

Table V. Unit Working Stresses from the Joint Code

Classification of stresses	Allowable unit working stresses in lb per sq in			
	For any strength of concrete as fixed by test in ac- cordance with code require- ments $n = \frac{30\,000}{f'_c}$	When strength of con- crete is fixed by the water-cement ratio in accordance with code requirements		
		$f'_c =$ 2 000 lb $n = 15$	$f'_c =$ 2 500 lb $n = 12$	$f'_c =$ 3 000 lb $n = 10$
Flexure:				
Extreme fiber stress in compression..	$0.40 f'_c$	800	1 000	1 200
Extreme fiber stress in compression adjacent to supports of continuous or fixed beams or of rigid frames...	$0.45 f'_c$	900	1 125	1 350
Shear:				
Beams with no web reinforcement and without special anchorage of longitudinal steel.....	$0.02 f'_c$	40	50	60
Beams with no web reinforcement, but with special anchorage of lon- gitudinal steel.....	$0.03 f'_c$	60	75	90
Beams with properly designed web re- inforcement, but without special anchorage of longitudinal steel.....	$0.06 f'_c$	120	150	180
Beams with properly designed web reinforcement and with special an- chorage of longitudinal steel.....	$0.09 f'_c$	180	225	270
Flat slabs at distance d from edge of column cap or drop panel.....	$0.03 f'_c$	60	75	90
Footings where longitudinal bars have no special anchorage.....	$0.02 f'_c$	40	50	60
Footings where longitudinal bars have special anchorage.....	$0.03 f'_c$	60	75	90
Bond:				
In beams and slabs and one-way footings:				
Plain bars.....	$0.04 f'_c$	80	100	120
Deformed bars.....	$0.05 f'_c$	100	125	150
In two-way footings:				
Plain bars.....	$0.03 f'_c$	60	75	90
Deformed bars.....	$0.0375 f'_c$	75	94	112
(Where special anchorage is pro- vided double these values in bond may be used.)				
Bearing:				
Where a concrete member has an area at least twice the area in bearing.....	$0.25 f'_c$	500	625	750

Table IV. Unit Working Stresses for Static Loads
From various building codes

Classification of stresses	Working stresses, in lb per sq in			
	1928 * San Fran- cisco	1929, Philadelphia		1930 Boston
		Propor- tionment by arbi- trary volumes†	Propor- tionment by water/ cement ratio‡	
Extreme fiber-stress in concrete in compression:				
In general.....	715	650	40% f'_c	715
Adjacent to supports of continu- ous beams.....	825	747	45% f'_c	825
Concentric compression in concrete	495	500	25% f'_c	495
Shearing-stress in concrete when no steel is provided to resist diagonal-tension.....	40	2% f'_c	44
Vertical shearing-stress when the diagonal-tension requirements are satisfied.....	132	120	9% § f'_c	132
Bond-stress:				
Between concrete and plain bars.	88	80	4% f'_c	88
Between concrete and deformed bars.....	110	100	5% f'_c	110
Maximum tensile stress in steel re- inforcement.....	18 000	18 000	18 000	18 000
Maximum tensile stress in cold- drawn steel wire.....	20 000	22 500

* Values based on a 28-day compressive strength of 2 200 lb per sq in, and correspond-
ing to a mixture of one part cement to six parts of combined aggregate, where the coarse
aggregate is of granite or trap-rock. The proportions are by volume of cement to the
combined aggregates, measured separately. For example, a 1 : 2 : 4 mixture might also
be referred to as a 1 : 6 mixture.

† Values based on a 28-day compressive strength of 2 000 lb per sq in; proportions,
one part of cement to six parts of combined aggregate. The amount of water, including
the moisture content of the aggregate, is limited to 7¼ gallons per bag of cement.

‡ The value of f'_c represents the 28-day compressive strength as determined by actual
tests. The concrete is proportioned by the inspector. The following table gives the
approximate quantities of combined aggregates, water ratios, and corresponding mini-
mum 28-day strengths for the various mixtures. Water or moisture contained in the
aggregates and ascertained by daily tests, is to be included in determining the amount of
water corresponding to a required water-cement ratio.

Approximate volume of Port- land cement to sum of sep- arate volumes of dry and rodded fine and coarse ag- gregate	Water-cement ratio, United States gal per 94-lb sack of cement	Assumed ultimate strength at 28 days
1 : 8½	8¼	1 500
1 : 6½	7½	2 000
1 : 5½	6¾	2 500
1 : 5	6	3 000

§ Beams with web-reinforcement and longitudinal bars having special anchorage.