

Table 3. Design Constants for Reinforced Rectangular Beam Sections

f'_c (psi)	$\left[\frac{3\sqrt{f'_c}}{f_y} \geq \frac{200}{f_y} \right]$	ρ_b	Recommended Design Values	
			ρ	R (psi)
$f_y = 40,000$ psi				
3000	0.0050	0.03712	0.0135	482.82
4000	0.0050	0.04949	0.0180	643.76
5000	0.0053	0.05823	0.0225	804.71
6000	0.0058	0.06551	0.0270	965.65
$f_y = 50,000$ psi				
3000	0.0040	0.02753	0.0108	482.80
4000	0.0040	0.03671	0.0144	643.80
5000	0.0042	0.04318	0.0180	804.70
6000	0.0046	0.04858	0.0216	965.70
$f_y = 60,000$ psi				
3000	0.0033	0.0214	0.0090	482.82
4000	0.0033	0.0285	0.0120	643.76
5000	0.0035	0.0335	0.0150	804.71
6000	0.0039	0.0377	0.0180	965.65
$f_y = 75,000$ psi				
3000	0.0027	0.0155	0.0072	482.80
4000	0.0027	0.0207	0.0096	643.80
5000	0.0028	0.0243	0.0120	804.70
6000	0.0031	0.0274	0.0144	965.70

Table 6. Areas of Multiple of Reinforcing Bars (in²)

Number of bars	Bar number								
	#3	#4	#5	#6	#7	#8	#9	#10	#11
1	0.11	0.20	0.31	0.44	0.60	0.79	1.00	1.27	1.56
2	0.22	0.40	0.62	0.88	1.20	1.58	2.00	2.54	3.12
3	0.33	0.60	0.93	1.32	1.80	2.37	3.00	3.81	4.68
4	0.44	0.80	1.24	1.76	2.40	3.16	4.00	5.08	6.24
5	0.55	1.00	1.55	2.20	3.00	3.95	5.00	6.35	7.80
6	0.66	1.20	1.86	2.64	3.60	4.74	6.00	7.62	9.36
7	0.77	1.40	2.17	3.08	4.20	5.53	7.00	8.89	10.92
8	0.88	1.60	2.48	3.52	4.80	6.32	8.00	10.16	12.48
9	0.99	1.80	2.79	3.96	5.40	7.11	9.00	11.43	14.04
10	1.10	2.00	3.10	4.40	6.00	7.90	10.00	12.70	15.60

Table 7. Minimum Required Beam Width, b (in.)

Number of bars	Bar number								
	# 3 and #4	#5	#6	#7	#8	#9	#10	#11	
2	6.0	6.0	6.5	6.5	7.0	7.5	8.0	8.0	
3	7.5	8.0	8.0	8.5	9.0	9.5	10.5	11.0	
4	9.0	9.5	10.0	10.5	11.0	12.0	13.0	14.0	
5	10.5	11.0	11.5	12.5	13.0	14.0	15.5	16.5	
6	12.0	12.5	13.5	14.0	15.0	16.5	18.0	19.5	
7	13.5	14.5	15.0	16.0	17.0	18.5	20.5	22.5	
8	15.0	16.0	17.0	18.0	19.0	21.0	23.0	25.0	
9	16.5	17.5	18.5	20.0	21.0	23.0	25.5	28.0	
10	18.0	19.0	20.5	21.5	23.0	25.5	28.0	31.0	

Table 8. Reinforced Steel Properties

Bar number	3	4	5	6	7	8	9	10	11	14	18
Unit weight per foot (lb)	0.376	0.668	1.043	1.502	2.044	2.670	3.400	4.303	5.313	7.650	13.60
Diameter (in.)	0.375	0.500	0.625	0.750	0.875	1.000	1.128	1.270	1.410	1.693	2.257
Area (in ²)	0.11	0.20	0.31	0.44	0.60	0.79	1.00	1.27	1.56	2.25	4.00