

Superelevation Tables

Design Manual

Chapter 2

Alignments

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Tables 1 through 10 contain values for minimum superelevation rate (e), superelevation runoff length (L), and tangent runout length (x) for roadway widths and maximum superelevation rates commonly used by the Department. Values of L and x are rounded to the nearest foot. Values of e are rounded up to the nearest two-tenths of a percent.

L and x for a given design speed, desirably should not be less than the minimums indicated on the tables. Tangent runout length is based on a normal cross slope of either 2 or 2.5 percent. See Section 2A-2 for determining tangent runout lengths for normal cross slopes other than 2 or 2.5 percent.

To determine the superelevation rate for a radius not listed in a table, select a superelevation rate associated with a radius closest to the desired radius. For example, a 50 mph curve with a maximum superelevation rate of 6 percent and a radius of 1800 ft should use a superelevation rate of 4.6 percent.

Quick Reference:

Refer to Table 10 for minimum radii and superelevation rate for low speed urban roadways.

Refer to Section 2A-2 to determine adjustment factors for roadway widths not listed in Tables 1 through 10. Apply adjustment factors to values of L and x for pavement widths of 12 feet.

radius (ft)	Design Speed (mph)								
	45			50			55		
	e	L	x	e	L	x	e	L	x
2000	4	133	67	4.4	158	72	5	192	77
1820	4.2	140	67	4.6	166	72	5.2	199	77
1700	4.2	140	67	4.8	173	72	5.4	207	77
1660	4.4	147	67	4.8	173	72	5.4	207	77

L and x can be determined for roadways widths other than those in the tables. Simply multiply the value for L or x obtained from the tables based on a 12 foot roadway width (Tables 1, 2, 8, and 9) by the appropriate adjustment factor (α). See Section 2A-2 for information on determining the adjustment factor.

Tables 8 and 9 contain values for e_{max} of 8% and a pavement width of 12'. Use these tables are primarily used for 3R and 4R projects. For pavements width greater than 12', refer to Section 2A-2 for adjustment factors for superelevation runoff and runout lengths.

Table 10 contains values for a range of superelevation rates for low speed roadways, for which Method 2 is used to distribute side friction and superelevation.



Do not use superelevation rates less than the values shown in the following tables. Designers may exceed the values shown. For example, a 50 mph curve with maximum superelevation rate of 6 percent and radius of 1800 feet could use a superelevation rate of 4.6 percent or higher.

Summary of Tables:

Table 1: Low Speed, Two-Lane Undivided Roadways ($w = 12$ feet), $e_{\max} = 6\%$, normal cross slope (2%)

Table 2: High Speed, Two-Lane Undivided Roadways ($w = 12$ feet), $e_{\max} = 6\%$, normal cross slope (2%)

Table 3: High Speed, Four-Lane Divided Roadways ($w = 24$ feet), $e_{\max} = 6\%$, normal cross slope (2%)

Table 4: High Speed, Six-Lane Divided Roadways ($w = 36$ feet), $e_{\max} = 6\%$, normal cross slope (2.5%)

Table 5: High Speed, Eight-Lane Divided Roadways ($w = 48$ feet), $e_{\max} = 6\%$, normal cross slope (2.5%)

Table 6: Ramps ($w = 16$ feet) and Loops ($w = 18$ feet), $e_{\max} = 6\%$, normal cross slope (2%)

Table 7: Ramps ($w = 24$ feet), $e_{\max} = 6\%$, normal cross slope (2%)

Table 8: Low Speed Roadways ($w = 12$ feet), $e_{\max} = 8\%$, normal cross slope (2%)

Table 9: High Speed Roadways ($w = 12$ feet), $e_{\max} = 8\%$, normal cross slope (2%)

Table 10: Minimum Radii, Low Speed Roadways

Table 1: Low Speed, Two-Lane Undivided Roadways (w = 12 feet), e_{max} = 6%, NC = 2%

radius (ft)	Design Speed (mph)																																
	25			30			35			40			45																				
	e	L	x	e	L	x	e	L	x	e	L	x	e	L	x																		
5500	NC	0	0	NC	0	0	NC	0	0	NC	0	0	NC	0	0																		
5250	NC	0	0	NC	0	0	NC	0	0	NC	0	0	RC	44	44																		
5000	NC	0	0	NC	0	0	NC	0	0	NC	0	0	RC	44	44																		
4750	NC	0	0	NC	0	0	NC	0	0	NC	0	0	RC	44	44																		
4680	NC	0	0	NC	0	0	NC	0	0	NC	0	0	RC	44	44																		
4500	NC	0	0	NC	0	0	NC	0	0	NC	0	0	2.2	49	44																		
4250	NC	0	0	NC	0	0	NC	0	0	NC	0	0	2.2	49	44																		
4000	NC	0	0	NC	0	0	NC	0	0	RC	41	41	2.4	53	44																		
3770	NC	0	0	NC	0	0	NC	0	0	RC	41	41	2.4	53	44																		
3500	NC	0	0	NC	0	0	NC	0	0	2.2	45	41	2.6	58	44																		
3240	NC	0	0	NC	0	0	RC	39	39	2.4	50	41	2.8	62	44																		
3050	NC	0	0	NC	0	0	RC	39	39	2.4	50	41	3.0	67	44																		
2950	NC	0	0	NC	0	0	RC	39	39	2.6	54	41	3.0	67	44																		
2850	NC	0	0	NC	0	0	2.2	43	39	2.6	54	41	3.0	67	44																		
2700	NC	0	0	NC	0	0	2.2	43	39	2.8	58	41	3.2	71	44																		
2500	NC	0	0	RC	36	36	2.4	46	39	2.8	58	41	3.4	75	44																		
2480	NC	0	0	RC	36	36	2.4	46	39	3.0	62	41	3.4	75	44																		
2300	NC	0	0	RC	36	36	2.6	50	39	3.0	62	41	3.6	80	44																		
2240	NC	0	0	RC	36	36	2.6	50	39	3.2	66	41	3.6	80	44																		
2140	NC	0	0	2.2	40	36	2.6	50	39	3.2	66	41	3.8	84	44																		
2040	NC	0	0	2.2	40	36	2.8	54	39	3.4	70	41	3.8	84	44																		
2000	NC	0	0	2.2	40	36	2.8	54	39	3.4	70	41	4.0	89	44																		
1820	RC	34	34	2.4	44	36	3.0	58	39	3.6	74	41	4.2	93	44																		
1700	RC	34	34	2.6	47	36	3.2	62	39	3.8	78	41	4.2	93	44																		
1660	RC	34	34	2.6	47	36	3.2	62	39	3.8	78	41	4.4	98	44																		
1530	2.2	38	34	2.8	51	36	3.4	66	39	4.0	83	41	4.6	102	44																		
1400	2.4	41	34	3.0	55	36	3.6	70	39	4.2	87	41	4.8	107	44																		
1330	2.4	41	34	3.0	55	36	3.6	70	39	4.2	87	41	4.8	107	44																		
1265	2.6	45	34	3.2	58	36	3.8	73	39	4.4	91	41	5.0	111	44																		
1200	2.6	45	34	3.2	58	36	3.8	73	39	4.4	91	41	5.0	111	44																		
1120	2.8	48	34	3.4	62	36	4.0	77	39	4.6	95	41	5.2	115	44																		
1060	2.8	48	34	3.6	66	36	4.2	81	39	4.8	99	41	5.4	120	44																		
1025	3.0	51	34	3.6	66	36	4.2	81	39	4.8	99	41	5.4	120	44																		
950	3.0	51	34	3.8	69	36	4.4	85	39	5.0	103	41	5.6	124	44																		
900	3.2	55	34	3.8	69	36	4.4	85	39	5.2	107	41	5.8	129	44																		
833	3.4	58	34	4.0	73	36	4.6	89	39	5.2	107	41	5.8	129	44																		
810	3.4	58	34	4.0	73	36	4.6	89	39	5.4	111	41	5.8	129	44																		
750	3.6	62	34	4.2	77	36	4.8	93	39	5.6	116	41	6.0	133	44																		
700	3.6	62	34	4.2	77	36	5.0	97	39	5.6	116	41	6.0	133	44																		
643	3.8	65	34	4.4	80	36	5.2	100	39	5.8	120	41	6.0	133	44																		
620	3.8	65	34	4.4	80	36	5.2	100	39	5.8	120	41	R _{min} = 643																				
575	4.0	69	34	4.6	84	36	5.4	104	39	6.0	124	41																					
500	4.2	72	34	5.0	91	36	5.6	108	39	6.0	124	41	R _{min} = 485																				
485	4.2	72	34	5.0	91	36	5.8	112	39	6.0	124	41																					
460	4.2	72	34	5.0	91	36	5.8	112	39	R _{min} = 340																							
425	4.4	76	34	5.2	95	36	6.0	116	39																								
375	4.6	79	34	5.4	98	36	6.0	116	39	R _{min} = 231																							
340	4.8	82	34	5.6	102	36	6.0	116	39																								
320	5.0	86	34	5.8	106	36	R _{min} = 144																										
300	5.0	86	34	5.8	106	36																											
275	5.2	89	34	6.0	109	36	R _{min} = 144																										
250	5.4	93	34	6.0	109	36																											
231	5.6	96	34	6.0	109	36	R _{min} = 144																										
225	5.6	96	34	R _{min} = 144																													
200	5.8	100	34																														
144	6.0	103	34	R _{min} = 144																													

