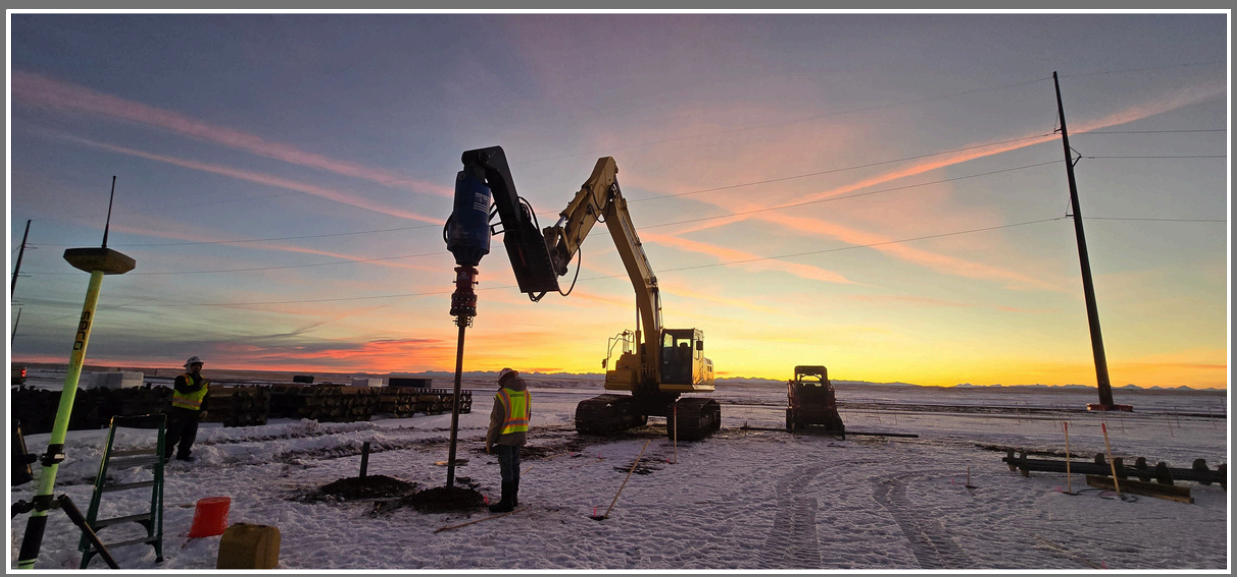
Chilling Precision

Remote Battery Station Perfectly Piered

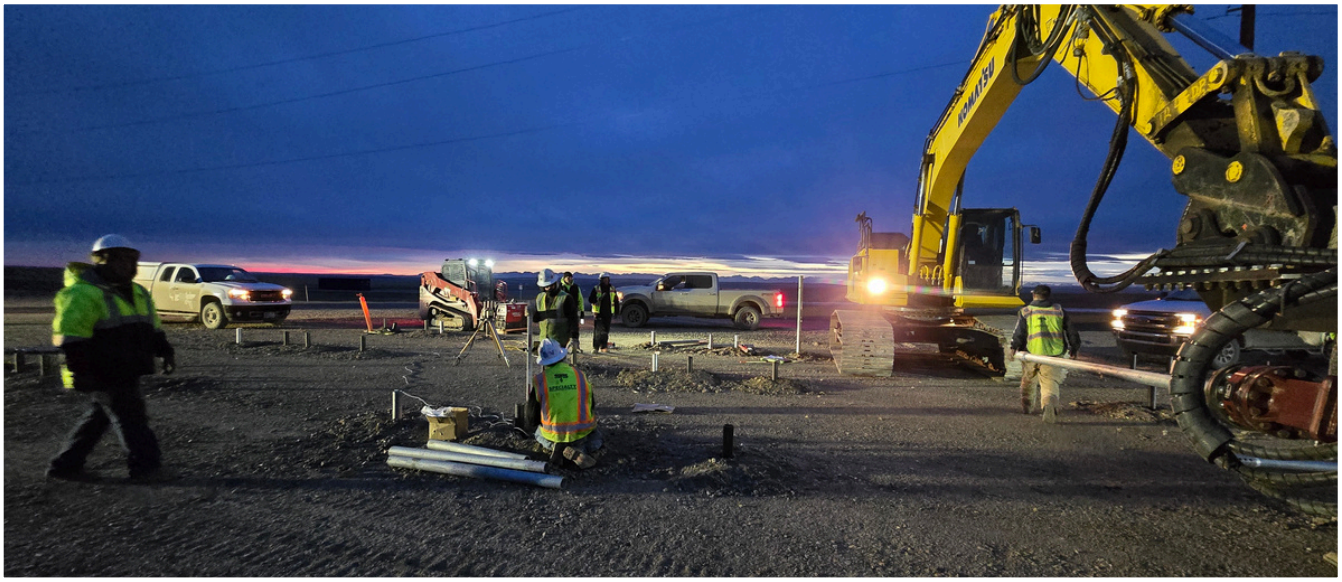
Etheridge, Montana

COMMERCIAL PROJECT OF THE YEAR FINALIST

Situated just outside of one of America's most stunning and iconic National Parks - Glacier National Park - an innovative energy project was constructed with sustainability and efficiency in mind. The development, a Battery Energy Storage System (BESS), was strategically built to serve a critical function in the area's energy infrastructure. Its primary purpose is to collect and store excess energy produced by nearby wind farms during "surplus hours" - times when the generation of wind power exceeds immediate demand. Later, during peak usage