

PRECAST, PRESTRESSED COLUMNS

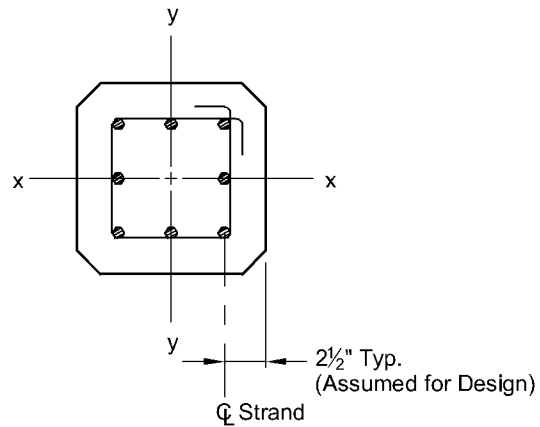
Figure 2.7.1 Design strength interaction curves for precast, prestressed concrete columns

CRITERIA

1. Minimum prestress = 225 psi
2. All strand assumed 1/2 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 = $0.80\phi P_c$
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, δM_u
3. Intersection point must be to the left of curve indicating required concrete strength.



NOTATION

- ϕP_n = Design axial strength
- ϕM_n = Design flexural strength
- ϕP_c = Design axial strength at zero eccentricity
- A_g = Gross area of column
- δ = Moment magnifier (Section 10.11–10.13 ACI 318-02)