NC = Normal Crown
RC = Remove Crown

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Table 2: High Speed, Two-Lane Undivided Roadways (w = 12 feet), e_{max} = 6%, NC = 2%

radius (ft)	50			55			60			65			70			75		
	e	L	x	e	L	x	e	L	x	e	L	x	e	L	x	e	L	x
14000	NC	0	0	NC	0	0	NC	0	0	NC	0	0	NC	0	0	NC	0	0
12900	NC	0	0	NC	0	0	NC	0	0	NC	0	0	NC	0	0	NC	0	0
11500	NC	0	0	NC	0	0	NC	0	0	NC	0	0	RC	60	60	RC	63	63
11000	NC	0	0	NC	0	0	NC	0	0	NC	0	0	RC	60	60	2.2	69	63
10300	NC	0	0	NC	0	0	NC	0	0	NC	0	0	RC	60	60	2.4	76	63
9500	NC	0	0	NC	0	0	NC	0	0	RC	56	56	2.2	66	60	2.4	76	63
9130	NC	0	0	NC	0	0	NC	0	0	RC	56	56	2.4	72	60	2.6	82	63
8500	NC	0	0	NC	0	0	RC	53	53	2.2	62	56	2.4	72	60	2.8	88	63
8060	NC	0	0	NC	0	0	RC	53	53	2.4	67	56	2.6	78	60	2.8	88	63
7500	NC	0	0	RC	51	51	2.2	59	53	2.4	67	56	2.8	84	60	3.0	95	63
7000	NC	0	0	RC	51	51	2.4	64	53	2.6	73	56	3.0	90	60	3.2	101	63
6820	NC	0	0	RC	51	51	2.4	64	53	2.6	73	56	3.0	90	60	3.2	101	63
6500	NC	0	0	2.2	56	51	2.6	69	53	2.8	78	56	3.2	96	60	3.4	107	63
6250	RC	48	48	2.2	56	51	2.6	69	53	2.8	78	56	3.2	96	60	3.6	114	63
6000	RC	48	48	2.4	61	51	2.6	69	53	3.0	84	56	3.4	102	60	3.6	114	63
5700	RC	48	48	2.4	61	51	2.8	75	53	3.0	84	56	3.4	102	60	3.8	120	63
5500	2.2	53	48	2.6	66	51	2.8	75	53	3.2	89	56	3.6	108	60	4.0	126	63
5250	2.2	53	48	2.6	66	51	3.0	80	53	3.4	95	56	3.6	108	60	4.0	126	63
5000	2.4	58	48	2.8	72	51	3.0	80	53	3.4	95	56	3.8	114	60	4.2	133	63
4750	2.4	58	48	2.8	72	51	3.2	85	53	3.6	101	56	4.0	120	60	4.4	139	63
4680	2.4	58	48	2.8	72	51	3.2	85	53	3.6	101	56	4.0	120	60	4.4	139	63
4500	2.6	62	48	3.0	77	51	3.4	91	53	3.8	106	56	4.2	126	60	4.6	145	63
4250	2.6	62	48	3.0	77	51	3.4	91	53	3.8	106	56	4.4	132	60	4.8	151	63
4000	2.8	67	48	3.2	82	51	3.6	96	53	4.0	112	56	4.6	138	60	5.0	158	63
3770	3.0	72	48	3.4	87	51	3.8	101	53	4.2	117	56	4.8	144	60	5.2	164	63
3500	3.0	72	48	3.6	92	51	4.0	107	53	4.4	123	56	5.0	150	60	5.4	170	63
3240	3.2	77	48	3.8	97	51	4.2	112	53	4.6	129	56	5.2	156	60	5.6	177	63
3050	3.4	82	48	3.8	97	51	4.4	117	53	4.8	134	56	5.4	162	60	5.8	183	63
2950	3.4	82	48	4.0	102	51	4.4	117	53	5.0	140	56	5.4	162	60	6.0	189	63
2850	3.6	86	48	4.0	102	51	4.6	123	53	5.0	140	56	5.6	168	60	6.0	189	63
2700	3.8	91	48	4.2	107	51	4.8	128	53	5.2	145	56	5.8	174	60	6.0	189	63
2500	3.8	91	48	4.4	112	51	5.0	133	53	5.4	151	56	5.8	174	60	6.0	189	63
2480	4.0	96	48	4.4	112	51	5.0	133	53	5.4	151	56	5.8	174	60	R _{min} = 2500		
2300	4.0	96	48	4.6	118	51	5.2	139	53	5.6	157	56	6.0	180	60	R _{min} = 2040		
2240	4.2	101	48	4.6	118	51	5.2	139	53	5.6	157	56	6.0	180	60			
2140	4.2	101	48	4.8	123	51	5.4	144	53	5.8	162	56	6.0	180	60	R _{min} = 1660		
2040	4.4	106	48	5.0	128	51	5.4	144	53	5.8	162	56	6.0	180	60			
2000	4.4	106	48	5.0	128	51	5.4	144	53	6.0	168	56	R _{min} = 1330			R _{min} = 1060		
1820	4.6	110	48	5.2	133	51	5.8	155	53	6.0	168	56						
1700	4.8	115	48	5.4	138	51	5.8	155	53	6.0	168	56	R _{min} = 1660			R _{min} = 1060		
1660	4.8	115	48	5.4	138	51	5.8	155	53	6.0	168	56						
1530	5.0	120	48	5.6	143	51	6.0	160	53	R _{min} = 1660			R _{min} = 1060			R _{min} = 833		
1400	5.2	125	48	5.8	148	51	6.0	160	53									
1330	5.4	130	48	5.8	148	51	6.0	160	53	R _{min} = 1330			R _{min} = 1060			R _{min} = 833		
1265	5.6	134	48	6.0	153	51	R _{min} = 1330			R _{min} = 1060			R _{min} = 833			R _{min} = 833		
1200	5.6	134	48	6.0	153	51							R _{min} = 833			R _{min} = 833		
1120	5.8	139	48	6.0	153	51	R _{min} = 1060			R _{min} = 1060			R _{min} = 833			R _{min} = 833		
1060	5.8	139	48	6.0	153	51							R _{min} = 833			R _{min} = 833		
1025	6.0	144	48	R _{min} = 1060			R _{min} = 1060			R _{min} = 1060			R _{min} = 833			R _{min} = 833		
950	6.0	144	48										R _{min} = 833			R _{min} = 833		
900	6.0	144	48	R _{min} = 833			R _{min} = 833			R _{min} = 833			R _{min} = 833			R _{min} = 833		
833	6.0	144	48										R _{min} = 833			R _{min} = 833		

