TABLE V

Functions of spirals for varying degrees of curve between 2 minutes and 100 degrees for various values of "a".

Select value of a $(= \frac{D}{L})$ to correspond with value of "a" shown in table. Values of corresponding functions are then directly obtainable from the table.

Tables for the following values of "a" are given:

a = 0.1	a = 1.25	a = 5.5
a = 0.2	a = 1⅓	a = 6.0
a = 0.25	a = 1.5	a = 6.5
a = 0.3	a = 1.75	a = 7.0
a = 0.4	a = 2.0	a = 8.0
a = 0.5	a = 2.5	a = 9.0
a = 0.6	a = 3.0	a = 10.0
a = 0.7	a = 3.5	a = 12.5
a = 0.8	a = 4.0	a = 15.0
a = 0.9	a = 4.5	a = 20.0
a = 1.0	a = 5.0	a = 25.0

Revised 7/25/03

Designations X & Y have been reversed to match most software

TABLE V, THE STANDARD HIGHWAY SPIRAL

$a = 0.1$

L	D	S	q	p	χ	Ψ	C	U	V
10	0°00.6′	0°00.03′	5.00	0.00	10.00	0.00	10.00	6.67	3.33
20	0°01.2′	0°00.12′	10.00	0.00	20.00	0.00	20.00	13.33	6.67
30	0°01.8′	0°00.27′	15.00	0.00	30.00	0.00	30.00	20.00	10.00
40	0°02.4′	0°00.48′	20.00	0.00	40.00	0.00	40.00	26.67	13.33
50	0°03.0′	0°00.75′	25.00	0.00	50.00	0.00	50.00	33.33	16.67
60	0°03.6′	0°01.08′	30.00	0.00	60.00	0.01	60.00	40.00	20.00
70	0°04.2′	0°01.47′	35.00	0.00	70.00	0.01	70.00	46.67	23.33
80	0°04.8′	0°01.92′	40.00	0.00	80.00	0.01	80.00	53.33	26.67
90	0°05.4′	0°02.43′	45.00	0.00	90.00	0.02	90.00	60.00	30.00
100	0°06.0′	0°03.00′	50.00	0.01	100.00	0.03	100.00	66.67	33.33
110	0°06.6′	0°03.63′	55.00	0.01	110.00	0.04	110.00	73.33	36.67
120	0°07.2′	0°04.32′	60.00	0.01	120.00	0.05	120.00	80.00	40.00
130	0°07.8′	0°05.07′	65.00	0.02	130.00	0.06	130.00	86.67	43.33
140	0°08.4′	0°05.88′	70.00	0.02	140.00	0.08	140.00	93.33	46.67
150	0°09.0′	0°06.75′	75.00	0.02	150.00	0.10	150.00	100.00	50.00
160	0°09.6′	0°07.68′	80.00	0.03	160.00	0.12	160.00	106.67	53.33
170	0°10.2′	0°08.67′	85.00	0.04	170.00	0.14	170.00	113.33	56.67
180	0°10.8′	0°09.72′	90.00	0.04	180.00	0.17	180.00	120.00	60.00
190	0°11.4′	0°10.83′	95.00	0.05	190.00	0.20	190.00	126.67	63.33
200	0°12.0′	0°12.00′	100.00	0.06	200.00	0.23	200.00	133.33	66.67
