

CALIFORNIA TRENCHING AND SHORING MANUAL

TIEBACK TYPES BY PRESSURE

Summary of tieback types and applicable soil types.

Method	Diameter(inches) Shaft Type	Bell Type	Gravity Concrete	Grout Pressure (psi) (1)	Suitable Soils for Anchorage	Load Transfer Mechanism
1. LOW PRESSURE						
Straight Shaft Friction (Solid stem auger)	12-24" (30 - 60cm)	NA	A	NA	Very stiff to hard clays Dense cohesive sands	Friction
Straight Shaft Friction (Hollow stem auger)	6-18" (15 - 45cm) (12-14" most common)	NA	NA	30 - 150 (200 - 1035 kN/m2)	Very stiff to har clays Dense cohesive sands Loose to dense sands	Friction
Underreamed Single Bell at Bottom	12-18" (30 - 45cm)	30-42" (75 - 105cm)	A	NA	Very stiff to hard cohesive soils Dense cohesive sands Soft rock	Friction and bearing
Underreamed Multi- Bell	4-8" (10- 20cm)	8-24" (20- 60cm)	A	NA	Very stiff to hard cohesive soils Dense cohesive sands Soft rock	Friction and bearing
2. HIGH PRESSURE- SMALL DIAMETER						
Non-regroutable (2)	3-8" (7.5 - 20cm)	NA	NA	150 (1035 kN/m2)	Hard clays Sands Sand gravel form- ations Glacial till or hardpan	Friction or friction and bearing in permeable soils
Regroutable (3)	3-8" (7.5 - 20cm)	NA	NA	200-500 (1380 - 3450 kN/m2)	Same as for non- regroutable anchors plus: a) stiff to very stiff clay b) varied and difficult soils	Friction and bearing

(1) Grout pressures are typical

(2) Friction from compacted zone having locked in stress.

Mass penetration of grout in highly pervious sand/gravel forms
"bulb anchor".

(3) Local penetration of grout will form bulbs which act in bear-
ing or increase effective anchor diameter.

A - applicable

NA - not applicable