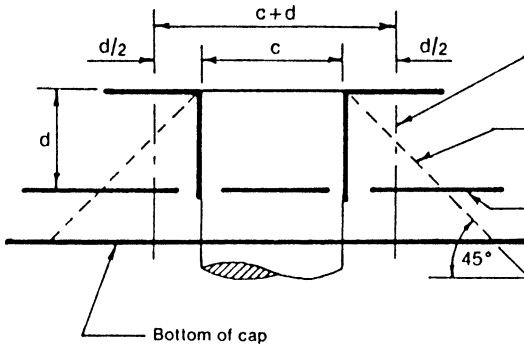
SUGGESTED CONCRETE DESIGN PROCEDURES

Analysis by the Portland Cement Association for the development of connector design value in pullout strength in concrete cap.



Critical section assumed by ACI code, section 1207.

Plane of failure assumed when cone is pulled out of concrete.

Bottom re-bars in concrete cap.

NOTE: In addition to shear in plain concrete, stirrups or other re-inforcing may be used to develop pull-out strength.

EXAMPLE: Given:

V = 9,214# (allowable uplift load for 2 connector plates to pile)
d = 7-1/2" c = 10-1/2"
b_o = o (c + d) 1/2
= 3.14 x 18 x 0.5 = 28.2"

$V_c = \frac{V}{b_o d}$ = unit shear stress in concrete

V = total load
d = depth to reinforcing steel
c = pile diameter

Solve:

$$V_c = \frac{V}{b_o d} = \frac{9{,}214}{28.2 \times 7.5} = 43.6 \text{ psi}$$

V_c = allowable for concrete
= 100 psi.

b_o = o (c + d) = circumference at critical section

NOTE ABOUT b_o: Where only two plates are used, b_o might be assumed to be equivalent to one half a full circumference, or some other fraction thereof. The quantity b_o should be established through experience and engineering judgment.