PROCEDURE OF

CIRCULAR BRACED(NONSWAY) LONG COULMN

REFERENCES	STEP	DESCRIPTION	DESIGN AID
ACI 318-89	Given:	Pu , Mu , $fc`$, fy	
	Required :	Design along braced column.	
	1-Calculate the Area	» Assume: D $Ag=\frac{\pi(D)^2}{4}$	
(10.11.4.1) (10.11.5.1)	2-Calculate the Slenderness Ratio $\frac{Klu}{r}$	»If $\frac{Klu}{r} \le 34-12\frac{M1}{M2} \Rightarrow$ (Short Braced Column) » If $\frac{Klu}{r} \ge 34-12\frac{M1}{M2} \Rightarrow$ (Long Braced Column)	
	3- Calculate Mu& δ_{ns} to find $M_{(des)}$ 3-1)Calculate $M_{2(min)}$, take the larg of $M_{2(min)}$ and M_u	» $M_{2(min)} = P_u[15+0.03h]$ »$M_{(des)} = Mu$	
Eq. (10-7) Eq. (10-12) Eq. (9-2) Eq. (10-11) Eq. (10-9)	4-Calculate δ_{ns} 4-1 Calculate Cm 4-2 Calculate βd 4-3 Calculate EI*eff* 4-4 Calculate *Pcr*	$\delta ns = \frac{Cm}{1-\left(\frac{Pu}{0.75Pcr}\right)}$ • $Cm = 0.6+0.4\frac{M1}{M2} > 0.4$ • $\beta d = \frac{1.4P_D}{1.4P_D+1.7P_L}$ • $EIeff = \frac{EcIg}{2.5(1+\beta d)}$ • $P_{cr} = \frac{\pi^2(EI)eff}{(Klu)^2}$	
	5-1 Calculate γh	$\gamma = \frac{h-2.cv-2.st-\phi bar}{h}$	

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	5-2: Calculate $\frac{\phi Pn}{Ag}$ 5-3: calculate $\frac{\phi Mn}{Ag * h}$ 5-4: Find ρ	$\frac{\phi Pn}{Ag}=\frac{Pu}{Ag}$ $\frac{\phi Mn}{Ag * h}=\frac{\delta ns * Mn}{Ag * h}$ From interaction Diagram	Column from 1to 20
	5. Calculate Ag	Ag= $\frac{\rho\pi(d)^2}{4}$	