210	0°12.6′	0°13.23′	105.00	0.07	210.00	0.27	210.00	140.00	70.00
220	0°13.2′	0°14.52′	110.00	0.08	220.00	0.31	220.00	146.67	73.33
230	0°13.8′	0°15.87′	115.00	0.09	230.00	0.35	230.00	153.33	76.67
240	0°14.4′	0°17.28′	120.00	0.10	240.00	0.40	240.00	160.00	80.00
250	0°15.0′	0°18.75′	125.00	0.11	250.00	0.45	250.00	166.67	83.33
260	0°15.6′	0°20.28′	130.00	0.13	260.00	0.51	260.00	173.33	86.67
270	0°16.2′	0°21.87′	135.00	0.14	270.00	0.57	270.00	180.00	90.00
280	0°16.8′	0°23.52′	140.00	0.16	280.00	0.64	280.00	186.67	93.33
290	0°17.4′	0°25.23′	145.00	0.18	290.00	0.71	290.00	193.33	96.67
300	0°18.0′	0°27.00′	150.00	0.20	300.00	0.79	300.00	200.00	100.00
310	0°18.6′	0°28.83′	155.00	0.22	310.00	0.87	310.00	206.67	103.33
320	0°19.2′	0°30.72′	160.00	0.24	320.00	0.95	320.00	213.33	106.67
330	0°19.8′	0°32.67′	165.00	0.26	330.00	1.05	330.00	220.00	110.00
340	0°20.4′	0°34.68′	170.00	0.29	340.00	1.14	340.00	226.67	113.33
350	0°21.0′	0°36.75′	175.00	0.31	350.00	1.25	350.00	233.33	116.67
360	0°21.6′	0°38.88′	180.00	0.34	360.00	1.36	360.00	240.00	120.00
370	0°22.2′	0°41.07′	185.00	0.37	369.99	1.47	370.00	246.67	123.34
380	0°22.8′	0°43.32′	190.00	0.40	379.99	1.60	380.00	253.34	126.67
390	0°23.4′	0°45.63′	195.00	0.43	389.99	1.73	390.00	260.00	130.00
400	0°24.0′	0°48.00′	200.00	0.47	399.99	1.86	400.00	266.67	133.34
410	0°24.6′	0°50.43′	205.00	0.50	409.99	2.00	410.00	273.34	136.67
420	0°25.2′	0°52.92′	210.00	0.54	419.99	2.16	420.00	280.00	140.00
430	0°25.8′	0°55.47′	215.00	0.58	429.99	2.31	430.00	286.67	143.34
440	0°26.4′	0°58.08′	220.00	0.62	439.99	2.48	439.99	293.34	146.67
450	0°27.0′	1°00.75′	225.00	0.66	449.99	2.65	449.99	300.00	150.00
460	0°27.6′	1°03.48′	230.00	0.71	459.98	2.83	459.99	306.67	153.34
470	0°28.2′	1°06.27′	235.00	0.75	469.98	3.02	469.99	313.34	156.67
480	0°28.8′	1°09.12′	240.00	0.80	479.98	3.22	479.99	320.01	160.01
490	0°29.4′	1°12.03′	245.00	0.86	489.98	3.42	489.99	326.67	163.34
500	0°30.0′	1°15.00′	250.00	0.91	499.98	3.64	499.99	333.34	166.67