NC = Normal Crown
RC = Remove Crown

Spiral curve transitions are desirable for curves below the red line

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Table 3: High Speed, Four-Lane Divided Roadways (w = 24 feet), e_{max} = 6%, NC = 2%

radius (ft)	50			55			60			65			70			75					
	e	L	x	e	L	x	e	L	x	e	L	x	e	L	x	e	L	x			
14000	NC	0	0	NC	0	0	NC	0	0	NC	0	0	NC	0	0	NC	0	0			
12900	NC	0	0	NC	0	0	NC	0	0	NC	0	0	NC	0	0	NC	0	0			
11500	NC	0	0	NC	0	0	NC	0	0	NC	0	0	RC	90	90	RC	95	95			
11000	NC	0	0	NC	0	0	NC	0	0	NC	0	0	RC	90	90	2.2	104	95			
10300	NC	0	0	NC	0	0	NC	0	0	NC	0	0	RC	90	90	2.4	114	95			
9500	NC	0	0	NC	0	0	NC	0	0	RC	84	84	2.2	99	90	2.4	114	95			
9130	NC	0	0	NC	0	0	NC	0	0	RC	84	84	2.4	108	90	2.6	123	95			
8500	NC	0	0	NC	0	0	RC	80	80	2.2	92	84	2.4	108	90	2.8	133	95			
8060	NC	0	0	NC	0	0	RC	80	80	2.4	101	84	2.6	117	90	2.8	133	95			
7500	NC	0	0	RC	77	77	2.2	88	80	2.4	101	84	2.8	126	90	3.0	142	95			
7000	NC	0	0	RC	77	77	2.4	96	80	2.6	109	84	3.0	135	90	3.2	151	95			
6820	NC	0	0	RC	77	77	2.4	96	80	2.6	109	84	3.0	135	90	3.2	151	95			
6500	NC	0	0	2.2	84	77	2.6	104	80	2.8	117	84	3.2	144	90	3.4	161	95			
6250	RC	72	72	2.2	84	77	2.6	104	80	2.8	117	84	3.2	144	90	3.6	170	95			
6000	RC	72	72	2.4	92	77	2.6	104	80	3.0	126	84	3.4	153	90	3.6	170	95			
5700	RC	72	72	2.4	92	77	2.8	112	80	3.0	126	84	3.4	153	90	3.8	180	95			
5500	2.2	79	72	2.6	100	77	2.8	112	80	3.2	134	84	3.6	162	90	4.0	189	95			
5250	2.2	79	72	2.6	100	77	3.0	120	80	3.4	143	84	3.6	162	90	4.0	189	95			
5000	2.4	86	72	2.8	107	77	3.0	120	80	3.4	143	84	3.8	171	90	4.2	199	95			
4750	2.4	86	72	2.8	107	77	3.2	128	80	3.6	151	84	4.0	180	90	4.4	208	95			
4680	2.4	86	72	2.8	107	77	3.2	128	80	3.6	151	84	4.0	180	90	4.4	208	95			
4500	2.6	94	72	3.0	115	77	3.4	136	80	3.8	159	84	4.2	189	90	4.6	218	95			
4250	2.6	94	72	3.0	115	77	3.4	136	80	3.8	159	84	4.4	198	90	4.8	227	95			
4000	2.8	101	72	3.2	123	77	3.6	144	80	4.0	168	84	4.6	207	90	5.0	237	95			
3770	3.0	108	72	3.4	130	77	3.8	152	80	4.2	176	84	4.8	216	90	5.2	246	95			
3500	3.0	108	72	3.6	138	77	4.0	160	80	4.4	185	84	5.0	225	90	5.4	256	95			
3240	3.2	115	72	3.8	146	77	4.2	168	80	4.6	193	84	5.2	234	90	5.6	265	95			
3050	3.4	122	72	3.8	146	77	4.4	176	80	4.8	201	84	5.4	243	90	5.8	275	95			
2950	3.4	122	72	4.0	153	77	4.4	176	80	5.0	210	84	5.4	243	90	6.0	284	95			
2850	3.6	130	72	4.0	153	77	4.6	184	80	5.0	210	84	5.6	252	90	6.0	284	95			
2700	3.8	137	72	4.2	161	77	4.8	192	80	5.2	218	84	5.8	261	90	6.0	284	95			
2500	3.8	137	72	4.4	169	77	5.0	200	80	5.4	226	84	5.8	261	90	6.0	284	95			
2480	4.0	144	72	4.4	169	77	5.0	200	80	5.4	226	84	5.8	261	90	R _{min} = 2500					
2300	4.0	144	72	4.6	176	77	5.2	208	80	5.6	235	84	6.0	270	90	R _{min} = 2040					
2240	4.2	151	72	4.6	176	77	5.2	208	80	5.6	235	84	6.0	270	90						
2140	4.2	151	72	4.8	184	77	5.4	216	80	5.8	243	84	6.0	270	90	R _{min} = 1660					
2040	4.4	158	72	5.0	192	77	5.4	216	80	5.8	243	84	6.0	270	90						
2000	4.4	158	72	5.0	192	77	5.4	216	80	6.0	252	84	R _{min} = 1330			R _{min} = 2040					
1820	4.6	166	72	5.2	199	77	5.8	232	80	6.0	252	84									
1700	4.8	173	72	5.4	207	77	5.8	232	80	6.0	252	84	R _{min} = 1060			R _{min} = 1660					
1660	4.8	173	72	5.4	207	77	5.8	232	80	6.0	252	84									
1530	5.0	180	72	5.6	215	77	6.0	240	80	R _{min} = 1330			R _{min} = 1060			R _{min} = 1330					
1400	5.2	187	72	5.8	222	77	6.0	240	80												
1330	5.4	194	72	5.8	222	77	6.0	240	80	R _{min} = 1060			R _{min} = 833			R _{min} = 1060					
1265	5.6	202	72	6.0	230	77	R _{min} = 833			R _{min} = 1060						R _{min} = 1060					
1200	5.6	202	72	6.0	230	77										R _{min} = 833					
1120	5.8	209	72	6.0	230	77	R _{min} = 833			R _{min} = 1060			R _{min} = 833			R _{min} = 833					
1060	5.8	209	72	6.0	230	77										R _{min} = 833					
1025	6.0	216	72	R _{min} = 833			R _{min} = 833			R _{min} = 1060			R _{min} = 833			R _{min} = 833					
950	6.0	216	72													R _{min} = 833					
900	6.0	216	72	R _{min} = 833			R _{min} = 833			R _{min} = 1060			R _{min} = 833			R _{min} = 833					
833	6.0	216	72													R _{min} = 833					

