ALLOWABLE UNIT STRESSES AND LOADS IN ACCORDANCE WITH THE BUILDING LAWS OF VARIOUS CITIES.

Allowable Unit Stresses for Steel and Iron.	REVISED TO 1912. New York.	Chicago.	Philadelphia.	Boston.
	Pounds per Square Inch.			
Compression: Rolled Steel	16 000	14 000	14 500‡	.....
Rolled Steel	"	"	16 250‖	.....
Cast "	16 000	16 000	.....	16 000
Wrought Iron	12 000	10 000	12 500	12 000
Cast " (in Short Blocks)	16 000	10 000	17 500	.....
Steel Pins and Rivets (Bearing)	20 000	20 000	.....	18 000
Wr't Iron Pins and Rivets (Bearing)	15 000	.....	.....	15 000
Tension: Rolled Steel	16 000	16 000	14 500‡	16 000
Rolled Steel	"	"	16 250‖	16 000
Cast "	16 000	16 000	.....	.....
Wrought Iron	12 000	12 000	12 500	12 000
Cast "	3 000	.....	.....	.....
Extreme Fibre Stress—Bending:				
Rolled Steel Beams	16 000	16 000	.....	16 000
" " Pins, Rivets and Bolts	20 000	25 000	.....	22 500
Riveted " Beams (Net Flange Sec.)	14 000	16 000	.....	.....
Rolled Wr't Iron Beams	12 000	12 000	.....	12 000
" " " Pins, Rivets & Bolts	15 000	.....	.....	18 000
Riveted " " Beams (Net Flange Section)	12 000	12 000	.....	.....
Cast Iron—Compression Side	16 000	10 000	.....	16 000
" " Tension "	3 000	3 000	3 750	3 000
Compression in Flanges of Built Beams, Steel	.....	.....	.....	16 000
Compression in Flanges of Built Beams, Wrought Iron	.....	.....	.....	12 000
Shear: Steel Web Plates	9 000	10 000	8 750‡	10 000
Steel Web Plates	"	"	10 000‖	"
" Shop Rivets and Pins	10 000	12 000	8 750‡	"
" " " "	"	"	10 000‖	"
" Field " " "	8 000	10 000	8 750‡	"
" " " " "	"	"	10 000‖	"
" " Bolts	7 000	.....	8 750‡	8 000
" " "	"	.....	10 000‖	"
Wrought Iron Web Plates	6 000	.....	7 500	9 000
" " Shop Rivets and Pins	7 500	.....	"	"
" " Field "	6 000	"	"	"
" " " Bolts	5 500	.....	"	7 200
Cast Iron	3 000	2 000	.....	.....
			14 500	16 000
Columns: Mild Steel	15 200–58 $\frac{L}{R}$	16 000–70 $\frac{L}{R}$	$1+\frac{L^2}{13\,500R^2}$	$1+\frac{L^2}{30\,000R^2}$
			16 250	
Medium Steel	"	"	$1+\frac{L^2}{11\,000R^2}$	"
			12 500	12 000
Wrought Iron	14 000–80 $\frac{L}{R}$	12 000–60 $\frac{L}{R}$	$1+\frac{L^2}{15\,000D^2}$	$1+\frac{L^2}{20\,000R^2}$
			11 700	See Section 14 of Boston Building Laws.
Cast Iron	11 300–30 $\frac{L}{R}$	10 000–40 $\frac{L}{R}$	$1+\frac{L^2}{400\,D^2}$	

L = Length of column in inches. ‡ Mild. ‖ Medium.
R = Least radius of gyration in inches.

ALLOWABLE UNIT STRESSES AND LOADS IN ACCORDANCE WITH THE BUILDING LAWS OF VARIOUS CITIES.

Live Loads for Floors in Different Classes of Buildings, Exclusive of the Weight of the Materials of Construction.	REVISED TO 1912. New York.	Chicago.	Philadelphia.	Boston.
	Pounds per Square Foot.			
Dwellings, Apartment Houses, Hotels, Tenement Houses or Lodging Houses	60	50	70	50
Office Buildings—First Floor	150	50	100	100
" " above First Floor	75	50	100	100
Schools or Places of Instruction	75	75	.....	60
Stables or Carriage Houses	75	40* 100†	.....	.....
Buildings for Public Assembly	90	100	120	125
" " Ordinary Stores, Light Manufacturing and Light Storage	120	100	120	125
Stores for Heavy Materials, Warehouses and Factories	150	100	150	250
Roofs—Pitch less than 20°	50	25	30	25‡
" " more " 20°	30	25	30	25‡
Sidewalks	300	.....	.....	.....
Public Buildings, except Schools	.....	100	.....	125
Allowable Unit Stresses for Masonry and Building Materials.				
Compression:	Pounds per Square Inch.			
Concrete (Portland) Cement, 1; Sand, 2; Stone, 4	230	350	208	See Section 14, Boston Building Laws.
Concrete (Portland) Cement, 1; Sand, 2; Stone, 5	208	300	"	
Concrete (Rosendale or equal) Cement, 1; Sand, 2; Stone, 4	125	.....	"	
Concrete (Rosendale or equal) Cement, 1; Sand, 2; Stone, 5	111	150	"	
Rubble Stonework, Portland Cement Mortar	140	100	139	
Rubble Stonework, Rosendale Cement Mortar	111	.....	"	
Rubble Stonework, Lime and Cement Mortar	97	.....	111	
Rubble Stonework, Lime Mortar	70	60	69½	
Brickwork in Portland Cement Mortar; Cement, 1; Sand, 3	250	175	208	
Brickwork in Rosendale, or equal, Cement Mortar; Cement, 1; Sand, 3	208	150	"	
Brickwork in Lime and Cement Mortar; Cement, 1; Lime, 1; Sand, 6	160	125	167	
Brickwork in Lime Mortar; Lime, 1; Sand, 4	111	100	111	
Granites (according to Test)	1000 to 2400	600	.....	
Greenwich Stone	1200	.....	.....	
Gneiss (New York City)	1300	.....	.....	
Limestone (according to Test)	700 to 2300	400	.....	
Marble { " " " }	600 to 1200	.....	.....	
Sandstone { " " " }	400 to 1600	400	.....	
Bluestone (North River)	2000	.....	.....	
Brick (Haverstraw, Flatwise)	300	.....	.....	
Slate	1000	.....	.....	

