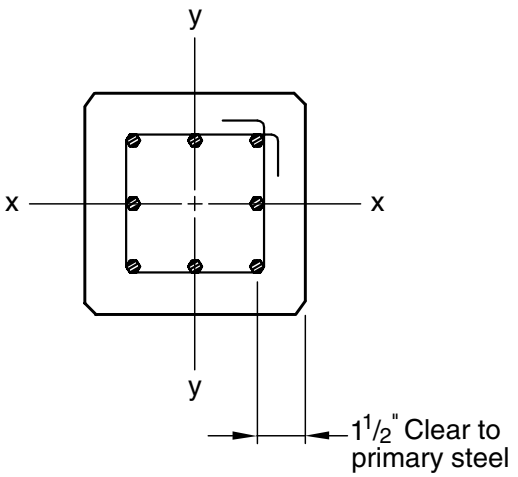
Design Aid 3.12.2. Design Strength Interaction Curves for Precast, Reinforced Concrete Columns

CRITERIA

1. Concrete f'_c = 5000 psi, normalweight
2. Reinforcement f_y = 60,000 psi
3. Curves shown for full development of reinforcement
4. Horizontal portion of curve is the maximum for tied columns = $0.80\phi P_O$
5. Varies linearly from 0.9 for tension-controlled sections to 0.65 for compression-controlled sections in accordance with ACI 318-05 Section 9.3.2

USE OF CURVES

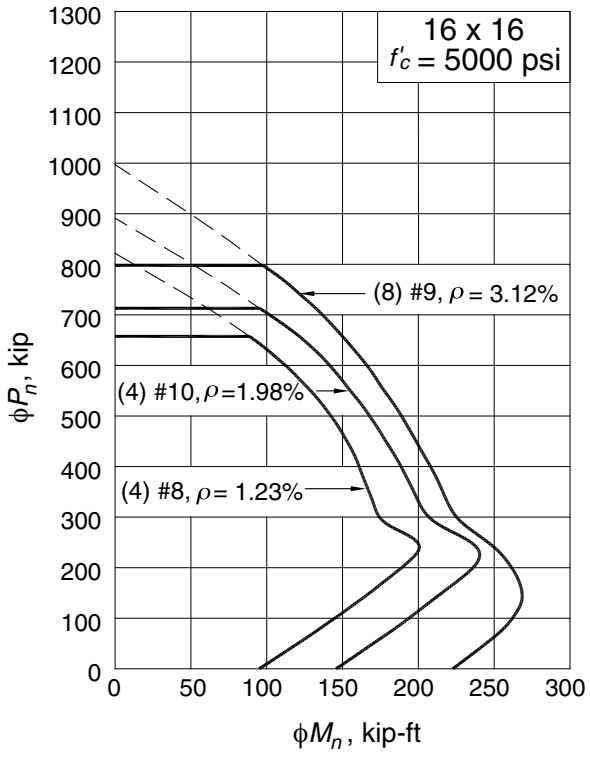
1. Enter at left with applied factored axial load P_u
2. Enter at bottom with applied magnified factored moment δM_u
3. Intersection point must be to the left of curve indicating required reinforcement.

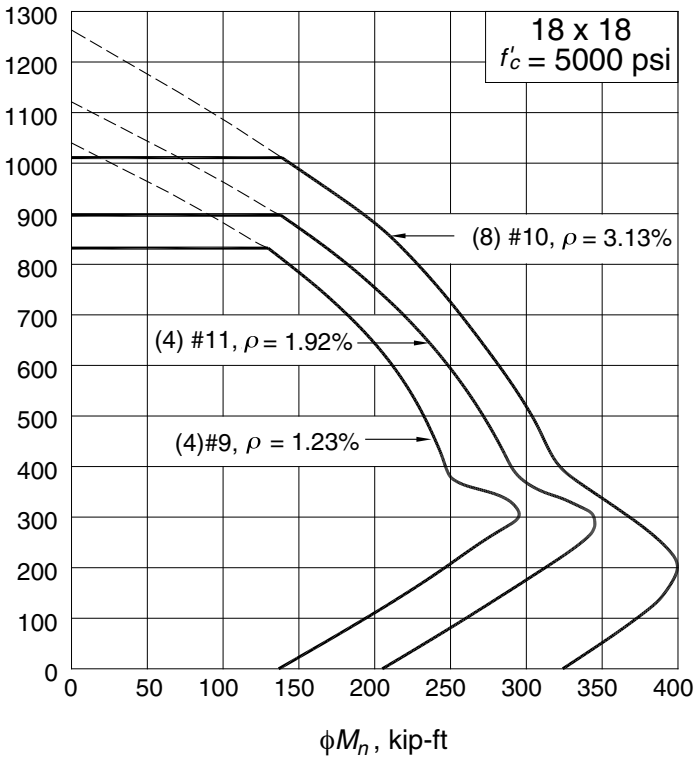


NOTATION

ϕP_n = design axial strength
ϕM_n = design flexural strength
ϕP_O = design axial strength at zero eccentricity
A_g = gross area of the column
δ = moment magnifier (ACI 318-05, Section 10.11–10.13)

The interaction curves have been smoothed for plotting purposes. Exact calculated values may be slightly different.





Design Aid 3.12.2 Design Strength Interaction Curves for Precast, Reinforced Concrete Columns (cont.)