NC = Normal Crown
 RC = Remove Crown
 Spiral curve transitions are desirable for curves below the red line

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Table 4: High Speed, Six-Lane Divided Roadways (w = 36 feet), e_{max} = 6%, NC = 2.5%

radius (ft)	50			55			60			65			70			75		
	e	L	x	e	L	x	e	L	x	e	L	x	e	L	x	e	L	x
14000	NC	0	0	NC	0	0	NC	0	0	NC	0	0	NC	0	0	NC	0	0
12900	NC	0	0	NC	0	0	NC	0	0	NC	0	0	NC	0	0	NC	0	0
11500	NC	0	0	NC	0	0	NC	0	0	NC	0	0	2.0	120	150	2.0	126	158
11000	NC	0	0	NC	0	0	NC	0	0	NC	0	0	2.0	120	150	2.2	139	158
10300	NC	0	0	NC	0	0	NC	0	0	NC	0	0	2.0	120	150	2.4	151	158
9500	NC	0	0	NC	0	0	NC	0	0	2.0	112	140	2.2	132	150	2.4	151	158
9130	NC	0	0	NC	0	0	NC	0	0	2.0	112	140	2.4	144	150	2.6	164	158
8500	NC	0	0	NC	0	0	2.0	107	133	2.2	123	140	2.4	144	150	2.8	177	158
8060	NC	0	0	NC	0	0	2.0	107	133	2.4	134	140	2.6	156	150	2.8	177	158
7500	NC	0	0	2.0	102	128	2.2	117	133	2.4	134	140	2.8	168	150	3.0	189	158
7000	NC	0	0	2.0	102	128	2.4	128	133	2.6	145	140	3.0	180	150	3.2	202	158
6820	NC	0	0	2.0	102	128	2.4	128	133	2.6	145	140	3.0	180	150	3.2	202	158
6500	NC	0	0	2.2	112	128	2.6	139	133	2.8	157	140	3.2	192	150	3.4	215	158
6250	2.0	96	120	2.2	112	128	2.6	139	133	2.8	157	140	3.2	192	150	3.6	227	158
6000	2.0	96	120	2.4	123	128	2.6	139	133	3.0	168	140	3.4	204	150	3.6	227	158
5700	2.0	96	120	2.4	123	128	2.8	149	133	3.0	168	140	3.4	204	150	3.8	240	158
5500	2.2	106	120	2.6	133	128	2.8	149	133	3.2	179	140	3.6	216	150	4.0	252	158
5250	2.2	106	120	2.6	133	128	3.0	160	133	3.4	190	140	3.6	216	150	4.0	252	158
5000	2.4	115	120	2.8	143	128	3.0	160	133	3.4	190	140	3.8	228	150	4.2	265	158
4750	2.4	115	120	2.8	143	128	3.2	170	133	3.6	201	140	4.0	240	150	4.4	278	158
4680	2.4	115	120	2.8	143	128	3.2	170	133	3.6	201	140	4.0	240	150	4.4	278	158
4500	2.6	125	120	3.0	153	128	3.4	181	133	3.8	212	140	4.2	252	150	4.6	290	158
4250	2.6	125	120	3.0	153	128	3.4	181	133	3.8	212	140	4.4	264	150	4.8	303	158
4000	2.8	134	120	3.2	164	128	3.6	192	133	4.0	224	140	4.6	276	150	5.0	316	158
3770	3.0	144	120	3.4	174	128	3.8	202	133	4.2	235	140	4.8	288	150	5.2	328	158
3500	3.0	144	120	3.6	184	128	4.0	213	133	4.4	246	140	5.0	300	150	5.4	341	158
3240	3.2	154	120	3.8	194	128	4.2	224	133	4.6	257	140	5.2	312	150	5.6	353	158
3050	3.4	163	120	3.8	194	128	4.4	234	133	4.8	268	140	5.4	324	150	5.8	366	158
2950	3.4	163	120	4.0	204	128	4.4	234	133	5.0	280	140	5.4	324	150	6.0	379	158
2850	3.6	173	120	4.0	204	128	4.6	245	133	5.0	280	140	5.6	336	150	6.0	379	158
2700	3.8	182	120	4.2	215	128	4.8	256	133	5.2	291	140	5.8	348	150	6.0	379	158
2500	3.8	182	120	4.4	225	128	5.0	266	133	5.4	302	140	5.8	348	150	6.0	379	158
2480	4.0	192	120	4.4	225	128	5.0	266	133	5.4	302	140	5.8	348	150	R _{min} = 2500		
2300	4.0	192	120	4.6	235	128	5.2	277	133	5.6	313	140	6.0	360	150			
2240	4.2	202	120	4.6	235	128	5.2	277	133	5.6	313	140	6.0	360	150			
2140	4.2	202	120	4.8	245	128	5.4	288	133	5.8	324	140	6.0	360	150			
2040	4.4	211	120	5.0	256	128	5.4	288	133	5.8	324	140	6.0	360	150			
2000	4.4	211	120	5.0	256	128	5.4	288	133	6.0	336	140	R _{min} = 2040					
1820	4.6	221	120	5.2	266	128	5.8	309	133	6.0	336	140						
1700	4.8	230	120	5.4	276	128	5.8	309	133	6.0	336	140						
1660	4.8	230	120	5.4	276	128	5.8	309	133	6.0	336	140						
1530	5.0	240	120	5.6	286	128	6.0	320	133	R _{min} = 1660								
1400	5.2	250	120	5.8	296	128	6.0	320	133									
1330	5.4	259	120	5.8	296	128	6.0	320	133									
1265	5.6	269	120	6.0	307	128	R _{min} = 1330											
1200	5.6	269	120	6.0	307	128												
1120	5.8	278	120	6.0	307	128												
1060	5.8	278	120	6.0	307	128												
1025	6.0	288	120	R _{min} = 1060														
950	6.0	288	120															
900	6.0	288	120															
833	6.0	288	120	R _{min} = 833														

NC = Normal Crown
RC = Remove Crown

Spiral curve transitions are desirable for curves below the red line

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Table 5: High Speed, Eight-Lane Divided Roadways (w = 48 feet), e_{max} = 6%, NC = 2.5%

