

**Circular Stem Design - For Use in Spread Footings with Circular Stem**

$f_c =$	3.00	ksi	
$f_y =$	60	ksi	
$c_c =$	2.00	in	Clear cover is uniform around the cross section
$h =$	36.00	in	Outside Diameter of Column (Approx. 70" max)
Bar Size =	5		$A_s =$ 0.31 in <sup>2</sup>
			Dia = 0.625 in
Hoop Bar size =	4		$A_s =$ 0.2 in <sup>2</sup>
Spacing =	3.75	in	Approximate desired spacing of main reinforcing (assumes as max)
$\phi =$	1		

**Determine if section is adequate for loads applied**

$M_u =$	139.19	ft-kips	$M_u =$ Resultant moment = $\sqrt{(M_{strong}^2 + M_{weak}^2)}$
$P_u =$	3.95	kips	<b>IS SECTION OK? YES</b>

**Calculate location of steel reinforcing around perimeter of column:**

Dia. of inner ring of reinf. =	30.375 in
perimeter =	95.43 in
# of bars =	26 number of (even) bars that will fit in perimeter (Program allows 42 bars maximum) OK
Number of bar rows =	13
spacing =	2.53 (in) actual vertical spacing of bars

Note: Program orients bars so that one layer is on the centroid of column (conservative)

**Calculate location of bars with respect to the extreme compression fiber:**

Rebar level	level in	Is steel used for Tension or Comp.?	# bars in each level	Area of Steel Calculation	As tension	As comp
d1	2.81 in	Comp	2			0.62
d2	5.34 in	Comp	2			0.62
d3	7.88 in	Comp	2			0.62
d4	10.41 in	Comp	2			0.62
d5	12.94 in	Comp	2			0.62
d6	15.47 in	Comp	2			0.62
d7	18.00 in	Steel Not Used	2			
d8	20.53 in	Tension	2	0.62		
d9	23.06 in	Tension	2	0.62		
d10	25.59 in	Tension	2	0.62		
d11	28.13 in	Tension	2	0.62		
d12	30.66 in	Tension	2	0.62		
d13	33.19 in	Tension	2	0.62		
d14	NA					
d15	NA					
d16	NA					
d17	NA					
				As tens =	3.72	As comp = 3.72

Centroid of Tension and Compression Steel from extreme compression fiber:  
 $d(tension) =$  26.86 in  
 $d(comp) =$  9.14 in