PRECAST, PRESTRESSED COLUMNS

Figure 2.7.1  Design strength interaction curves for precast, prestressed concrete columns

CRITERIA
1. Minimum prestress = 225 psi
2. All strand assumed ½ in. diameter, \( f_{pu} = 270 \) ksi
3. Curves shown for partial development of strand near member end where \( f_{pu} \approx f_{se} \)
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 section to 0.65 for compression-controlled sections in accordance with ACI 318-02 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, \( \delta M_u \)
3. Intersection point must be to the left of curve indicating required concrete strength.

NOTATION
- \( \phi P_n \) = Design axial strength
- \( \phi M_n \) = Design flexural strength
- \( \phi P_c \) = Design axial strength at zero eccentricity
- \( A_g \) = Gross area of column
- \( \delta \) = Moment magnifier (Section 10.11–10.13 ACI 318-02)