

Making the proper choice of CHANCE[®] helical screw foundation and anchor

Should it be **Round Pipe** OR **Square Shaft** ?

This table compares technical factors related to installation and performance data.

Other key factors to consider are: •Application •Site conditions •Customer perception

How the product is used and the project soils are the two constraints that should decide which shaft type is optimum. Customer perception may not be related to proper engineering design, but can be the major factor in what shaft type to use.

Round Pipe vs. Square Shaft Helical Screw Foundations and Anchors

Feature	Round Pipe	Square Shaft
• Installation torque related to ultimate bearing capacity	Less bearing capacity for a given installation torque	More bearing capacity for a given installation torque
• Shaft twist	Not obvious without other means of visual reference	Visibly obvious —good indicator of torque
• Installation energy (work)	More: Larger cross section and increased friction due to round shape	Less: Smaller cross section and less friction due to square shape
• Total Load Capacity	End bearing and skin friction (dia. >3")	End bearing only
• Soil disturbance	More: Larger shaft-diameter to helix-diameter ratio, i.e. more disruption and pore pressure build up	Less: Smaller shaft-diameter to helix-diameter ratio, i.e. less disruption and pore pressure build up
• Center-to-center spacing	Must be spaced farther apart due to increased pore pressure build up	Can be spaced closer together due to less pore pressure build up
• Soil penetration	Larger cross section reduces penetration into soils with higher Standard Penetration Test N values	<ul style="list-style-type: none"> •For a given torque, will penetrate farther into a given bearing strata •Will penetrate soils with higher Standard Penetration Test N values
• Couplings	<ul style="list-style-type: none"> •Multiple bolts are more difficult to connect in the field •Coupling bolts must resist both torque and axial load •Little slack in couplings applicable for load reversal applications 	<ul style="list-style-type: none"> •Single bolt is easy to connect in the field •Torque transfer across square shape, not coupling bolt •Slack in coupling not applicable for load reversal applications (without alterations)
• Shaft bending resistance	More: Larger shaft size results in larger section properties	Less: Slender shaft results in smaller section properties
• Shaft buckling resistance	Critical buckling load is more for a given soil due to larger shaft size	Critical buckling load is less for a given soil due to slender shaft (practical concern in only the softest soils)
• Lateral shear capacity	Larger shaft size results in more lateral capacity for a given soil	Slender shaft results in less lateral capacity for a given soil
• Column/shaft above grade	Better: Larger shaft has greater stiffness	Limited: Slender shaft has less stiffness
• Corrosion loss potential	More: Hollow pipe shaft means more surface area (both inside and out) exposed to corrosive environments	Less: Solid slender shaft means less surface area exposed to corrosive environments
• Ground water migration	More: Larger cross section results in more disturbed soil acting as a water wick. Hollow shaft allows open conduit to surface water.	Less: Smaller cross section and solid shaft results in less disturbed soil acting as a water wick

When to use

Round
Pipe

OR

Square
Shaft

Deciding Factors: •Project application •Project Soils

The design of helical screw piles and anchors should be performed by an entity as required in accordance with existing local code requirements or established local practices: A licensed professional engineer, a certified A.B. Chance Co. Dealer, or designer – depending on local requirements or practices.



• Underpinning and Shoring

•Where soils immediately below the footing are capable of lateral support, square shaft provides required performance.

•Where soil strength immediately below the footing is low or unknown, a pipe shaft is a good choice, but the best solution is the HELICAL PULLDOWN™ Micropile or a Combo Pile (square shaft lead and pipe shaft extension at the surface).



• New Construction

Square shaft is the material of choice unless the vertically installed shaft is expected to resist significant lateral loads, or if the confining soils along the shaft are low strength. Solutions are HELICAL PULLDOWN™ Micropile, the Combo Pile, battered piles, or passive resistance on pile caps/grade beams.



• Earth Retention

Square shaft material. No exceptions.



- **Tiedowns**

Square shaft material. No exceptions.



- **Pipeline Hold-Up/Hold-Down and Sleepers**

Pipe shaft is the foundation of choice – either HS or Combo Pile.



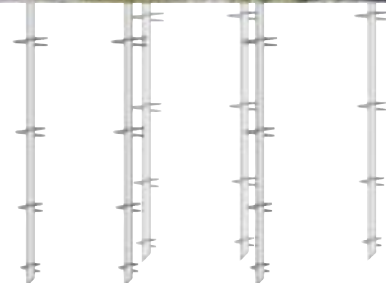
- **Pipeline Buoyancy Control**

Square shaft material. No exceptions.



- **Tower Foundations and Equipment Platforms**

Pipe shaft, Combo Pile or HELICAL PULLDOWN™ Micropile is the best choice due to lateral loads.



®



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NOTE: Because Hubbell has a policy of continuous product improvement, we reserve the right to change design and specifications without notice.

Hubbell Power Systems, Inc.

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