CORESLAB STRUCTURES

PRECAST, REINFORCED COLUMNS

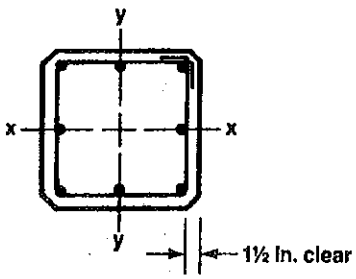
Design strength interaction curves for precast, reinforced concrete columns.

Criteria

1. Concrete f'_c = 5000 psi
2. Reinforcement f_y = 60,000 psi
3. Curves shown for full development of reinforcement
4. Horizontal portion of curve is the maximum for tied columns = $0.80\phi P_o$.
5. ϕ = 0.9 for $\phi P_n = 0$
   = 0.7 for $\phi P_n \geq 0.10\, f'_c A_g$
   Varies from 0.9 to 0.7 for points between

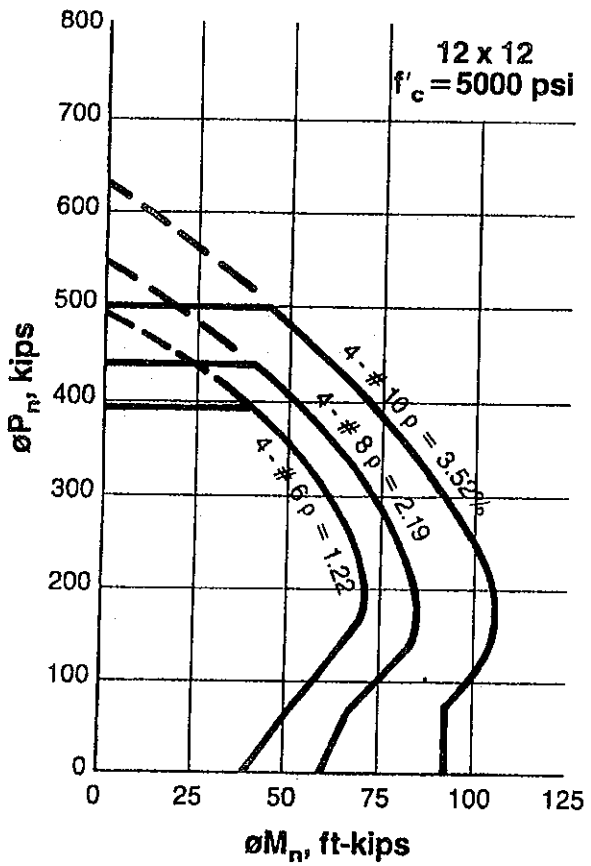
Use of curves

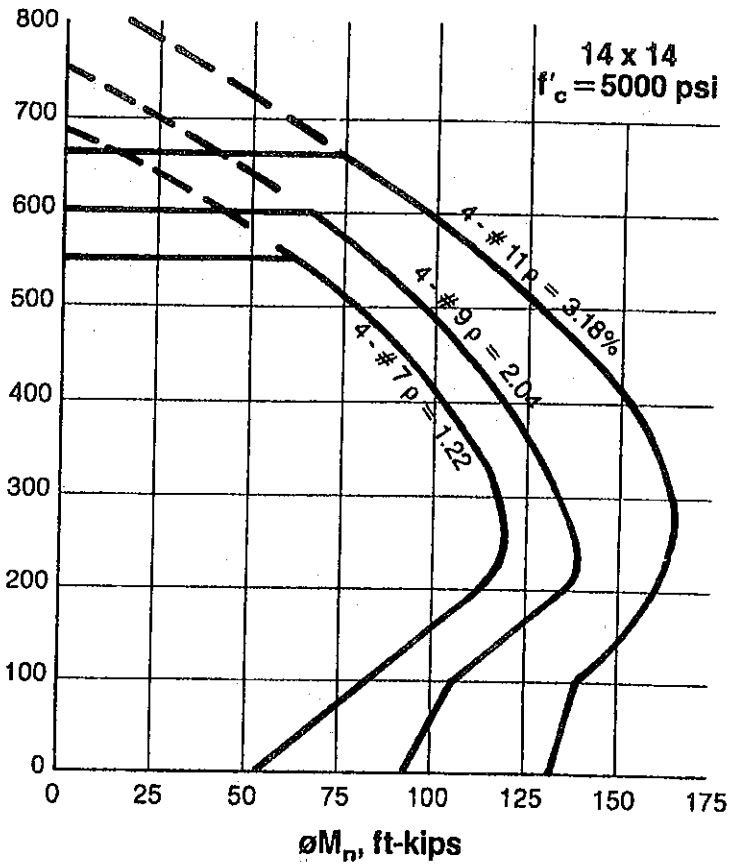
1. Enter at left with applied factored axial load, P_u
2. Enter at bottom with applied magnified factored moment, δM_u
3. Intersection point must be to the left of curve indicating required reinforcement.