TABLE V, THE STANDARD HIGHWAY SPIRAL

a = 0.1—Continued

L	D	S	q	p	X	Y	C	U	V
510	0°30.6′	1°18.03′	255.00	0.96	509.97	3.86	509.99	340.01	170.01
520	0°31.2′	1°21.12′	260.00	1.02	519.97	4.09	519.99	346.68	173.34
530	0°31.8′	1°24.27′	264.99	1.08	529.97	4.33	529.99	353.34	176.68
540	0°32.4′	1°27.48′	269.99	1.15	539.97	4.58	539.98	360.01	180.01
550	0°33.0′	1°30.75′	274.99	1.21	549.96	4.84	549.98	366.68	183.35
560	0°33.6′	1°34.08′	279.99	1.28	559.96	5.11	559.98	373.35	186.68
570	0°34.2′	1°37.47′	284.99	1.35	569.95	5.39	569.98	380.02	190.01
580	0°34.8′	1°40.92′	289.99	1.42	579.95	5.68	579.98	386.68	193.35
590	0°35.4′	1°44.43′	294.99	1.49	589.95	5.97	589.98	393.35	196.68
600	0°36.0′	1°48.00′	299.99	1.57	599.94	6.28	599.97	400.02	200.02
610	0°36.6′	1°51.63′	304.99	1.65	609.94	6.60	609.97	406.69	203.35
620	0°37.2′	1°55.32′	309.99	1.73	619.93	6.93	619.97	413.36	206.69
630	0°37.8′	1°59.07′	314.99	1.82	629.92	7.27	629.97	420.03	210.02
640	0°38.4′	2°02.88′	319.99	1.91	639.92	7.62	639.96	426.70	213.36
650	0°39.0′	2°06.75′	324.99	2.00	649.91	7.99	649.96	433.36	216.69
660	0°39.6′	2°10.68′	329.98	2.09	659.90	8.36	659.96	440.03	220.03
670	0°40.2′	2°14.67′	334.98	2.19	669.90	8.75	669.95	446.70	223.37
680	0°40.8′	2°18.72′	339.98	2.29	679.89	9.15	679.95	453.37	226.70
690	0°41.4′	2°22.83′	344.98	2.39	689.88	9.55	689.95	460.04	230.04
700	0°42.0′	2°27.00′	349.98	2.49	699.87	9.98	699.94	466.71	233.37
710	0°42.6′	2°31.23′	354.98	2.60	709.86	10.41	709.94	473.38	236.71
720	0°43.2′	2°35.52′	359.98	2.71	719.85	10.86	719.93	480.05	240.05
730	0°43.8′	2°39.87′	364.97	2.83	729.84	11.31	729.93	486.72	243.38
740	0°44.4′	2°44.28′	369.97	2.95	739.83	11.79	739.92	493.39	246.72
750	0°45.0′	2°48.75′	374.97	3.07	749.82	12.27	749.92	500.06	250.06