hours, the stored energy is redistributed to the grid, helping to stabilize energy supply and reduce dependence on non-renewable resources.



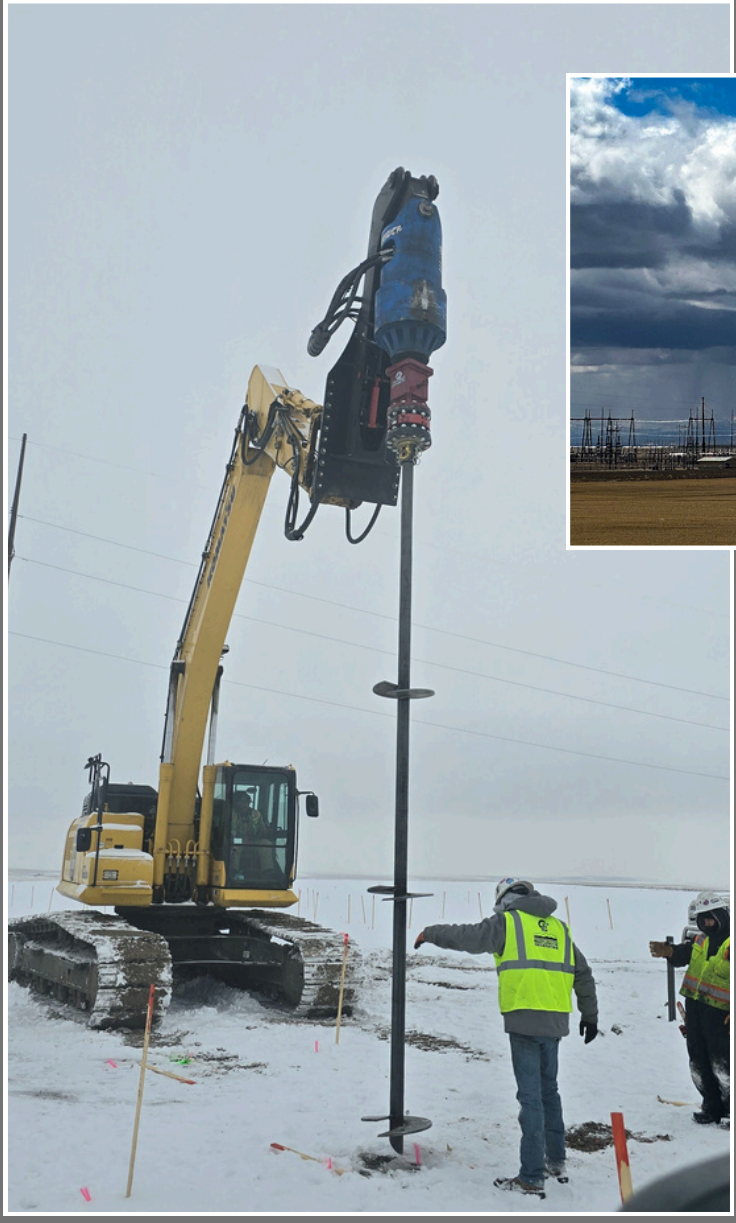
Given the remote location and environmental challenges associated with building in such a rugged and weather-prone area, the project designers spent considerable time and effort evaluating various foundation options. Ultimately, they selected helical piles as the most effective foundation solution for the site. Several critical factors influenced this decision, including the difficulty and high cost of transporting and pouring concrete in such a remote region, the need to work within an aggressive project timeline, and the unpredictable, often extreme weather conditions.