Notation

ϕP_n = Design axial strength
ϕM_n = Design flexural strength
ϕP_o = Design axial strength at zero eccentricity
A_g = Gross area of the column
δ = Moment magnifier (Sect. 10.11, ACI 318-83)





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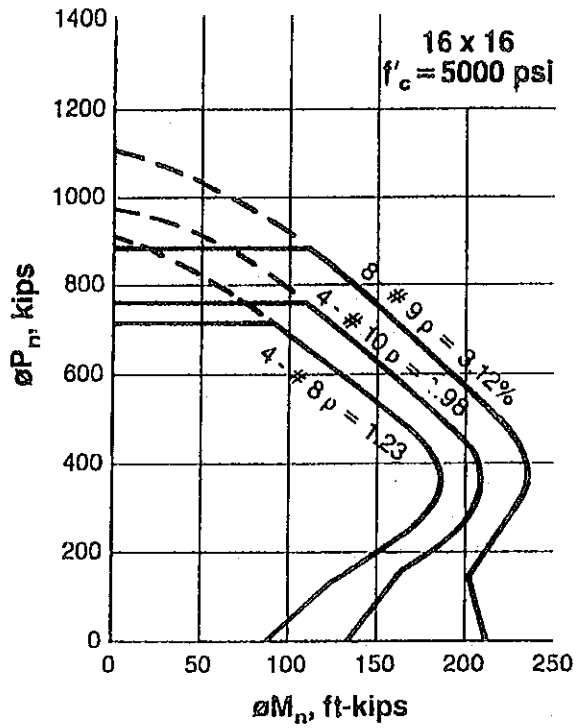
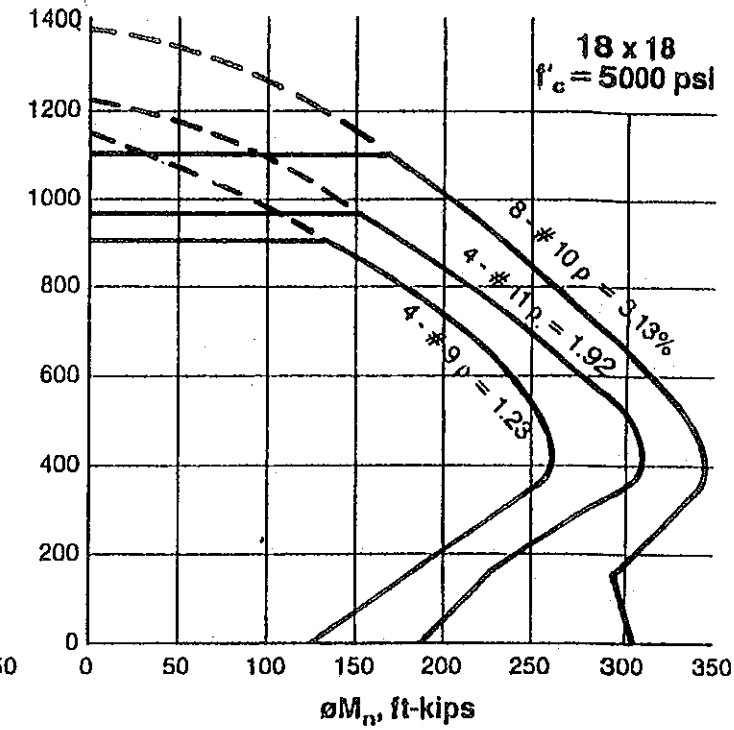