radius (ft)	50			55			60			65			70			75		
	e	L	x	e	L	x	e	L	x	e	L	x	e	L	x	e	L	x
14000	NC	0	0	NC	0	0	NC	0	0	NC	0	0	NC	0	0	NC	0	0
12900	NC	0	0	NC	0	0	NC	0	0	NC	0	0	NC	0	0	NC	0	0
11500	NC	0	0	NC	0	0	NC	0	0	NC	0	0	2.0	150	188	2.0	158	197
11000	NC	0	0	NC	0	0	NC	0	0	NC	0	0	2.0	150	188	2.2	174	197
10300	NC	0	0	NC	0	0	NC	0	0	NC	0	0	2.0	150	188	2.4	189	197
9500	NC	0	0	NC	0	0	NC	0	0	2.0	140	175	2.2	165	188	2.4	189	197
9130	NC	0	0	NC	0	0	NC	0	0	2.0	140	175	2.4	180	188	2.6	205	197
8500	NC	0	0	NC	0	0	2.0	133	167	2.2	154	175	2.4	180	188	2.8	221	197
8060	NC	0	0	NC	0	0	2.0	133	167	2.4	168	175	2.6	195	188	2.8	221	197
7500	NC	0	0	2.0	128	160	2.2	147	167	2.4	168	175	2.8	210	188	3.0	237	197
7000	NC	0	0	2.0	128	160	2.4	160	167	2.6	182	175	3.0	225	188	3.2	252	197
6820	NC	0	0	2.0	128	160	2.4	160	167	2.6	182	175	3.0	225	188	3.2	252	197
6500	NC	0	0	2.2	141	160	2.6	173	167	2.8	196	175	3.2	240	188	3.4	268	197
6250	2.0	120	150	2.2	141	160	2.6	173	167	2.8	196	175	3.2	240	188	3.6	284	197
6000	2.0	120	150	2.4	153	160	2.6	173	167	3.0	210	175	3.4	255	188	3.6	284	197
5700	2.0	120	150	2.4	153	160	2.8	186	167	3.0	210	175	3.4	255	188	3.8	300	197
5500	2.2	132	150	2.6	166	160	2.8	186	167	3.2	224	175	3.6	270	188	4.0	316	197
5250	2.2	132	150	2.6	166	160	3.0	200	167	3.4	238	175	3.6	270	188	4.0	316	197
5000	2.4	144	150	2.8	179	160	3.0	200	167	3.4	238	175	3.8	285	188	4.2	331	197
4750	2.4	144	150	2.8	179	160	3.2	213	167	3.6	252	175	4.0	300	188	4.4	347	197
4680	2.4	144	150	2.8	179	160	3.2	213	167	3.6	252	175	4.0	300	188	4.4	347	197
4500	2.6	156	150	3.0	192	160	3.4	226	167	3.8	266	175	4.2	315	188	4.6	363	197
4250	2.6	156	150	3.0	192	160	3.4	226	167	3.8	266	175	4.4	330	188	4.8	379	197
4000	2.8	168	150	3.2	204	160	3.6	240	167	4.0	280	175	4.6	345	188	5.0	395	197
3770	3.0	180	150	3.4	217	160	3.8	253	167	4.2	294	175	4.8	360	188	5.2	410	197
3500	3.0	180	150	3.6	230	160	4.0	266	167	4.4	308	175	5.0	375	188	5.4	426	197
3240	3.2	192	150	3.8	243	160	4.2	280	167	4.6	322	175	5.2	390	188	5.6	442	197
3050	3.4	204	150	3.8	243	160	4.4	293	167	4.8	336	175	5.4	405	188	5.8	458	197
2950	3.4	204	150	4.0	256	160	4.4	293	167	5.0	350	175	5.4	405	188	6.0	473	197
2850	3.6	216	150	4.0	256	160	4.6	306	167	5.0	350	175	5.6	420	188	6.0	473	197
2700	3.8	228	150	4.2	268	160	4.8	320	167	5.2	363	175	5.8	435	188	6.0	473	197
2500	3.8	228	150	4.4	281	160	5.0	333	167	5.4	377	175	5.8	435	188	6.0	473	197
2480	4.0	240	150	4.4	281	160	5.0	333	167	5.4	377	175	5.8	435	188	R _{min} = 2500		
2300	4.0	240	150	4.6	294	160	5.2	346	167	5.6	391	175	6.0	450	188			
2240	4.2	252	150	4.6	294	160	5.2	346	167	5.6	391	175	6.0	450	188			
2140	4.2	252	150	4.8	307	160	5.4	360	167	5.8	405	175	6.0	450	188			
2040	4.4	264	150	5.0	320	160	5.4	360	167	5.8	405	175	6.0	450	188			
2000	4.4	264	150	5.0	320	160	5.4	360	167	6.0	419	175	R _{min} = 2040					
1820	4.6	276	150	5.2	332	160	5.8	386	167	6.0	419	175						
1700	4.8	288	150	5.4	345	160	5.8	386	167	6.0	419	175						
1660	4.8	288	150	5.4	345	160	5.8	386	167	6.0	419	175						
1530	5.0	300	150	5.6	358	160	6.0	400	167	R _{min} = 1660								
1400	5.2	312	150	5.8	371	160	6.0	400	167									
1330	5.4	324	150	5.8	371	160	6.0	400	167									
1265	5.6	336	150	6.0	383	160	R _{min} = 1330											
1200	5.6	336	150	6.0	383	160												
1120	5.8	348	150	6.0	383	160												
1060	5.8	348	150	6.0	383	160												
1025	6.0	360	150	R _{min} = 1060														
950	6.0	360	150															
900	6.0	360	150															
833	6.0	360	150	R _{min} = 833														

NC = Normal Crown
RC = Remove Crown

Spiral curve transitions are desirable for curves below the red line

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Table 6: Ramps (w = 16 feet) and Loops (w = 18 feet), e_{max} = 6%, NC = 2%

