

Summary chart

Pile type	Approximate cost	Advantages	Disadvantages	Best use	Typical loads
<p>Helical piers</p>	<p>For a 20 ft shaft loaded to 30 kips, remedial work, \$500 to \$2000 per pier depending on location and local labor cost.</p> <p>Average cost from a survey of many installers around the county is about \$1200 - \$1400 for remedial.</p>	<ul style="list-style-type: none"> • Predictable loading • Not affected by expansive soil • Direct load capacity feedback • No cleanup • No vibration • Fast installation • Small crew • Immediate load • Useful in either remedial or new construction • Reusable • Low mobilization costs • Year around installation • Equally effective in tension or compression • Least disturbing to soil of all methods 	<ul style="list-style-type: none"> • Sensitive to buckling loads if the joint is not stiff. • Difficult to get next to the foundation with a large torque head. 	<ul style="list-style-type: none"> • Useful in either remedial or new construction 	<ul style="list-style-type: none"> • up to 50 tons in tension or compression • up to 80 kips.

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Cable lock piers	<ul style="list-style-type: none"> • Less than helical piers or push piers because of low cost material 	<ul style="list-style-type: none"> • No cleanup • No vibration • Immediate load • Direct load capacity feedback • Fast installation • Small crew • Cheap raw material 	<ul style="list-style-type: none"> • Sensitive to expansive soil • Won't work for lightly loaded structures- must have a heavy reaction mass to push pier down. 	<ul style="list-style-type: none"> • Remedial repairs and restricted clearances 	<ul style="list-style-type: none"> • Same as helical piers
Hydraulic push piers	<ul style="list-style-type: none"> • Less than helical piers because of no welded helices. 	<ul style="list-style-type: none"> • Predictable loading • Direct load capacity feedback • No cleanup • No vibration • Fast installation • Small crew • Immediate load • Useful in either remedial or new construction 	<ul style="list-style-type: none"> • Very sensitive to expansive soil • Won't work for lightly loaded structures- must have a heavy reaction mass to push pier down • They can stress the foundation severely as they push, causing more cracking, especially if no rebar was in the concrete. 	<ul style="list-style-type: none"> • Remedial repairs and restricted clearances 	<ul style="list-style-type: none"> • Up to 50 tons for 3 ½" tubes

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Micropiles	No information	<ul style="list-style-type: none"> • Can be used in restricted areas • Can be used in weak soil due to compacting action. • Resistive friction forces are larger because of larger dia 	<ul style="list-style-type: none"> • Sensitive to expansive soil because of large wall friction. • Must wait until grout dries to apply load • Cannot measure load carrying ability immediately after install 	<ul style="list-style-type: none"> • Deep foundations where conventional elements cannot be used due to space or equipment limitations. 	<ul style="list-style-type: none"> • 60 to 80 tons but can range from 3 to 500 tons, depending on size
Helical Pull Down micropiles (HPM)	No information	<ul style="list-style-type: none"> • Many of the advantages of standard helical piers 	<ul style="list-style-type: none"> • Grout is needed which makes installation messy, increases wait time to several weeks to apply a load. • Cannot measure load carrying ability immediately after install 	<ul style="list-style-type: none"> • Moderate foundations where soil is relatively firm 	<ul style="list-style-type: none"> • About the same as helical piers
Auger cast piles	No information	<ul style="list-style-type: none"> • No casing needed • Low noise • Low vibration • Removed soil can be inspected 	<ul style="list-style-type: none"> • High mobilization costs • Difficult to drop rebar to the hole bottom because of cave-ins 	<ul style="list-style-type: none"> • Moderate to deep foundations 	50 to 100 tons

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Driven piles	<ul style="list-style-type: none"> • \$125/ft for 50 ft depth for a West Virginia bridge 	<ul style="list-style-type: none"> • Can carry very heavy loads • Immediately verifiable load capacity • Can use steel, concrete, or wood • Little cleanup • The fastest deep foundation • Can be installed on very steep slopes such as mountain roads 	<ul style="list-style-type: none"> • Intense pounding and vibration in soil. • Large installation equipment. • Large crew needed • High mobilization costs 	<ul style="list-style-type: none"> • Deep foundations 	<ul style="list-style-type: none"> • Up to 3000 tons (Caltrans report) • 25 to 1000 tons most common
Concrete pile caissons	<ul style="list-style-type: none"> • Denver \$5/lineal ft. Elsewhere \$18/lineal ft • Three times the helical pier cost (from an upper Midwest installer) 	<ul style="list-style-type: none"> • Many installers familiar with the process • Reliable performance over time 	<ul style="list-style-type: none"> • Messy • Must wait 2-4 weeks until concrete is dry to apply load • Rebar cages needed • Large crew needed • High mobilization costs 	<ul style="list-style-type: none"> • Deep foundations 	<ul style="list-style-type: none"> • 25 to 1000 tons most common depending on diameter