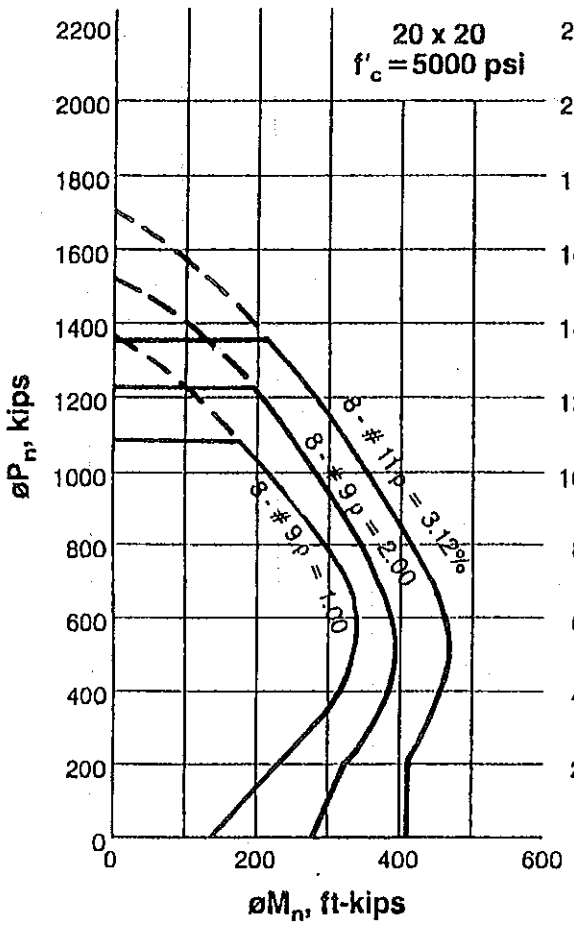
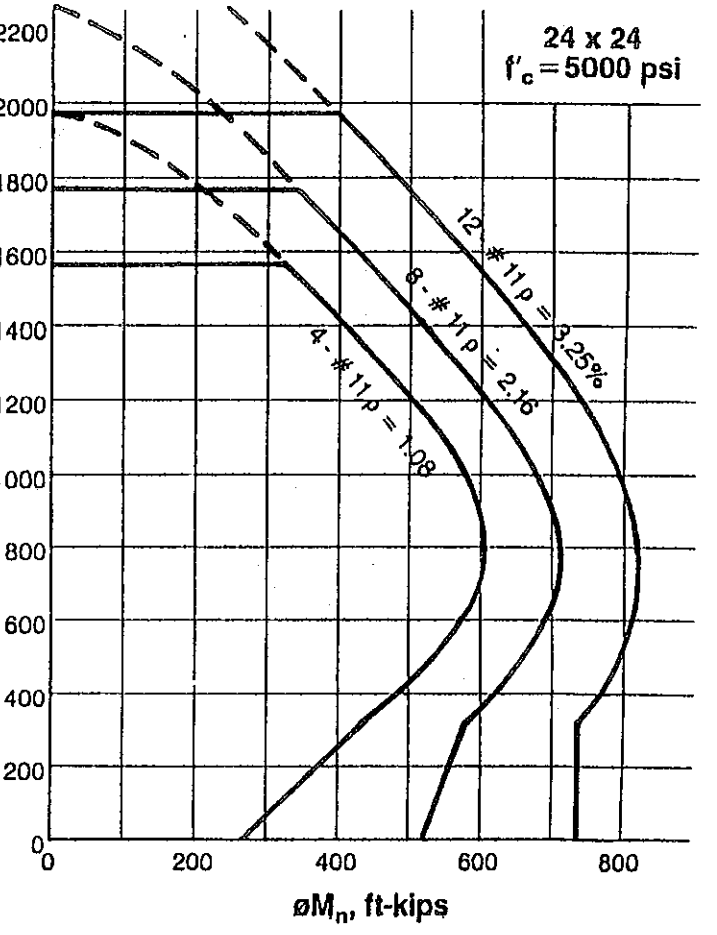


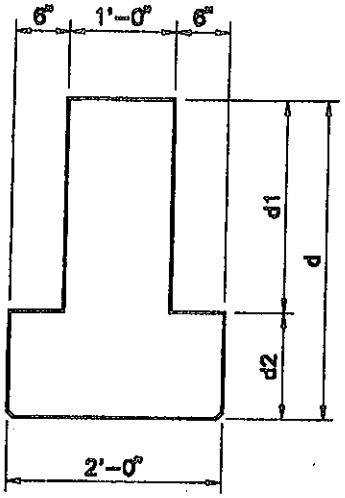






DOUBLE LEDGER BEAMS

CORESLAB STRUCTURES



Normal Weight Concrete

f'c = 5000 psi
fpu = 270,000 psi
Low Relaxation Strand

Safe loads shown include 50% dead load and 50% sustained loads.