760	0°45.6′	2°53.28′	379.97	3.19	759.81	12.77	759.91	506.73	253.39
770	0°46.2′	2°57.87′	384.97	3.32	769.79	13.28	769.91	513.41	256.73
780	0°46.8′	3°02.52′	389.96	3.45	779.78	13.80	779.90	520.08	260.07
790	0°47.4′	3°07.23′	394.96	3.59	789.77	14.34	789.90	526.75	263.41
800	0°48.0′	3°12.00′	399.96	3.72	799.75	14.89	799.89	533.42	266.75
810	0°48.6′	3°16.83′	404.96	3.86	809.73	15.46	809.88	540.09	270.08
820	0°49.2′	3°21.72′	409.95	4.01	819.72	16.03	819.87	546.77	273.42
830	0°49.8′	3°26.67′	414.95	4.16	829.70	16.63	829.87	553.44	276.76
840	0°50.4′	3°31.68′	419.95	4.31	839.68	17.24	839.86	560.11	280.10
850	0°51.0′	3°36.75′	424.94	4.47	849.66	17.86	849.85	566.78	283.44
860	0°51.6′	3°41.88′	429.94	4.62	859.64	18.50	859.84	573.46	286.78
870	0°52.2′	3°47.07′	434.94	4.79	869.62	19.15	869.83	580.13	290.12
880	0°52.8′	3°52.32′	439.93	4.95	879.60	19.82	879.82	586.81	293.46
890	0°53.4′	3°57.63′	444.93	5.13	889.57	20.50	889.81	593.48	296.80
900	0°54.0′	4°03.00′	449.93	5.30	899.55	21.20	899.80	600.16	300.14
910	0°54.6′	4°08.43′	454.92	5.48	909.52	21.91	909.79	606.83	303.48
920	0°55.2′	4°13.92′	459.92	5.66	919.50	22.64	919.78	613.51	306.83
930	0°55.8′	4°19.47′	464.91	5.85	929.47	23.39	929.76	620.19	310.17
940	0°56.4′	4°25.08′	469.91	6.04	939.44	24.15	939.75	626.86	313.51
950	0°57.0′	4°30.75′	474.90	6.23	949.41	24.93	949.74	633.54	316.85
960	0°57.6′	4°36.48′	479.90	6.43	959.38	25.72	959.72	640.22	320.20
970	0°58.2′	4°42.27′	484.89	6.64	969.35	26.54	969.71	646.90	323.54
980	0°58.8′	4°48.12′	489.89	6.84	979.31	27.36	979.69	653.57	326.89
990	0°59.4′	4°54.03′	494.88	7.05	989.28	28.21	989.68	660.25	330.23
1000	1°00.0′	5°00.00′	499.87	7.27	999.24	29.07	999.66	666.93	333.58

