General and Technical Information

Table 1.1 Reinforcing Bar Data

Reinforcing Bars Size Designations and Nominal Dimensions				
Bar Size Designation	Nominal Dimensions			Ultimate Minimum Capacity 1.5 f_y
	Diameter (inches)	Area (inches^2)	Weight (lbs./ft.)	pounds
#4 [#13]	0.500	0.20	0.688	18,000
#5 [#16]	0.625	0.31	1.043	27,900
#6 [#19]	0.750	0.44	1.502	39,600
#7 [#22]	0.875	0.60	2.044	54,000
#8 [#25]	1.000	0.79	2.670	71,100
#9 [#29]	1.128	1.00	3.400	90,000
#10 [#32]	1.270	1.27	4.303	114,300
#11 [#36]	1.410	1.56	5.313	140,400
#14 [#43]	1.693	2.25	7.650	202,500
#18 [#57]	2.257	4.00	13.600	360,000

*Rebar size is based on the number of eighths of an inch included in the nominal diameter of the bar.

Note: The nominal dimensions of a deformed rebar are equivalent to those of a plain, round bar having the same weight (mass) per foot (meter) as the deformed rebar.

Nearly all reinforcing bars currently produced in the USA are marked with the numbers 13, 16, etc., to designate bar sizes. These bar size numbers correspond to the traditional designations 4, 5, etc., as shown in the accompanying table.

ACI 318-02 still list the bar sizes traditionally using #3 - #18 designations. The tables in this manual are typically designated #3 [#10] or simply use the traditional designations.

Table 1.2 Mechanical Requirements For Standard ASTM Deformed Reinforcing Bars*

Type of Steel and ASTM Designation	Bar Nos. Range	Grade[1]	Minimum[2] Yield Strength, psi	Minimum Tensile Strength, psi	Minimum Percentage Elongation in 8 in.	Cool Bend Test[3] Pin Diameter (d=nominal diameter of specimen)
Billet-Steel A615	3-6	40	40,000	70,000	#3.....11 #4, #5, #6.....12	#3, #4, #5.....3-1/2d #6.....5d
	3-11, 14, 18	60	60,000	90,000	#3, #4, #5, #6.....9 #7, #8.....8 #9, #10, #11, #14, #18...7	#3, #4, #5.....3-1/2d #6, #7, #8.....5d #9, #10, #11.....7d #14, #18 (90°).....9d
	6-11, 14, 18	75	75,000	100,000	#6, #7, #8.....7 #9, #10, #11, #14, #18...6	#6, #7, #8.....5d #9, #10, #11.....7d #14, #18 (90°).....9d
Low-Alloy Steel A706	3-11, 14, 18	60	60,000[4]	80,000[5]	#3, #4, #5, #6.....14 #7, #8, #9, #10, #11....12 #14, #18.....10	#3, #4, #5.....3d #6, #7, #8.....4d #9, #10, #11.....6d #14, #18.....8d

* For the mechanical requirements of rail-steel and axle-steel bars, see ASTM specifications A616 and A617, respectively.
[1] Minimum yield designation (KSI).
[2] Yield point or yield strength. See ASTM specifications.
[3] Test bends 180°, unless noted otherwise.
[4] Maximum yield strength 78,000 psi (ASTM A706 only).
[5] Tensile Strength shall not be less than 1.25 times the actual yield strength (ASTM A706 only).