radius (ft)	30			35			40			45			50			55			60		
	e	L	x	e	L	x	e	L	x	e	L	x	e	L	x	e	L	x	e	L	x
9130	NC	0	0	NC	0	0	NC	0	0	NC	0	0	NC	0	0	NC	0	0	NC	0	0
8500	NC	0	0	NC	0	0	NC	0	0	NC	0	0	NC	0	0	NC	0	0	RC	62	62
8060	NC	0	0	NC	0	0	NC	0	0	NC	0	0	NC	0	0	NC	0	0	RC	62	62
7500	NC	0	0	NC	0	0	NC	0	0	NC	0	0	NC	0	0	RC	60	60	2.2	68	62
7000	NC	0	0	NC	0	0	NC	0	0	NC	0	0	NC	0	0	RC	60	60	2.4	75	62
6820	NC	0	0	NC	0	0	NC	0	0	NC	0	0	NC	0	0	RC	60	60	2.4	75	62
6500	NC	0	0	NC	0	0	NC	0	0	NC	0	0	NC	0	0	2.2	66	60	2.6	81	62
6250	NC	0	0	NC	0	0	NC	0	0	NC	0	0	RC	56	56	2.2	66	60	2.6	81	62
6000	NC	0	0	NC	0	0	NC	0	0	NC	0	0	RC	56	56	2.4	72	60	2.6	81	62
5700	NC	0	0	NC	0	0	NC	0	0	NC	0	0	RC	56	56	2.4	72	60	2.8	87	62
5500	NC	0	0	NC	0	0	NC	0	0	NC	0	0	2.2	62	56	2.6	78	60	2.8	87	62
5250	NC	0	0	NC	0	0	NC	0	0	RC	52	52	2.2	62	56	2.6	78	60	3.0	93	62
5000	NC	0	0	NC	0	0	NC	0	0	RC	52	52	2.4	67	56	2.8	83	60	3.0	93	62
4750	NC	0	0	NC	0	0	NC	0	0	RC	52	52	2.4	67	56	2.8	83	60	3.2	99	62
4680	NC	0	0	NC	0	0	NC	0	0	RC	52	52	2.4	67	56	2.8	83	60	3.2	99	62
4500	NC	0	0	NC	0	0	NC	0	0	2.2	57	52	2.6	73	56	3.0	89	60	3.4	106	62
4250	NC	0	0	NC	0	0	NC	0	0	2.2	57	52	2.6	73	56	3.0	89	60	3.4	106	62
4000	NC	0	0	NC	0	0	RC	48	48	2.4	62	52	2.8	78	56	3.2	95	60	3.6	112	62
3770	NC	0	0	NC	0	0	RC	48	48	2.4	62	52	3.0	84	56	3.4	101	60	3.8	118	62
3500	NC	0	0	NC	0	0	2.2	53	48	2.6	67	52	3.0	84	56	3.6	107	60	4.0	124	62
3240	NC	0	0	RC	45	45	2.4	58	48	2.8	73	52	3.2	90	56	3.8	113	60	4.2	131	62
3050	NC	0	0	RC	45	45	2.4	58	48	3.0	78	52	3.4	95	56	3.8	113	60	4.4	137	62
2950	NC	0	0	RC	45	45	2.6	63	48	3.0	78	52	3.4	95	56	4.0	119	60	4.4	137	62
2850	NC	0	0	2.2	50	45	2.6	63	48	3.0	78	52	3.6	101	56	4.0	119	60	4.6	143	62
2700	NC	0	0	2.2	50	45	2.8	67	48	3.2	83	52	3.8	106	56	4.2	125	60	4.8	149	62
2500	RC	43	43	2.4	54	45	2.8	67	48	3.4	88	52	3.8	106	56	4.4	131	60	5.0	155	62
2480	RC	43	43	2.4	54	45	3.0	72	48	3.4	88	52	4.0	112	56	4.4	131	60	5.0	155	62
2300	RC	43	43	2.6	59	45	3.0	72	48	3.6	93	52	4.0	112	56	4.6	137	60	5.2	162	62
2240	RC	43	43	2.6	59	45	3.2	77	48	3.6	93	52	4.2	118	56	4.6	137	60	5.2	162	62
2140	2.2	47	43	2.6	59	45	3.2	77	48	3.8	98	52	4.2	118	56	4.8	143	60	5.4	168	62
2040	2.2	47	43	2.8	63	45	3.4	82	48	3.8	98	52	4.4	123	56	5.0	149	60	5.4	168	62
2000	2.2	47	43	2.8	63	45	3.4	82	48	4.0	104	52	4.4	123	56	5.0	149	60	5.4	168	62
1820	2.4	51	43	3.0	68	45	3.6	87	48	4.2	109	52	4.6	129	56	5.2	155	60	5.8	180	62
1700	2.6	55	43	3.2	72	45	3.8	92	48	4.2	109	52	4.8	134	56	5.4	161	60	5.8	180	62
1660	2.6	55	43	3.2	72	45	3.8	92	48	4.4	114	52	4.8	134	56	5.4	161	60	5.8	180	62
1530	2.8	60	43	3.4	77	45	4.0	96	48	4.6	119	52	5.0	140	56	5.6	167	60	6.0	186	62
1400	3.0	64	43	3.6	81	45	4.2	101	48	4.8	124	52	5.2	146	56	5.8	173	60	6.0	186	62
1330	3.0	64	43	3.6	81	45	4.2	101	48	4.8	124	52	5.4	151	56	5.8	173	60	6.0	186	62
1265	3.2	68	43	3.8	86	45	4.4	106	48	5.0	130	52	5.6	157	56	6.0	179	60	Rmin = 1330		
1200	3.2	68	43	3.8	86	45	4.4	106	48	5.0	130	52	5.6	157	56	6.0	179	60			
1120	3.4	72	43	4.0	90	45	4.6	111	48	5.2	135	52	5.8	162	56	6.0	179	60			
1060	3.6	77	43	4.2	95	45	4.8	116	48	5.4	140	52	5.8	162	56	6.0	179	60			
1025	3.6	77	43	4.2	95	45	4.8	116	48	5.4	140	52	6.0	168	56	Rmin = 1060					
950	3.8	81	43	4.4	99	45	5.0	120	48	5.6	145	52	6.0	168	56						
900	3.8	81	43	4.4	99	45	5.2	125	48	5.8	150	52	6.0	168	56						
833	4.0	85	43	4.6	104	45	5.2	125	48	5.8	150	52	6.0	168	56						
810	4.0	85	43	4.6	104	45	5.4	130	48	5.8	150	52	Rmin = 833								
750	4.2	89	43	4.8	108	45	5.6	135	48	6.0	155	52									
700	4.2	89	43	5.0	113	45	5.6	135	48	6.0	155	52									
643	4.4	94	43	5.2	117	45	5.8	140	48	6.0	155	52									
620	4.4	94	43	5.2	117	45	5.8	140	48	Rmin = 643											
575	4.6	98	43	5.4	122	45	6.0	144	48												
500	5.0	106	43	5.6	126	45	6.0	144	48												
485	5.0	106	43	5.8	131	45	6.0	144	48												
460	5.0	106	43	5.8	131	45	Rmin = 485														
425	5.2	111	43	6.0	135	45															
375	5.4	115	43	6.0	135	45															
340	5.6	119	43	6.0	135	45															
320	5.8	123	43	Rmin = 340																	
300	5.8	123	43																		
275	6.0	128	43																		
250	6.0	128	43																		
231	6.0	128	43	Rmin = 231																	

NC = Normal Crown
RC = Remove Crown

*Note: Pavement width of 16' will not accommodate offtracking if radius is less than 250'					
Design Speed	Radius	Width	e	L	x
mph	ft.	ft.	%	ft.	ft.
25	150	18	6	128	43
30	250	18	6	137	46
35	350	16	6	135	45

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Table 7: Ramps (w = 24 feet), e_{max} = 6%, normal cross slope (2%)