TABLE V, THE STANDARD HIGHWAY SPIRAL

$a = 0.2$

L	D	S	q	p	x	y	C	U	V
10	0°01.2′	0°00.06′	5.00	0.00	10.00	0.00	10.00	6.67	3.33
20	0°02.4′	0°00.24′	10.00	0.00	20.00	0.00	20.00	13.33	6.67
30	0°03.6′	0°00.54′	15.00	0.00	30.00	0.00	30.00	20.00	10.00
40	0°04.8′	0°00.96′	20.00	0.00	40.00	0.00	40.00	26.67	13.33
50	0°06.0′	0°01.50′	25.00	0.00	50.00	0.01	50.00	33.33	16.67
60	0°07.2′	0°02.16′	30.00	0.00	60.00	0.01	60.00	40.00	20.00
70	0°08.4′	0°02.94′	35.00	0.00	70.00	0.02	70.00	46.67	23.33
80	0°09.6′	0°03.84′	40.00	0.01	80.00	0.03	80.00	53.33	26.67
90	0°10.8′	0°04.86′	45.00	0.01	90.00	0.04	90.00	60.00	30.00
100	0°12.0′	0°06.00′	50.00	0.01	100.00	0.06	100.00	66.67	33.33
110	0°13.2′	0°07.26′	55.00	0.02	110.00	0.08	110.00	73.33	36.67
120	0°14.4′	0°08.64′	60.00	0.03	120.00	0.10	120.00	80.00	40.00
130	0°15.6′	0°10.14′	65.00	0.03	130.00	0.13	130.00	86.67	43.33
140	0°16.8′	0°11.76′	70.00	0.04	140.00	0.16	140.00	93.33	46.67
150	0°18.0′	0°13.50′	75.00	0.05	150.00	0.20	150.00	100.00	50.00
160	0°19.2′	0°15.36′	80.00	0.06	160.00	0.24	160.00	106.67	53.33
170	0°20.4′	0°17.34′	85.00	0.07	170.00	0.29	170.00	113.33	56.67
180	0°21.6′	0°19.44′	90.00	0.08	180.00	0.34	180.00	120.00	60.00
190	0°22.8′	0°21.66′	95.00	0.10	190.00	0.40	190.00	126.67	63.33
200	0°24.0′	0°24.00′	100.00	0.12	200.00	0.47	200.00	133.33	66.67
210	0°25.2′	0°26.46′	105.00	0.13	210.00	0.54	210.00	140.00	70.00
220	0°26.4′	0°29.04′	110.00	0.15	220.00	0.62	220.00	146.67	73.33
230	0°27.6′	0°31.74′	115.00	0.18	230.00	0.71	230.00	153.33	76.67
240	0°28.8′	0°34.56′	120.00	0.20	240.00	0.80	240.00	160.00	80.00
250	0°30.0′	0°37.50′	125.00	0.23	250.00	0.91	250.00	166.67	83.33
260	0°31.2′	0°40.56′	130.00	0.26	260.00	1.02	260.00	173.33	86.67
270	0°32.4′	0°43.74′	135.00	0.29	270.00	1.15	270.00	180.00	90.00
280	0°33.6′	0°47.04′	140.00	0.32	279.99	1.28	280.00	186.67	93.34
290	0°34.8′	0°50.46′	145.00	0.35	289.99	1.42	290.00	193.34	96.67
300	0°36.0′	0°54.00′	150.00	0.39	299.99	1.57	300.00	200.00	100.00
310	0°37.2′	0°57.66′	155.00	0.43	309.99	1.73	310.00	206.67	103.34
320	0°38.4′	1°01.44′	160.00	0.48	319.99	1.91	320.00	213.34	106.67
330	0°39.6′	1°05.34′	165.00	0.52	329.99	2.09	329.99	220.00	110.00
340	0°40.8′	1°09.36′	170.00	0.57	339.99	2.29	339.99	226.67	113.34
350	0°42.0′	1°13.50′	175.00	0.62	349.98	2.49	349.99	233.34	116.67
360	0°43.2′	1°17.76′	180.00	0.68	359.98	2.71	359.99	240.01	120.01
370	0°44.4′	1°22.14′	185.00	0.74	369.98	2.95	369.99	246.67	123.34
380	0°45.6′	1°26.64′	190.00	0.80	379.98	3.19	379.99	253.34	126.67
390	0°46.8′	1°31.26′	195.00	0.86	389.97	3.45	389.99	260.01	130.01
400	0°48.0′	1°36.00′	199.99	0.93	399.97	3.72	399.99	266.68	133.34
410	0°49.2′	1°40.86′	204.99	1.00	409.96	4.01	409.98	273.35	136.68
420	0°50.4′	1°45.84′	209.99	1.08	419.96	4.31	419.98	280.01	140.01
430	0°51.6′	1°50.94′	214.99	1.16	429.96	4.63	429.98	286.63	143.35
440	0°52.8′	1°56.16′	219.99	1.24	439.95	4.96	439.98	293.35	146.68
450	0°54.0′	2°01.50′	224.99	1.33	449.94	5.30	449.98	300.02	150.02
460	0°55.2′	2°06.96′	229.99	1.42	459.94	5.66	459.97	306.69	153.35
470	0°56.4′	2°12.54′	234.99	1.51	469.93	6.04	469.97	313.36	156.69
480	0°57.6′	2°18.24′	239.99	1.61	479.92	6.43	479.97	320.03	160.02
490	0°58.8′	2°24.06′	244.99	1.71	489.91	6.84	489.96	326.70	163.36
500	1°00.0′	2°30.00′	249.98	1.82	499.90	7.27	499.96	333.37	166.70