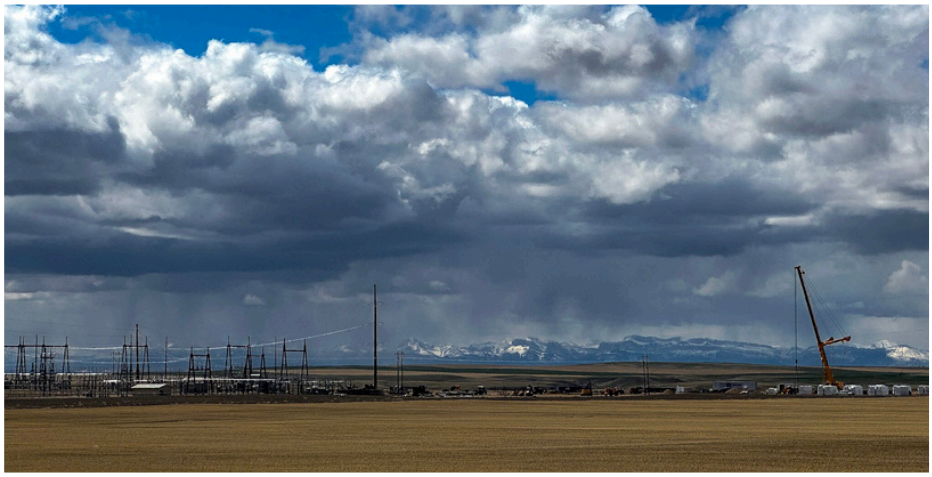


Additionally, the substantial weight of the battery units, combined with the site's marginal existing soil strength, made traditional foundation methods less viable. Helical piles offered a quick, stable, and cost-effective alternative. In total, Specialty Foundation Systems (SFS) installed 350 triple 18" helix piles, each 3.5 inches in diameter and 15 feet in length, to support 43 Tesla Mega Pack 2XL batteries and 22 electrical transformers. Thanks to efficient planning and execution, SFS completed the work ahead of schedule, demonstrating exceptional coordination and technical expertise.

Extreme Weather Conditions

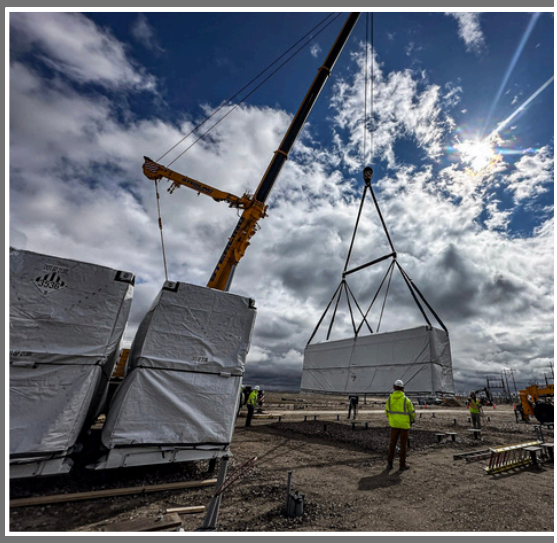
Northern Montana's weather is known for its unpredictability, and this project was no exception. SFS crews worked through the harsh winter of 2024-2025 to install the foundation piles. Conditions were often severe, with temperatures occasionally plummeting to a dangerous negative 40 degrees Fahrenheit, forcing a complete halt to operations for safety. Even on typical days, the average temperatures ranged from 10 to 30 degrees Fahrenheit, which, while less extreme, still posed significant challenges to productivity and worker comfort.





To manage the extreme weather conditions, SFS crews adjusted their work routines by shortening workdays and taking frequent breaks to warm their hands and feet. These adjustments ensured safety and productivity, allowing the team to maintain consistent progress despite the harsh environment.

Tight Installation Tolerances
SFS was required to adhere to highly precise installation specifications. The project demanded a maximum vertical deviation of only 3/8ths of an inch and a horizontal tolerance of just 3 inches. Maintaining this level of accuracy under difficult field conditions required meticulous planning, advanced equipment, and highly skilled crews.



Faced with tight installation requirements, the SFS team adopted a “slow and steady wins the race” approach. To meet the strict vertical tolerance, each pile was driven to the required torque, then carefully cut and ground to the correct elevation. Each battery consisted of a 10-pile layout, and to ensure a level installation, the team used a combination of laser levels, GPS surveying, and a custom battery template. For horizontal alignment, SFS engineered a custom guide mounted to a skid steer, which helped prevent pile ‘walking’ during the initial driving phase. Once the piles were set into the ground, the team transitioned to the tried and true string line and plumb bob method for final alignment. There were no shortcuts - every pile was placed with precision. The result met all specifications, and the client was very pleased with the final product.