

A

B

C

D

E

F

G

H

I

J

TABLE 1 – TENSION DEVELOPMENT AND LAP SPLICE LENGTHS FOR UNCOATED BARS IN BEAMS AND COLUMNS⁹

BAR SIZE	LAP CLASS	LENGTHS (in.) PER CONCRETE STRENGTH (psi)														
		4000 psi					5000 psi					6000 psi				
		TOP BARS			OTHER BARS		TOP BARS			OTHER BARS		TOP BARS			OTHER BARS	
		CASE 1	CASE 2	CASE 3	CASE 1	CASE 2	CASE 1	CASE 2	CASE 3	CASE 1	CASE 2	CASE 1	CASE 2	CASE 3	CASE 1	CASE 2
#3	A	12	19	28	12	15	22	12	17	25	12	15	23	12	12	15
(#10)	B	16	24	36	16	19	28	16	22	33	16	17	25	16	20	30
#4	A	15	25	37	12	19	29	14	22	33	12	17	26	12	20	31
(#13)	B	20	32	48	16	25	37	18	29	43	16	22	33	16	26	40
#5	A	19	31	47	15	24	36	17	28	42	13	22	32	15	25	38
(#16)	B	24	40	60	19	31	47	22	36	54	17	28	42	20	33	49
#6	A	23	37	56	17	29	43	20	33	50	16	26	38	18	31	46
(#19)	B	29	48	72	23	37	56	26	43	65	20	33	50	24	40	59
#7	A	33	54	81	25	42	63	29	49	73	23	37	56	27	44	66
(#22)	B	43	70	106	33	54	81	38	63	94	29	49	73	35	58	86
#8	A	37	62	93	29	48	71	33	55	83	26	43	64	30	51	76
(#25)	B	49	80	121	37	62	93	43	72	108	33	55	83	40	66	98
#9	A	42	70	105	33	54	81	38	63	94	29	48	72	34	57	86
(#29)	B	55	91	136	42	70	105	49	81	122	38	63	94	45	74	111
#10	A	47	79	118	37	61	91	42	70	105	33	54	81	39	64	96
(#32)	B	62	102	153	47	79	118	55	91	137	42	70	105	50	83	125
#11	A	53	87	131	41	67	101	47	78	117	36	60	90	43	71	107
(#36)	B	68	113	170	53	87	131	61	101	152	47	78	117	56	93	139
#14 ⁵	N/A	63	105	157	49	81	121	56	94	140	43	72	108	51	86	128
(#43)	N/A	84	139	209	65	107	161	75	125	187	58	96	144	68	114	171