Section Properties

Designation	d (in.)	d_1/d_2 (in.)	A (in^2)	I (in^4)	Y_b (in.)	S_b (in^3)	S_t (in^3)	wt (plf)
22ITB24	22	10/12	408	14705	9.24	1592	1152	425
26ITB24	26	14/12	456	24132	10.79	2237	1587	475
28ITB24	28	16/12	480	30131	11.60	2598	1837	500
36ITB24	36	24/12	576	63936	15.00	4262	3045	600
42ITB24	42	24/18	720	101693	17.40	5844	4133	750

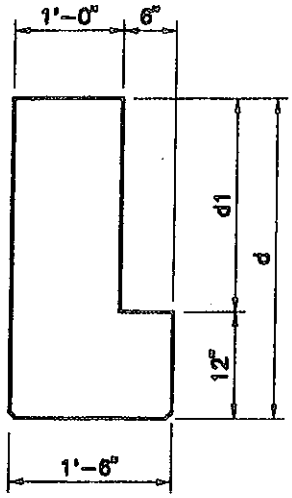
Table of safe superimposed load (plf)

Desig-nation	No. Strands	Span, ft.									
		24	26	28	30	32	34	36	38	40	42
22ITB24	8	2597	2157	1808	1524						
22ITB24	10	3061	2553	2149	1822	1556	1334	1149			
22ITB24	12	3412	2845	2395	2032	1735	1489	1282	1108		
26ITB24	10	4089	3422	2895	2463	2114	1825	1582	1376		
26ITB24	12	4660	3909	3311	2830	2435	2109	1835	1603	1405	
26ITB24	14	5012	4201	3557	3038	2613	2261	1966	1716	1503	1320
28ITB24	12	5278	4433	3761	3218	2772	2405	2098	1837	1613	1389
28ITB24	14	5849	4910	4166	3565	3073	2666	2324	2035	1789	1576
28ITB24	16			4218	3899	3113	2701	2356	2064	1814	1600
36ITB24	14			6313	5426	4705	4108	3607	3179	2817	2506
36ITB24	16			6874	5918	5133	4487	3945	3482	3092	2757
36ITB24	18			7304	6286	5453	4763	4184	3695	3276	2917
42ITB24	18				7884	6840	5985	5261	4656	4137	3690
42ITB24	20				8454	7341	6428	5662	5012	4459	3983

Ultimate strength based on strain compatibility: bottom tension limited to $7.5\sqrt{f'c}$.
For load conditions not covered by this table consult Coreslab engineering staff.

LEDGER BEAMS

CORESLAB STRUCTURES



Normal Weight Concrete

f'c = 5000 psi
fpu = 270,000 psi
Low Relaxation Strand

Section Properties

Designation	d_1 (in.)	d (in.)	A (in^2)	I (in^4)	Y_b (in.)	S_b (in^3)	S_t (in^3)	wt (plf)
18LB22	10	22	336	12929	9.929	1302	1071	350
18LB26	14	26	384	21307	11.69	1823	1489	400
18LB28	16	28	408	26611	12.59	2114	1727	425
18LB36	24	36	504	56407	16.29	3464	2861	525

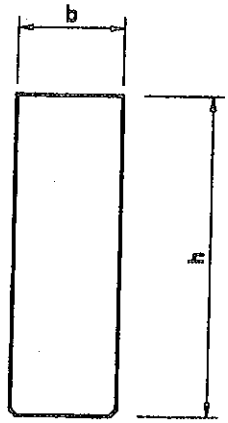
Table of safe superimposed load (plf)