radius (ft)	Design Speed (mph)																				
	30			35			40			45			50			55			60		
	e	L	x	e	L	x	e	L	x	e	L	x	e	L	x	e	L	x	e	L	x
9130	NC	0	0	NC	0	0	NC	0	0	NC	0	0	NC	0	0	NC	0	0	NC	0	0
8500	NC	0	0	NC	0	0	NC	0	0	NC	0	0	NC	0	0	NC	0	0	RC	80	80
8060	NC	0	0	NC	0	0	NC	0	0	NC	0	0	NC	0	0	NC	0	0	RC	80	80
7500	NC	0	0	NC	0	0	NC	0	0	NC	0	0	NC	0	0	RC	77	77	2.2	88	80
7000	NC	0	0	NC	0	0	NC	0	0	NC	0	0	NC	0	0	RC	77	77	2.4	96	80
6820	NC	0	0	NC	0	0	NC	0	0	NC	0	0	NC	0	0	RC	77	77	2.4	96	80
6500	NC	0	0	NC	0	0	NC	0	0	NC	0	0	NC	0	0	2.2	84	77	2.6	104	80
6250	NC	0	0	NC	0	0	NC	0	0	NC	0	0	RC	72	72	2.2	84	77	2.6	104	80
6000	NC	0	0	NC	0	0	NC	0	0	NC	0	0	RC	72	72	2.4	92	77	2.6	104	80
5700	NC	0	0	NC	0	0	NC	0	0	NC	0	0	RC	72	72	2.4	92	77	2.8	112	80
5500	NC	0	0	NC	0	0	NC	0	0	NC	0	0	2.2	79	72	2.6	100	77	2.8	112	80
5250	NC	0	0	NC	0	0	NC	0	0	RC	67	67	2.2	79	72	2.6	100	77	3.0	120	80
5000	NC	0	0	NC	0	0	NC	0	0	RC	67	67	2.4	86	72	2.8	107	77	3.0	120	80
4750	NC	0	0	NC	0	0	NC	0	0	RC	67	67	2.4	86	72	2.8	107	77	3.2	128	80
4680	NC	0	0	NC	0	0	NC	0	0	RC	67	67	2.4	86	72	2.8	107	77	3.2	128	80
4500	NC	0	0	NC	0	0	NC	0	0	2.2	73	67	2.6	94	72	3.0	115	77	3.4	136	80
4250	NC	0	0	NC	0	0	NC	0	0	2.2	73	67	2.6	94	72	3.0	115	77	3.4	136	80
4000	NC	0	0	NC	0	0	RC	62	62	2.4	80	67	2.8	101	72	3.2	123	77	3.6	144	80
3770	NC	0	0	NC	0	0	RC	62	62	2.4	80	67	3.0	108	72	3.4	130	77	3.8	152	80
3500	NC	0	0	NC	0	0	2.2	68	62	2.6	87	67	3.0	108	72	3.6	138	77	4.0	160	80
3240	NC	0	0	RC	58	58	2.4	74	62	2.8	93	67	3.2	115	72	3.8	146	77	4.2	168	80
3050	NC	0	0	RC	58	58	2.4	74	62	3.0	100	67	3.4	122	72	3.8	146	77	4.4	176	80
2950	NC	0	0	RC	58	58	2.6	80	62	3.0	100	67	3.4	122	72	4.0	153	77	4.4	176	80
2850	NC	0	0	2.2	64	58	2.6	80	62	3.0	100	67	3.6	130	72	4.0	153	77	4.6	184	80
2700	NC	0	0	2.2	64	58	2.8	87	62	3.2	107	67	3.8	137	72	4.2	161	77	4.8	192	80
2500	RC	55	55	2.4	70	58	2.8	87	62	3.4	113	67	3.8	137	72	4.4	169	77	5.0	200	80
2480	RC	55	55	2.4	70	58	3.0	93	62	3.4	113	67	4.0	144	72	4.4	169	77	5.0	200	80
2300	RC	55	55	2.6	75	58	3.0	93	62	3.6	120	67	4.0	144	72	4.6	176	77	5.2	208	80
2240	RC	55	55	2.6	75	58	3.2	99	62	3.6	120	67	4.2	151	72	4.6	176	77	5.2	208	80
2140	2.2	60	55	2.6	75	58	3.2	99	62	3.8	127	67	4.2	151	72	4.8	184	77	5.4	216	80
2040	2.2	60	55	2.8	81	58	3.4	105	62	3.8	127	67	4.4	158	72	5.0	192	77	5.4	216	80
2000	2.2	60	55	2.8	81	58	3.4	105	62	4.0	133	67	4.4	158	72	5.0	192	77	5.4	216	80
1820	2.4	66	55	3.0	87	58	3.6	111	62	4.2	140	67	4.6	166	72	5.2	199	77	5.8	232	80
1700	2.6	71	55	3.2	93	58	3.8	118	62	4.2	140	67	4.8	173	72	5.4	207	77	5.8	232	80
1660	2.6	71	55	3.2	93	58	3.8	118	62	4.4	147	67	4.8	173	72	5.4	207	77	5.8	232	80
1530	2.8	77	55	3.4	99	58	4.0	124	62	4.6	153	67	5.0	180	72	5.6	215	77	6.0	240	80
1400	3.0	82	55	3.6	104	58	4.2	130	62	4.8	160	67	5.2	187	72	5.8	222	77	6.0	240	80
1330	3.0	82	55	3.6	104	58	4.2	130	62	4.8	160	67	5.4	194	72	5.8	222	77	6.0	240	80
1265	3.2	88	55	3.8	110	58	4.4	136	62	5.0	167	67	5.6	202	72	6.0	230	77	Rmin = 1330		
1200	3.2	88	55	3.8	110	58	4.4	136	62	5.0	167	67	5.6	202	72	6.0	230	77			
1120	3.4	93	55	4.0	116	58	4.6	142	62	5.2	173	67	5.8	209	72	6.0	230	77			
1060	3.6	98	55	4.2	122	58	4.8	149	62	5.4	180	67	5.8	209	72	6.0	230	77			
1025	3.6	98	55	4.2	122	58	4.8	149	62	5.4	180	67	6.0	216	72	Rmin = 1060					
950	3.8	104	55	4.4	128	58	5.0	155	62	5.6	186	67	6.0	216	72						
900	3.8	104	55	4.4	128	58	5.2	161	62	5.8	193	67	6.0	216	72						
833	4.0	109	55	4.6	133	58	5.2	161	62	5.8	193	67	6.0	216	72	Rmin = 833					
810	4.0	109	55	4.6	133	58	5.4	167	62	5.8	193	67									
750	4.2	115	55	4.8	139	58	5.6	173	62	6.0	200	67									
700	4.2	115	55	5.0	145	58	5.6	173	62	6.0	200	67									
643	4.4	120	55	5.2	151	58	5.8	180	62	6.0	200	67									
620	4.4	120	55	5.2	151	58	5.8	180	62	Rmin = 643											
575	4.6	126	55	5.4	156	58	6.0	186	62												
500	5.0	137	55	5.6	162	58	6.0	186	62												
485	5.0	137	55	5.8	168	58	6.0	186	62												
460	5.0	137	55	5.8	168	58	Rmin = 485														
425	5.2	142	55	6.0	174	58															
375	5.4	148	55	6.0	174	58															
340	5.6	153	55	6.0	174	58															
320	5.8	159	55	Rmin = 340																	
300	5.8	159	55																		
275	6.0	164	55																		
250	6.0	164	55																		
231	6.0	164	55	Rmin = 231																	

NC = Normal Crown
RC = Remove Crown

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Table 8: Low Speed Roadways (w = 12 feet), e_{max} = 8%, normal cross slope (2%)