TABLE V, THE STANDARD HIGHWAY SPIRAL

a = 0.2—Continued

L	D	S	q	p	x	y	C	U	V
510	1°01.2′	2°36.06′	254.98	1.93	509.89	7.72	509.95	340.04	170.03
520	1°02.4′	2°42.24′	259.98	2.04	519.88	8.18	519.95	346.71	173.37
530	1°03.6′	2°48.54′	264.98	2.17	529.87	8.66	529.94	353.38	176.71
540	1°04.8′	2°54.90′	269.98	2.29	539.86	9.16	539.94	360.05	180.04
550	1°06.0′	3°01.50′	274.97	2.42	549.85	9.69	549.93	366.72	183.38
560	1°07.2′	3°08.16′	279.97	2.55	559.83	10.21	559.93	373.39	186.72
570	1°08.4′	3°14.94′	284.97	2.69	569.82	10.77	569.92	380.06	190.06
580	1°09.6′	3°21.84′	289.97	2.84	579.80	11.35	579.91	386.74	193.40
590	1°10.8′	3°28.86′	294.96	2.99	589.78	11.95	589.90	393.41	196.74
600	1°12.0′	3°36.00′	299.96	3.14	599.76	12.56	599.89	400.08	200.08
610	1°13.2′	3°43.26′	304.96	3.30	609.74	13.20	609.89	406.76	203.42
620	1°14.4′	3°50.64′	309.95	3.47	619.72	13.86	619.88	413.43	206.76
630	1°15.6′	3°58.14′	314.95	3.64	629.70	14.54	629.87	420.11	210.10
640	1°16.8′	4°05.76′	319.95	3.81	639.67	15.25	639.85	426.78	213.44
650	1°18.0′	4°13.50′	324.94	3.99	649.65	15.97	649.84	433.46	216.78
660	1°19.2′	4°21.36′	329.94	4.18	659.62	16.72	659.83	440.13	220.12
670	1°20.4′	4°29.34′	334.93	4.37	669.59	17.49	669.82	446.81	223.46
680	1°21.6′	4°37.44′	339.93	4.57	679.56	18.28	679.80	453.49	226.81
690	1°22.8′	4°45.66′	344.92	4.78	689.52	19.10	689.79	460.17	230.15
700	1°24.0′	4°54.00′	349.91	4.99	699.49	19.94	699.77	466.85	233.50
710	1°25.2′	5°02.46′	354.91	5.20	709.45	20.81	709.76	473.53	236.84
720	1°26.4′	5°11.04′	359.90	5.43	719.41	21.70	719.74	480.21	240.19
730	1°27.6′	5°19.74′	364.89	5.66	729.37	22.62	729.72	486.89	243.53
740	1°28.8′	5°28.56′	369.89	5.89	739.32	23.56	739.70	493.57	246.88
750	1°30.0′	5°37.50′	374.88	6.13	749.28	24.53	749.68	500.25	250.23
760	1°31.2′	5°46.56′	379.87	6.38	759.23	25.52	759.66	506.94	253.58
770	1°32.4′	5°55.74′	384.86	6.64	769.18	26.54	769.63	513.62	256.93
780	1°33.6′	6°05.04′	389.85	6.90	779.12	27.59	779.61	520.31	260.28
790	1°34.8′	6°14.46′	394.84	7.17	789.06	28.66	789.58	526.99	263.63
800	1°36.0′	6°24.00′	399.83	7.44	799.00	29.76	799.56	533.68	266.98
810	1°37.2′	6°33.66′	404.82	7.73	808.94	30.89	809.53	540.37	270.34
820	1°38.4′	6°43.44′	409.81	8.02	818.87	32.05	819.50	547.06	273.69
830	1°39.6′	6°53.34′	414.80	8.31	828.80	33.23	829.47	553.75	277.05
840	1°40.8′	7°03.36′	419.79	8.62	838.73	34.44	839.43	560.45	280.41
850	1°42.0′	7°13.50′	424.77	8.93	848.65	35.69	849.40	567.14	283.76
860	1°43.2′	7°23.76′	429.76	9.25	858.57	36.96	859.36	573.83	287.12
870	1°44.4′	7°34.14′	434.75	9.57	868.48	38.26	869.33	580.53	290.48
880	1°45.6′	7°44.64′	439.73	9.91	878.39	39.59	879.29	587.23	293.84
890	1°46.8′	7°55.26′	444.72	10.25	888.30	40.96	889.24	593.93	297.21
900	1°48.0′	8°06.00′	449.70	10.60	898.20	42.35	899.20	600.63	300.57
910	1°49.2′	8°16.86′	454.68	10.95	908.10	43.78	909.16	607.33	303.94
920	1°50.4′	8°27.84′	459.67	11.32	917.99	45.23	919.11	614.04	307.31
930	1°51.6′	8°38.94′	464.65	11.69	927.88	46.72	929.06	620.74	310.67
940	1°52.8′	8°50.16′	469.63	12.07	937.77	48.24	939.01	627.45	314.04
950	1°54.0′	9°01.50′	474.61	12.46	947.65	49.79	948.95	634.16	317.42
960	1°55.2′	9°12.96′	479.59	12.86	957.52	51.38	958.90	640.87	320.79
970	1°56.4′	9°24.54′	484.56	13.26	967.39	52.99	968.84	647.58	324.17
980	1°57.6′	9°36.24′	489.54	13.68	977.25	54.65	978.78	654.30	327.54
990	1°58.8′	9°48.06′	494.52	14.10	987.11	56.33	988.71	661.01	330.92
1000	2°00.0′	10°00.00′	499.49	14.53	996.96	58.05	998.65	667.73	334.30

