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Introduction to MacLean Power Systems' Excalibur Displacement and Pressure Grouted Piles

MacLean Power Systems (MPS) offers a full product line of pressure grouted and displacement piles for high capacity deep foundation applications. These products have been safely and effectively used in a wide range of applications traditionally occupied by micropiles, augercast piles, driven piles, and similar foundation technologies.

The MPS Excalibur Displacement Pile (EDP) system offers the advantages of Displacement Piles with greater load support than other commonly available systems. EDP's can be safely and effectively installed in areas with limited access where specialized equipment for other deep foundation systems may be required and become less economical. Overhead access, limited site availability, low disturbance installations, shorter overall pile lengths, and projects requiring less grout/concrete are all situations where the EDP can be a valuable tool for your project.

By taking advantage of EDP's long lead and extension section lengths (up to 40') you can drastically reduce the pile's cost per foot (cost per kip). Reducing the number of pile sections/joints also brings down the overall material handling and jobsite labor hours. These advantages make MacLean EDP's an economic solution to many deep foundation applications.

EDP's can be utilized in a wide variety of soil conditions. They are fabricated of high strength steel and can withstand large amounts of torsional forces, enabling them to penetrate through tough, dense soils. By increasing the number and size of drive plates or incorporating a grout column in the pile design, EDP's can generate tremendous axial and lateral resistances even in poor, low consistency soil conditions.

Regardless of your project's specific requirements, the representatives/engineers at MPS will work with you to provide an economical deep foundation solution to fit your needs.

Key Components

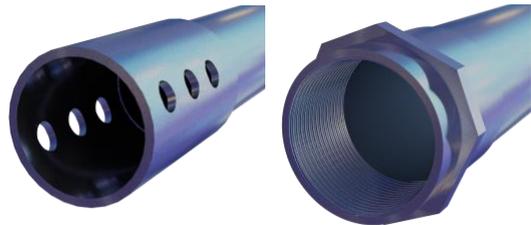
Steel Shaft

Stocked pile shafts are listed below. Sizes may be selected based on many factors including axial and lateral loading requirements, site and overhead access, among others. All shafts are made of high-grade alloy steel to support the large loads. Each section can be coupled together in the field with ease to reach the required installation depth/torque.



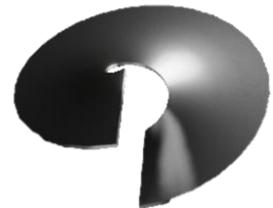
Couplers

MPS offers a full range of traditional bolted as well as internally threaded coupler systems. Both systems have been safely and effectively used in pressure grouted and non-grouted applications. The threaded system eliminates the excess handling of hardware and can significantly decrease the overall installation time.



Pile Driver Plate(s)

These plates range from 8" to 30" and 1/2" to 3/4" thick with a 6" pitch, consult for custom options. The drive plate(s) are used to aid in the advancement of the pile through the soil and as end bearing elements. For pressure grouted piles, they are used to displace the soil around the pile and create an annulus for which the grout column to be formed. They do not auger the soil.



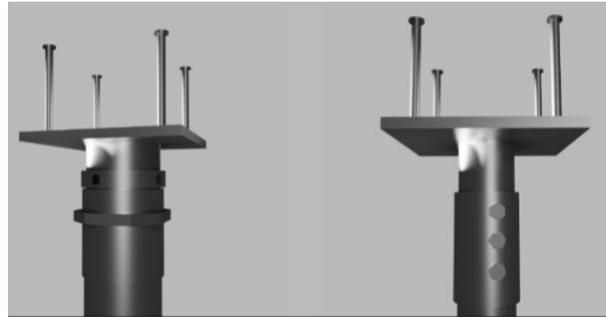
Grout

For pressure grouted EDP's, a grout column is shown below. A neat grout mix of Portland Cement and potable water may be used. Once the pile driver plate is in full contact with the ground, pressure grouting can begin and should continue as the pile is advanced through the soil. As the driver plate displaces the soil, the grout fills the void created and forms a column around the central steel shaft. Grout flow and delivery pressure should be monitored to ensure proper grout distribution is being achieved.



Terminations

MPS offers a wide range of pile terminations to fit your project's needs. We can provide traditional bolted square terminations, adjustable threaded terminations for both bolted and threaded style couplers, as well provide terminations with nelson studs for improved shear transfer from the superstructure's concrete foundation to the piles.



Applications

The EDP has been used successfully in traditional Displacement Pile applications. It is a proven economical solution in the below job types where axial loads exceed the capacities of traditional piles. The larger cross-sectional area and higher-grade steel of the EDP offers much higher lateral and moment capacities along with minimal pile head deflection as compared to traditional Displacement Piles. These benefits, in conjunction with EDP's efficient installation, make it an ideal deep foundation solution.

Areas with and without overhead restrictions:



Bridge abutments:



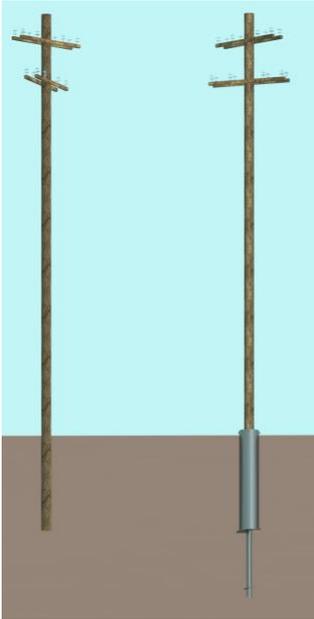
Transmission tower and monopile pile groups:



Grouted piles being installed to support large storage tanks:



Bucket Pile for support of direct bury wooden poles:



New build foundation construction:



Oil and gas pipe racks and tank support:



For more information on the products shown here please visit
macleancivilproducts.com/product/high-capacity