PRECAST, REINFORCED COLUMNS

Fig. 2.6.2 Design strength interaction curves for precast, reinforced concrete columns

Criteria
1. Concrete $f'_c = 5000$ psi
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 $= 0.80\phi P_n$.
5. $\phi = 0.9$ for $\phi P_n = 0$
   $\phi = 0.7$ for $\phi P_n \geq 0.10 f'_c A_g$
   Varies from 0.9 to 0.7 for points between

Use of curves
1. Enter at left with applied factored axial load $P_u$
2. Enter at bottom with applied magnified factored moment, $\delta M_u$
3. Intersection point must be to the left of curve indicating required reinforcement.

Notation
$\phi P_n$ = Design axial strength
$\phi M_n$ = Design flexural strength
$\phi P_o$ = Design axial strength at zero eccentricity
$A_g$ = Gross area of the column
$\delta$ = Moment magnifier (Sect. 10.11, ACI 318-77)