* Stables less than 500 Square Feet in Area.
† " over 500 " " " "
‡ Make proper allowance for Wind at 30 lbs. per Square Foot Horizontal.

ALLOWABLE UNIT STRESSES AND LOADS IN ACCORDANCE WITH THE BUILDING LAWS OF VARIOUS CITIES.

Allowable Unit Stresses for Masonry.	REVISED TO 1912			
	New York.	Chicago.	Philadelphia.	Boston.
Extreme Fibre Stress—Bending:	Pounds per Square Inch.			
Granite	180	.....	.....	.....
Greenwich Stone	150	.....	.....	.....
Gneiss (New York City)	150	.....	.....	.....
Limestone	150	.....	.....	.....
Slate	400	.....	.....	.....
Marble	120	.....	.....	.....
Sandstone	100	.....	.....	.....
Bluestone—North River	300	.....	.....	.....
Concrete (Portland) Cement, 1; Sand, 2; Stone, 4	30	.....	.....	.....
Concrete (Portland) Cement, 1; Sand, 2; Stone, 5	20	.....	.....	.....
Concrete (Rosendale or equal) Cement, 1; Sand, 2; Stone, 4	16	.....	.....	.....
Concrete (Rosendale or equal) Cement, 1; Sand, 2; Stone, 5	10	.....	.....	.....
Brick (Common)	50	.....	.....	.....
Brickwork (in Cement)	30	.....	.....	.....
Allowable Unit Stresses for Timber.				
Compression:				
Oak, with Grain	900	900	.....	.....
" across "	800	500	.....	600
Yellow Pine, with Grain	1000	1200	750	.....
" " across "	600	350	550	500
White " with "	800	700	.....	.....
" " across "	400	200	.....	250
Spruce, with Grain	800	.....	500	.....
" across "	400	.....	300	250
Locust, with "	1200	.....	.....	.....
" across "	1000	.....	.....	.....
Hemlock, with "	500	500	350	.....
" across "	500	150	250	.....
Chestnut, with "	500	.....	.....	.....
" across "	1000	.....	.....	.....
Tension:				
Yellow Pine	1200	1500	1800	.....
White "	800	800	.....	.....
Spruce	800	.....	1250	.....
Oak	1000	1200	.....	.....
Hemlock	600	600	1000	.....

ALLOWABLE UNIT STRESSES AND LOADS IN ACCORDANCE WITH THE BUILDING LAWS OF VARIOUS CITIES.

Allowable Unit Stresses for Timber.	REVISED TO 1912. New York.	Chicago.	Philadelphia.	Boston.
	Pounds per Square Inch.			
Extreme Fibre Stress—Bending:				
Yellow Pine	1200	1500	1600	1500
White "	800	800	.....	1000
Spruce	800	.....	1100	1000
Oak	1000	1200	.....	1000
Locust	1200	.....	.....	.....
Hemlock	600	600	900	.....
Chestnut	800	.....	.....	.....
Wooden Columns or Posts with Flat Ends.				
Yellow Pine (Long Leaf)	$1000-18\frac{L}{D}$	$C\left(1-\frac{L}{80D}\right)$	$U-\frac{UL}{100\,D}$	$1000-10\frac{L}{D}$
White Pine, Norway Pine and Spruce	$800-15\frac{L}{D}$		"	$700-7\frac{L}{D}$
Oak	$900-17\frac{L}{D}$		"	$900-9\frac{L}{D}$
Chestnut and Hemlock	$\frac{5}{8}\left(800-15\frac{L}{D}\right)$	.....	"	.....
Locust	$1\frac{1}{2}($ " $)$	.....	"	.....
Shear: Yellow Pine, with Fibre	70	150	$66\frac{2}{3}$	100
Yellow Pine, across Fibre	500	.....	750	
White " with "	40	80	.....	80
" " across "	250	.....	.....	
Spruce, with Fibre	50	.....	50	80
" across "	320	.....	500	
Oak with "	100	200	.....	150
" across "	600	.....	.....	.....
Locust, with "	100	.....	.....	.....
" across "	720	.....	.....	.....
Hemlock, with "	40	60	$41\frac{2}{3}$	.....
" across "	275	.....	$416\frac{2}{3}$	.....
Chestnut, " "	150	.....	.....	.....

U = Allowable Compression in Lbs. per Sq. Inch and $\frac{L}{D}$ = Ratio of Length to Diameter in Inches. C = Compressive Strength with grain.

Allowable Unit Stresses for Timber Columns in Accordance with the Building Laws of Boston.

For Posts with Flat Ends.

The Stresses given in the following table, in which L = Length of Post, D = Least Diameter of Post, and S = Stress per Square Inch.

$\frac{L}{D}$	White Pine and Spruce.	Long-leaf Yellow Pine.	White Oak.
	S	S	S
0 to 10	630	900	810
10 " 15	595	850	765
15 " 20	560	800	720
20 " 25	525	750	675
25 " 30	490	700	630

For information not given in these tables, see Complete Building Laws of the Various Cities.