BEAM TYPE	D_1	D	12	14	16	18	20	22	24	26	28	30	32	34	36	38
18LB22-68	10	22	7000	5050	3785	2917	2298	1839	1489	1218	1002					
18LB22-88	10	22	8840	6402	4819	3734	2962	2387	1950	1612	1341	1125	946			
18LB22-108	10	22	10604	7698	5812	4519	3594	2913	2391	1988	1666	1408	1195	1021		
18LB22-128	10	22	11975	8705	6583	5128	4087	3321	2735	2281	1919	1629	1389	1192	1027	
18LB26-88	14	26	11567	8392	6331	4919	3908	3160	2592	2149	1798	1515	1283	1091	930	
18LB26-108	14	26		10232	7662	5970	4760	3864	3183	2653	2232	1893	1615	1385	1192	1029
18LB26-128	14	26		11607	8793	6863	5483	4462	3686	3081	2602	2215	1898	1636	1416	1230
18LB26-148	14	26		12948	9820	7675	6141	5005	4142	3470	2937	2507	2155	1863	1619	1412
18LB28-108	16	28		11404	8632	6731	5371	4365	3600	3005	2532	2151	1839	1581	1364	1181
18LB28-128	16	28		13057	9897	7731	6181	5035	4163	3484	2946	2511	2156	1861	1614	1405
18LB28-148	16	28			11059	8649	6925	5649	4679	3924	3325	2842	2446	2118	1843	1611
18LB28-168	16	28					7626	6234	5175	4351	3697	3169	2737	2379	2079	1826
18LB36-108	24	36			12742	9958	7966	6492	5371	4499	3807	3249	2792	2413	2096	1827
18LB36-128	24	36			14551	11387	9124	7449	6176	5184	4398	3763	3244	2814	2453	2148
18LB36-148	24	36				12813	10279	8404	6977	5868	4987	4277	3695	3213	2809	2468
18LB36-168	24	36				14159	11369	9305	7735	6513	5543	4761	4121	3590	3146	2770

Ultimate strength based on strain compatibility: bottom tension limited to $7.5\sqrt{f'c}$.
For load conditions not covered by this table consult Coreslab engineering staff.

RECTANGULAR BEAMS

CORESLAB STRUCTURES



f'c = 5000 psi
fpu = 270,000 psi
Low Relaxation Strand

Normal Weight Concrete

Section Properties

Designation	b (in.)	h (in.)	A ($in.^2$)	I ($in.^4$)	Y_b (in.)	Z ($in.^3$)	wt (plf)
12RB16	12	16	192	4096	8.00	512	200
12RB20	12	20	240	8000	10.00	800	250
12RB24	12	24	288	13824	12.00	1152	300
12RB28	12	28	336	21952	14.00	1568	350
12RB32	12	32	384	32768	16.00	2048	400
12RB36	12	36	432	46656	18.00	2592	450
16RB24	16	24	384	18432	12.00	1536	400
16RB28	16	28	448	29269	14.00	2091	467
16RB32	16	32	512	43691	16.00	2731	533
16RB36	16	36	576	62208	18.00	3456	600

Safe loads shown include 50% dead load and 50% live load. 800 psi top tension has been allowed, therefore additional top reinforcement is required.

Table of safe superimposed service load (plf)

Desig-nation	No. Strand	Span, ft.																	
		16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50
12RB16	5	3246	2527	2012	1632	1342	1117												
12RB20	8	5816	4548	3641	2970	2459	2062	1747	1493	1285	1112								
12RB24	10	8585	6726	5397	4413	3665	3083	2621	2248	1940	1684	1470	1288	1133	1000				
12RB28	12		9074	7290	5970	4966	4184	3564	3064	2655	2316	2031	1791	1585	1409	1255	1122	1002	
12RB32	13			9584	7858	6545	5524	4713	4059	3524	3080	2708	2394	2125	1894	1694	1519	1365	1230
12RB36	15					8450	7140	6100	5261	4575	4006	3530	3123	2775	2475	2215	1989	1790	1614
16RB24	13		8847	7098	5803	4819	4052	3444	2954	2552	2220	1941	1705	1503	1330	1180			
16RB28	13			9720	7959	6621	5579	4752	4086	3540	3087	2708	2388	2114	1878	1674	1496	1335	1194
16RB32	18					8808	7434	6343	5464	4744	4147	3647	3224	2863	2549	2275	2036	1827	1642
16RB36	20						9519	8133	7015	6100	5342	4706	4165	3700	3300	2954	2651	2386	2152

Ultimate strength based on strain compatibility: bottom tension limited to 7.5 $\sqrt{f'c}$.
For load conditions not covered by this table consult Coreslab engineering staff.