Table 1.10 Tension Lap Splice Lengths – Grade 60 Uncoated Bars

f'_c = 3,000 psi or greater, Normal Weight Concrete

DESIGN AND DETAILING DATA – ACI ACI Tension Lap Splice Lengths for f'_c =3,000, 4,000, and 5,000 psi

Bar Size	Lap Class	f'_c = 3,000 psi				f'_c = 4,000 psi				f'_c = 5,000 psi			
		Top Bars		Other Bars		Top Bars		Other Bars		Top Bars		Other Bars	
		Case 1	Case 2	Case 1	Case 2	Case 1	Case 2	Case 1	Case 2	Case 1	Case 2	Case 1	Case 2
#3 [#10]	A	22	32	17	25	19	28	15	22	17	25	13	19
	B	28	42	22	32	24	36	19	28	22	33	17	25
#4 [#13]	A	29	43	22	33	25	37	19	29	22	33	17	26
	B	37	56	29	43	32	48	25	37	29	43	22	33
#5 [#16]	A	36	54	28	41	31	47	24	36	28	42	22	32
	B	47	70	36	54	40	60	31	47	36	54	28	42
#6 [#19]	A	43	64	33	50	37	56	29	43	33	50	26	38
	B	56	84	43	64	48	72	37	56	43	65	33	50
#7 [#22]	A	63	94	48	72	54	81	42	63	49	73	37	56
	B	81	122	63	94	70	106	54	81	63	94	49	73
#8 [#25]	A	72	107	55	82	62	93	48	72	55	83	43	64
	B	93	139	72	107	80	121	62	93	72	108	55	83
#9 [#29]	A	81	121	62	93	70	105	54	81	63	94	48	72
	B	105	157	81	121	91	136	70	105	81	122	63	94
#10 [#32]	A	91	136	70	105	79	118	61	91	70	105	54	81
	B	118	177	91	136	102	153	79	118	91	137	70	105
#11 [#36]	A	101	151	78	116	87	131	67	101	78	117	60	90
	B	131	196	101	151	113	170	87	131	101	152	78	117
#14 [#43]	N/A	121	181	93	139	105	157	81	121	94	140	72	108
#18 [#57]	N/A	161	241	124	186	139	209	107	161	125	187	96	144

Notes:

1. Tabulated values are based on Grade 60 reinforcing bars and normal-weight concrete.

2. Tension development lengths and tension lap splice lengths are based on ACI 318-02, Sections 12.2.2 and 12.15, respectively. Tabulated values for beams or columns are based on transverse reinforcement and concrete cover meeting minimum Code requirements. Lengths are in inches.

3. Cases 1 and 2, which depend on the type of structural element, concrete cover, and the center-to-center spacing of the bars, are defined as:

Beams or Columns	Case 1	Cover at least 1d_b and c.-c. spacing at least 2d_b
	Case 2	Cover less than 1d_b or c.-c. spacing less than 2d_b
All Others	Case 1	Cover at least 1d_b and c.-c. spacing at least 3d_b
	Case 2	Cover less than 1d_b or c.-c. spacing less than 3d_b

4. Lap Class A values are the required tension development lengths, ℓ_d; lap splice lengths are multiples of tension development lengths; Class A - 1.0ℓ_d and Class B = 1.3ℓ_d (ACE 318-02, Section 12.15.1).

5. Lap splices of #14 [#43] or #18 [#57] bars are not permitted. The tabulated values for those bar sizes are the tension development lengths.

6. Top bars are horizontal bars with more than 12 inches of concrete cast below the bars.

7. For lightweight aggregate concrete, multiply the tabulated values by 1.3; or when f_{ct} is specified, the factor is $6.7\sqrt{f'_c}/f_{ct} \geq 1.0$.

8. For epoxy-coated bars, multiply the tabulated values by one of the following factors:

Concrete Cover and Spacing	Top Bars	Other Bars
Cover < 3d_b or c.-c. spacing > 7d_b	1.7 / 1.3 - 1.31	1.50
Cover ≤ 3d_b or c.-c. spacing ≤ 7d_b	1.20	1.20