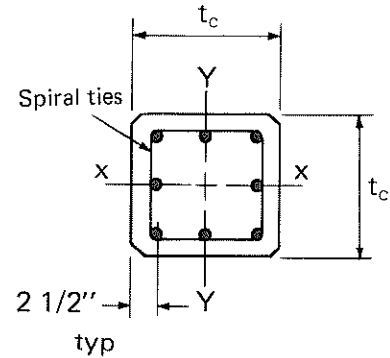


COLUMNS

Table 3.4.2 Ultimate capacity of prestressed concrete columns

$f'_c = 5000 \text{ psi}$

- P_U = design (ultimate) axial load, kips
- P_{U0} = design concentric axial load ($M_U = 0$), kips
- M_U = design (ultimate) moment about x or y axis, ft-kips
- e = M_U/P_U
- ϕ = 0.70 when $M_U = 0$ to max. value of M_U
0.90 when $P_U = 0$
other values interpolated between 0.70 and 0.90
- f'_c = 5000 psi
- f_{pu} = 270,000 psi (1/2" dia. strand)
250,000 psi (7/16" dia. strand)



2 1/2" typ
Strand located 2 1/2" from face to facilitate spiral placement

Allowable M_U beyond 50 diameters from end

10" x 10" Column

Strand	P_{U0}	$e = 0.1 t_c$		P_U														
		P_U	M_U	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140
4 - 7/16	282	234	19	19	22	25	27	30	32	34	36	38	40	41	42	42	42	41
4 - 1/2	275	227	19	25	28	30	32	34	36	38	40	41	42	43	43	43	42	41
8 - 1/2	279	220	18	34	36	38	40	41	42	43	44	44	44	44	43	42	41	39
Strand				P_U														
				150	160	170	180	190	200	210	220	230	240	250	260	270	280	
4 - 7/16				40	39	37	35	32	30	27	24	21	17*	14*	10*	6*	1*	
4 - 1/2				39	37	35	33	30	27	24	21	18*	15*	11*	7*	3*		
8 - 1/2				37	35	32	30	27	24	21	18	15*	13*	10*	7*	3*		

12" x 12" Column

Strand	P_{U0}	$e = 0.1 t_c$		P_U														
		P_U	M_U	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140
4 - 7/16	411	344	34	25	29	33	36	40	43	47	50	53	56	59	61	64	66	68
4 - 1/2	402	335	34	34	38	41	44	48	51	54	57	59	62	64	66	68	70	71
8 - 1/2	394	318	32	52	55	57	60	62	65	67	69	71	72	73	75	75	76	76
Strand				P_U														
				150	160	170	180	200	220	240	260	280	300	320	340	360	380	400
4 - 7/16				69	71	71	72	72	70	67	63	57	51	44	36	27*	18*	7*
4 - 1/2				72	73	73	73	72	70	65	60	54	47	40	32*	23*	13*	2*
8 - 1/2				76	75	74	73	70	66	60	54	47	39	31*	23*	14*	6*	

14" x 14" Column

Strand	P_{U0}	$e = 0.1 t_c$		P_U														
		P_U	M_U	0	10	20	40	60	80	100	120	140	160	180	200	220	240	260
4 - 7/16	565	475	55	30	35	40	50	58	67	75	83	90	96	102	107	110	113	114
4 - 1/2	555	465	54	43	48	52	60	69	76	84	91	97	103	108	111	114	115	116
8 - 1/2	539	443	52	70	73	77	84	91	97	103	108	112	115	118	119	119	118	115
Strand				P_U														
				280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
4 - 7/16				114	112	109	106	101	95	88	80	72	63	53*	43*	31*	19*	4*
4 - 1/2				114	112	108	104	98	91	83	75	66	57	47*	36*	24*	11*	
8 - 1/2				112	108	102	96	89	81	72	63	53	43*	32*	21*	10*		

* $e < 0.1 t_c$