BASED ON ACI 318-12, SECTION 12.2 & 12.15

TABLE 3 – TENSION DEVELOPMENT AND LAP SPLICE LENGTHS FOR BARS IN WALLS AND SLABS

BAR SIZE	LAP CLASS	f _c = 5000 psi															
		CONCRETE COVER = 0.75"				CONCRETE COVER = 1.00"				CONCRETE COVER = 1.50"				CONCRETE COVER = 2.00"			
		UNCOATED		EPOXY-COATED ⁸		UNCOATED		EPOXY-COATED ⁸		UNCOATED		EPOXY-COATED ⁸		UNCOATED		EPOXY-COATED ⁸	
		TOP	OTHER	TOP	OTHER	TOP	OTHER	TOP	OTHER	TOP	OTHER	TOP	OTHER	TOP	OTHER	TOP	OTHER
#3	A	12	12	13	12	12	12	13	12	12	12	12	12	12	12	12	12
(#10)	B	16	16	17	16	16	16	17	16	16	16	16	16	16	16	16	16
#4	A	17	13	22	20	14	12	18	16	14	12	16	13	14	12	16	13
(#13)	B	22	17	29	25	18	16	23	20	18	16	21	16	18	16	21	16
#5	A	25	19	32	28	20	16	26	23	17	13	22	19	17	13	20	16
(#16)	B	32	25	42	37	26	20	34	30	22	17	29	25	22	17	26	20
#6	A	33	26	44	39	27	21	36	32	20	16	26	23	20	16	26	23
(#19)	B	43	33	57	50	36	27	46	41	26	20	34	30	26	20	34	30
#7	A	54	41	–	–	44	34	–	–	33	26	–	–	29	23	–	–
(#22)	B	70	54	–	–	58	44	–	–	43	33	–	–	38	29	–	–
#8	A	67	51	–	–	56	43	–	–	42	32	–	–	33	26	–	–
(#25)	B	86	67	–	–	72	56	–	–	54	42	–	–	43	33	–	–
#9	A	81	62	–	–	68	52	–	–	51	40	–	–	41	32	–	–
(#29)	B	105	81	–	–	88	68	–	–	67	51	–	–	54	41	–	–
#10	A	97	75	–	–	82	63	–	–	63	48	–	–	51	39	–	–
(#32)	B	126	97	–	–	106	82	–	–	82	63	–	–	66	51	–	–
#11	A	113	87	–	–	97	75	–	–	75	58	–	–	61	47	–	–
(#36)	B	147	113	–	–	126	97	–	–	97	75	–	–	79	61	–	–

BASED ON ACI 318-12, SECTION 12.2 & 12.15

TABLE 6 – TENSION DEVELOPMENT LENGTHS OF STANDARD HOOKS AND ASTM A970 TERMINATORS FOR UNCOATED BARS

BAR SIZE	LENGTHS (in.) PER CONCRETE STRENGTH (psi)				
	4000 psi	5000 psi	6000 psi	7000 psi	8000 psi
#3	7	7	6	6	6
(#10)					
#4	10	9	8	7	7
(#13)					
#5	12	11	10	9	9
(#16)					
#6	15	13	12	11	10
(#19)					
#7	17	15	14	13	12
(#22)					
#8	19	17	16	15	14
(#25)					
#9	22	19	18	16	15
(#29)					
#10	24	22	20	19	17
(#32)					
#11	27	24	22	21	19
(#36)					
#14	32	29	27	25	23
(#43)					
#18	43	39	35	33	31
(#57)					

BASED ON ACI 318-12, SECTION 12.5

TABLE 7 – TENSION DEVELOPMENT LENGTHS OF STANDARD HOOKS AND ASTM A970 TERMINATORS FOR EPOXY-COATED BARS⁸

BAR SIZE	LENGTHS (in.) PER CONCRETE STRENGTH (psi)				
	4000 psi	5000 psi	6000 psi	7000 psi	8000 psi
#3	9	8	7	7	6
(#10)					
#4	12	10	10	9	8
(#13)					
#5	15	13	12	11	10
(#16)					
#6	17	16	14	13	12
(#19)					