radius (ft)	Design Speed (mph)																																
	25			30			35			40			45																				
	e	L	x	e	L	x	e	L	x	e	L	x	e	L	x																		
5500	NC	0	0	NC	0	0	NC	0	0	NC	0	0	NC	0	0																		
5250	NC	0	0	NC	0	0	NC	0	0	NC	0	0	RC	44	44																		
4930	NC	0	0	NC	0	0	NC	0	0	NC	0	0	RC	44	44																		
4750	NC	0	0	NC	0	0	NC	0	0	NC	0	0	2.2	49	44																		
4600	NC	0	0	NC	0	0	NC	0	0	NC	0	0	2.2	49	44																		
4500	NC	0	0	NC	0	0	NC	0	0	NC	0	0	2.2	49	44																		
4300	NC	0	0	NC	0	0	NC	0	0	RC	41	41	2.4	53	44																		
4200	NC	0	0	NC	0	0	NC	0	0	RC	41	41	2.4	53	44																		
4000	NC	0	0	NC	0	0	NC	0	0	RC	41	41	2.6	58	44																		
3970	NC	0	0	NC	0	0	NC	0	0	RC	41	41	2.6	58	44																		
3800	NC	0	0	NC	0	0	NC	0	0	2.2	45	41	2.6	58	44																		
3700	NC	0	0	NC	0	0	NC	0	0	2.2	45	41	2.6	58	44																		
3600	NC	0	0	NC	0	0	NC	0	0	2.2	45	41	2.8	62	44																		
3500	NC	0	0	NC	0	0	NC	0	0	2.4	50	41	2.8	62	44																		
3400	NC	0	0	NC	0	0	RC	39	39	2.4	50	41	2.8	62	44																		
3300	NC	0	0	NC	0	0	RC	39	39	2.4	50	41	3.0	67	44																		
3240	NC	0	0	NC	0	0	RC	39	39	2.4	50	41	3.0	67	44																		
3200	NC	0	0	NC	0	0	RC	39	39	2.6	54	41	3.0	67	44																		
3120	NC	0	0	NC	0	0	RC	39	39	2.6	54	41	3.0	67	44																		
3000	NC	0	0	NC	0	0	2.2	43	39	2.6	54	41	3.2	71	44																		
2850	NC	0	0	NC	0	0	2.2	43	39	2.8	58	41	3.4	75	44																		
2800	NC	0	0	NC	0	0	2.2	43	39	2.8	58	41	3.4	75	44																		
2700	NC	0	0	NC	0	0	2.4	46	39	3.0	62	41	3.4	75	44																		
2670	NC	0	0	NC	0	0	2.4	46	39	3.0	62	41	3.6	80	44																		
2600	NC	0	0	RC	36	36	2.4	46	39	3.0	62	41	3.6	80	44																		
2500	NC	0	0	RC	36	36	2.6	50	39	3.2	66	41	3.8	84	44																		
2480	NC	0	0	RC	36	36	2.6	50	39	3.2	66	41	3.8	84	44																		
2400	NC	0	0	RC	36	36	2.6	50	39	3.2	66	41	3.8	84	44																		
2370	NC	0	0	RC	36	36	2.6	50	39	3.2	66	41	3.8	84	44																		
2210	NC	0	0	2.2	40	36	2.8	54	39	3.4	70	41	4.2	93	44																		
2200	NC	0	0	2.2	40	36	2.8	54	39	3.4	70	41	4.2	93	44																		
2140	NC	0	0	2.2	40	36	2.8	54	39	3.6	74	41	4.2	93	44																		
2100	NC	0	0	2.4	44	36	3.0	58	39	3.6	74	41	4.2	93	44																		
2000	NC	0	0	2.4	44	36	3.0	58	39	3.8	78	41	4.4	98	44																		
1900	RC	34	34	2.6	47	36	3.2	62	39	3.8	78	41	4.6	102	44																		
1820	RC	34	34	2.6	47	36	3.2	62	39	4.0	83	41	4.8	107	44																		
1810	RC	34	34	2.6	47	36	3.2	62	39	4.0	83	41	4.8	107	44																		
1720	RC	34	34	2.8	51	36	3.4	66	39	4.2	87	41	5.0	111	44																		
1600	2.2	38	34	3.0	55	36	3.6	70	39	4.4	91	41	5.2	115	44																		
1530	2.4	41	34	3.0	55	36	3.8	73	39	4.6	95	41	5.4	120	44																		
1480	2.4	41	34	3.0	55	36	3.8	73	39	4.6	95	41	5.4	120	44																		
1450	2.4	41	34	3.2	58	36	4.0	77	39	4.8	99	41	5.6	124	44																		
1400	2.4	41	34	3.2	58	36	4.0	77	39	4.8	99	41	5.6	124	44																		
1300	2.6	45	34	3.4	62	36	4.2	81	39	5.2	107	41	6.0	133	44																		
1265	2.8	48	34	3.6	66	36	4.4	85	39	5.2	107	41	6.0	133	44																		
1200	2.8	48	34	3.6	66	36	4.6	89	39	5.4	111	41	6.2	138	44																		
1190	2.8	48	34	3.6	66	36	4.6	89	39	5.4	111	41	6.2	138	44																		
1100	3.0	51	34	3.8	69	36	4.8	93	39	5.6	116	41	6.6	147	44																		
1050	3.2	55	34	4.0	73	36	5.0	97	39	5.8	120	41	6.8	151	44																		
1025	3.2	55	34	4.0	73	36	5.0	97	39	6.0	124	41	6.8	151	44																		
1000	3.2	55	34	4.2	77	36	5.0	97	39	6.0	124	41	6.8	151	44																		
960	3.4	58	34	4.2	77	36	5.2	100	39	6.2	128	41	7.0	155	44																		
900	3.6	62	34	4.4	80	36	5.4	104	39	6.4	132	41	7.2	160	44																		
850	3.6	62	34	4.6	84	36	5.6	108	39	6.6	136	41	7.4	164	44																		
810	3.8	65	34	4.8	88	36	5.8	112	39	6.8	140	41	7.6	169	44																		
758	4.0	69	34	5.0	91	36	6.0	116	39	7.0	144	41	7.8	173	44																		
676	4.4	76	34	5.4	98	36	6.2	120	39	7.2	149	41	8.0	178	44																		
650	4.4	76	34	5.4	98	36	6.4	124	39	7.4	153	41	8.0	178	44																		
620	4.6	79	34	5.6	102	36	6.6	128	39	7.6	157	41	8.0	178	44																		
587	4.8	82	34	5.6	102	36	6.8	131	39	7.6	157	41	8.0	178	44																		
575	4.8	82	34	5.8	106	36	6.8	131	39	7.8	161	41	R _{min} = 587																				
525	5.0	86	34	6.0	109	36	7.0	135	39	8.0	165	41																					
500	5.2	89	34	6.2	113	36	7.2	139	39	8.0	165	41	R _{min} = 444																				
460	5.4	93	34	6.4	117	36	7.4	143	39	8.0	165	41																					
444	5.4	93	34	6.4	117	36	7.6	147	39	8.0	165	41	R _{min} = 314																				
425	5.4	93	34	6.6	120	36	7.6	147	39																								
400	5.6	96	34	6.8	124	36	7.8	151	39																								
375	5.8	100	34	7.0	128	36	8.0	155	39																								
350	6.0	103	34	7.2	131	36	8.0	155	39																								
320	6.2	106	34	7.4	135	36	8.0	155	39																								
314	6.2	106	34	7.4	135	36	8.0	155	39																								
300	6.4	110	34	7.6	139	36																											
275	6.6	113	34	7.8	142	36																											
260	6.8	117	34	8.0	146	36																											
250	7.0	120	34	8.0	146	36																											
225	7.2	124	34	8.0	146	36																											
214	7.4	127	34	8.0	146	36																											
200	7.4	127	34																														
185	7.6	130	34																														
175	7.8	134	34																														
134	8.0	137	34																														

R_{min} = 134

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Table 10: Minimum Radii for Low Speed Roadways

e	Design Speed				
	25	30	35	40	45
%	R (ft)	R (ft)	R (ft)	R (ft)	R (ft)
-2.0	198	333	510	762	1039
-1.5	194	324	495	736	1000
0.0	181	300	454	667	900
1.5	170	279	419	610	818
2.0	167	273	408	593	794
2.2	165	270	404	586	785
2.4	164	268	400	580	776
2.6	163	265	396	573	767
2.8	161	263	393	567	758
3.0	160	261	389	561	750
3.2	159	259	385	556	742
3.4	158	256	382	550	734
3.6	157	254	378	544	726
3.8	155	252	375	539	718
4.0	154	250	371	533	711

Note: Superelevation may be optional on low speed urban roadways.



Transition design from a normal crown roadway to a superelevated roadway for low speed roadways, using Method 2 distribution for side friction and superelevation, is the same as high speed roadways. Refer to Section [2A-2](#) for distribution details.

Chronology of Changes to Design Manual Section:

002A-003 Superelevation Tables

- | | |
|------------|--|
| 7/18/2013 | Revised
Clarified values in tables are minimums. Deleted tables for $e_{max}=4\%$, six-lane divided roadways ($w=46$ feet), and eight-lane divided roadways ($w=58$ feet). |
| 10/29/2010 | Revised
Corrected bookmarks. |
| 8/31/2010 | Revised
Tables had incorrect values when $NC = 2.5\%$ and $e < 2.0\%$. |