

To meet average conditions, tables are given for concrete testing 3000 only in standard 6 x 12 cylinders at 28 days and for deformed bars stressed 5000 psi. Columns are worked also for the richer mixes of 3750 and 5000 psi. Weaker concretes can be worked fairly closely by direct ratio of their strength to 3000 psi, though at "balanced reinforcement" there can be quite a variation.

U. S. Department of Commerce Simplified Practice Recommendation establishes all bars as round and designates sizes by number as outlined on page 3. Throughout this book, this numbering system is used.

ASTM specification for "Minimum Requirements for the Deformations of Deformed Steel Bars for Concrete Reinforcement (ASTM A305-56T)" establishes the projection and spacing of deformations. Under "Building Requirements for Reinforced Concrete (ACI 318-56)," increased bond (diagonal tension values are permitted, provided bars meet this specification). These higher values are used throughout the book.

REFERENCES

Many useful data on reinforced concrete design are not reproduced here in their entirety. The reader is advised to procure (at a nominal charge) a copy of the American Concrete Institute * "Building Code Requirements for Reinforced Concrete (ACI 318-56)," which is the recognized authority in this field; also a copy of the "Manual of Standard Practice for Detailing Reinforced Concrete Structures (ACI 315)," which supplies a great amount of information on the standard methods of delineating reinforced concrete.

He should also have a copy of the Concrete Reinforcing Steel Institute † "Reinforced Concrete—A Manual of Standard Practice," which covers materials available, standard methods of fabricating, and standard practices of estimating and contracting for such items. Another helpful book covering the placement of bars, supports, and welded wire fabric is "CRSI Recommended Practice for Placing Reinforcing Bars." †

The Portland Cement Association ‡ issues material upon the techniques of construction and design procedures for reinforced concrete structures, most of which is available upon request.

The American Concrete Institute,* in addition to the codes and manuals described above, issues many reference books and a regular monthly publication, "Journal of the American Concrete Institute," devoted to all phases of design of reinforced concrete structures and to better procedures for concrete proportioning, mixing, placing, and curing.

* American Concrete Institute, P.O. Box 4754, Redford Station, Detroit 19, Michigan.

† Concrete Reinforcing Steel Institute, 228 North LaSalle Street, Chicago 1, Illinois.

‡ Portland Cement Association, 33 West Grand Avenue, Chicago 10, Illinois.

A305 STANDARD REINFORCING BARS

BAR SIZES		WEIGHT (Pounds per Foot)	NOMINAL DIM.—ROUND SECT.	
OLD (Inches)	NEW (Numerals)		DIAMETER (Inches)	CROSS SEC. AREA, (Sq. In.)
1/4	#2	.167	.250	.05
3/8	#3	.376	.375	.11
1/2	#4	.668	.500	.20
5/8	#5	1.043	.625	.31
3/4	#6	1.502	.750	.44
7/8	#7	2.044	.875	.60
1	#8	2.670	1.000	.79
1 1/8	#9	3.400	1.128	1.00
1 1/4	#10	4.303	1.270	1.27
1 1/2	#11	5.313	1.410	1.56
Special	#14S	7.65	1.693	2.25
Special	#18S	13.60	2.257	4.00
Special				5.32
Special				7.09

The new bar numbers are based on the number of 1/4 inches included in the nominal diameter of the bar. Bar #2 in plain rounds only. Bars #9, 10, 11 are round bars and equivalent in weight and nominal cross sectional area to the old type 1", 1 1/8" and 1 1/4" square bars.

The above weights were adopted as standards by the Institute in 1934.

These weights have been approved through the U. S. Department of Commerce Simplified Practice Recommendation 26.

SPECIAL DEFORMED ROUND STEEL BARS (ASTM Designation A408)

Special	#14S	7.65	1.693	2.25	5.32
Special	#18S	13.60	2.257	4.00	7.09

These large bars are outside the scope of ASTM A15 for Billet Bars and ASTM A305 for Deformations. Sizes #14S and #18S reinforcing bars are not carried in regular stock. These sizes available only by special arrangement with the supplier.

* Copies of this table (heavy cardboard and suitable for hanging on the wall or celluloid pocket-size) may be obtained from the Concrete Reinforcing Steel Institute, 38 South Dearborn Street, Chicago 3, Illinois.

DIMENSIONAL REQUIREMENTS FOR DEFORMED STEEL BARS FOR CONCRETE REINFORCEMENT, ASTM DESIGNATIONS A305 & A408 †

Deformed Bar Designation Number	Deformation Requirements			
	Max Avg Spacing (in.)	Min Height (in.)	Max Gap (in.) Chord of 12 1/2 Per Cent of Nom- inal Perimeter	
3	0.262	0.015	0.143	
4	0.350	0.020	0.191	
5	0.437	0.028	0.239	
6	0.525	0.038	0.286	
7	0.612	0.044	0.334	
8	0.700	0.050	0.383	
9	0.790	0.056	0.431	
10	0.889	0.064	0.487	
11	0.987	0.071	0.540	
14S	1.185	0.085	0.648	
18S	1.580	0.102	0.864	

† Weights, diameters, areas, and perimeters of ASTM A305 bars are given above in table headed "A305 Standard Reinforcing Bars."