BASED ON ACI 318-12, SECTION 12.5

TABLE 2 – TENSION DEVELOPMENT AND LAP SPLICE LENGTHS FOR BARS IN WALLS AND SLABS

BAR SIZE	LAP CLASS	f _c = 4000 psi															
		CONCRETE COVER = 0.75"				CONCRETE COVER = 1.00"				CONCRETE COVER = 1.50"				CONCRETE COVER = 2.00"			
		UNCOATED		EPOXY-COATED ⁸		UNCOATED		EPOXY-COATED ⁸		UNCOATED		EPOXY-COATED ⁸		UNCOATED		EPOXY-COATED ⁸	
		TOP	OTHER	TOP	OTHER	TOP	OTHER	TOP	OTHER	TOP	OTHER	TOP	OTHER	TOP	OTHER	TOP	OTHER
#3	A	12	12	15	13	12	12	15	13	12	12	15	13	12	12	14	12
(#10)	B	16	16	19	17	16	16	19	17	16	16	19	17	16	16	18	16
#4	A	19	15	24	22	15	12	20	17	15	12	18	14	15	12	18	14
(#13)	B	24	19	32	28	20	16	25	22	20	16	23	18	20	16	23	18
#5	A	28	21	36	32	22	17	29	26	19	15	24	22	19	15	22	17
(#16)	B	36	28	47	41	29	22	38	33	24	19	32	28	24	19	29	22
#6	A	37	29	49	43	31	24	40	35	22	17	29	26	22	17	29	26
(#19)	B	48	37	63	56	40	31	52	46	29	22	38	34	29	22	38	34
#7	A	60	46	–	–	50	38	–	–	37	28	–	–	33	25	–	–
(#22)	B	78	60	–	–	64	50	–	–	48	37	–	–	42	33	–	–
#8	A	74	57	–	–	62	48	–	–	47	36	–	–	37	29	–	–
(#25)	B	96	74	–	–	80	62	–	–	60	47	–	–	48	37	–	–
#9	A	90	69	–	–	76	58	–	–	57	44	–	–	46	36	–	–
(#29)	B	117	90	–	–	98	76	–	–	74	57	–	–	60	46	–	–
#10	A	108	83	–	–	92	70	–	–	70	54	–	–	57	44	–	–
(#32)	B	140	108	–	–	119	92	–	–	91	70	–	–	74	57	–	–
#11	A	127	98	–	–	108	83	–	–	84	64	–	–	68	53	–	–
(#36)	B	165	127	–	–	141	108	–	–	109	84	–	–	89	68	–	–

BASED ON ACI 318-12, SECTION 12.2 & 12.15

TABLE 4 – TENSION DEVELOPMENT AND LAP SPLICE LENGTHS FOR BARS IN WALLS AND SLABS

BAR SIZE	LAP CLASS	f'c = 6000 psi															
		CONCRETE COVER = 0.75"				CONCRETE COVER = 1.00"				CONCRETE COVER = 1.50"				CONCRETE COVER = 2.00"			
		UNCOATED		EPOXY-COATED ^a		UNCOATED		EPOXY-COATED ^a		UNCOATED		EPOXY-COATED ^a		UNCOATED		EPOXY-COATED ^a	
		TOP	OTHER	TOP	OTHER	TOP	OTHER	TOP	OTHER	TOP	OTHER	TOP	OTHER	TOP	OTHER	TOP	OTHER
#3 (#10)	A	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
	B	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
#4 (#13)	A	16	12	20	18	12	12	16	14	12	12	15	12	12	12	15	12
	B	20	16	26	23	16	16	21	18	16	16	19	16	16	16	19	16
#5 (#16)	A	23	17	29	26	18	14	24	21	16	12	20	18	16	12	18	14
	B	29	23	38	34	24	18	31	27	20	16	26	23	20	16	24	18
#6 (#19)	A	31	24	40	35	25	19	33	29	18	14	24	21	18	14	24	21
	B	40	31	52	46	33	25	42	37	24	18	31	28	24	18	31	28
#7 (#22)	A	49	38	-	-	41	31	-	-	30	23	-	-	27	21	-	-
	B	64	49	-	-	53	41	-	-	39	30	-	-	35	27	-	-
#8 (#25)	A	61	47	-	-	51	39	-	-	38	29	-	-	31	24	-	-
	B	79	61	-	-	66	51	-	-	49	38	-	-	40	31	-	-
#9 (#29)	A	74	57	-	-	62	48	-	-	47	36	-	-	38	29	-	-
	B	95	74	-	-	80	62	-	-	61	47	-	-	49	38	-	-
#10 (#32)	A	88	68	-	-	75	58	-	-	57	44	-	-	47	36	-	-
	B	115	88	-	-	97	75	-	-	75	57	-	-	60	47	-	-
#11 (#36)	A	104	80	-	-	88	68	-	-	68	53	-	-	56	43	-	-
	B	135	104	-	-	115	88	-	-	89	68	-	-	73	56	-	-