TABLE V, THE STANDARD HIGHWAY SPIRAL

a = 0.25

L	D	S	q	p	x	y	C	U	V
10	0°01.5′	0°00.08′	5.00	0.00	10.00	0.00	10.00	6.67	3.33
20	0°03.0′	0°00.30′	10.00	0.00	20.00	0.00	20.00	13.33	6.67
30	0°04.5′	0°00.68′	15.00	0.00	30.00	0.00	30.00	20.00	10.00
40	0°06.0′	0°01.20′	20.00	0.00	40.00	0.00	40.00	26.67	13.33
50	0°07.5′	0°01.88′	25.00	0.00	50.00	0.01	50.00	33.33	16.67
60	0°09.0′	0°02.70′	30.00	0.00	60.00	0.02	60.00	40.00	20.00
70	0°10.5′	0°03.68′	35.00	0.01	70.00	0.02	70.00	46.67	23.33
80	0°12.0′	0°04.80′	40.00	0.01	80.00	0.04	80.00	53.33	26.67
90	0°13.5′	0°06.08′	45.00	0.01	90.00	0.05	90.00	60.00	30.00
100	0°15.0′	0°07.50′	50.00	0.02	100.00	0.07	100.00	66.67	33.33
110	0°16.5′	0°09.08′	55.00	0.02	110.00	0.10	110.00	73.33	36.67
120	0°18.0′	0°10.80′	60.00	0.03	120.00	0.13	120.00	80.00	40.00
130	0°19.5′	0°12.68′	65.00	0.04	130.00	0.16	130.00	86.67	43.33
140	0°21.0′	0°14.70′	70.00	0.05	140.00	0.20	140.00	93.33	46.67
150	0°22.5′	0°16.88′	75.00	0.06	150.00	0.25	150.00	100.00	50.00
160	0°24.0′	0°19.20′	80.00	0.07	160.00	0.30	160.00	106.67	53.33
170	0°25.5′	0°21.68′	85.00	0.09	170.00	0.36	170.00	113.33	56.67
180	0°27.0′	0°24.30′	90.00	0.11	180.00	0.42	180.00	120.00	60.00
190	0°28.5′	0°27.08′	95.00	0.12	190.00	0.50	190.00	126.67	63.33
200	0°30.0′	0°30.00′	100.00	0.15	200.00	0.58	200.00	133.33	66.67
210	0°31.5′	0°33.08′	105.00	0.17	210.00	0.67	210.00	140.00	70.00
220	0°33.0′	0°36.30′	110.00	0.19	220.00	0.77	220.00	146.67	73.33
230	0°34.5′	0°39.68′	115.00	0.22	230.00	0.88	230.00	153.33	76.67
240	0°36.0′	0°43.20′	120.00	0.25	240.00	1.01	240.00	160.00	80.00
250	0°37.5′	0°46.88′	125.00	0.28	250.00	1.14	250.00	166.67	83.33
260	0°39.0′	0°50.70′	130.00	0.32	259.99	1.28	260.00	173.34	86.67
270	0°40.5′	0°54.68′	135.00	0.36	269.99	1.43	270.00	180.00	90.00
280	0°42.0′	0°58.80′	140.00	0.40	279.99	1.60	280.00	186.67	93.34
290	0°43.5′	1°03.08′	145.00	0.44	289.99	1.77	290.00	193.34	96.67
300	0°45.0′	1°07.50′	150.00	0.49	299.99	1.96	299.99	200.00	100.00
310	0°46.5′	1°12.08′	155.00	0.54	309.99	2.17	309.99	206.67	103.34
320	0°48.0′	1°16.80′	160.00	0.60	319.98	2.38	319.99	213.34	106.67
330	0°49.5′	1°21.68′	165.00	0.65	329.98	2.61	329.99	220.01	110.01
340	0°51.0′	1°26.70′	170.00	0.71	339.98	2.86	339.99	226.67	113.34
350	0°52.5′	1°31.88′	175.00	0.78	349.97	3.12	349.99	233.34	116.67
360	0°54.0′	1°37.20′	180.00	0.85	359.97	3.39	359.99	240.01	120.01
370	0°55.5′	1°42.68′	184.99	0.92	369.97	3.68	369.99	246.68	123.34
380	0°57.0′	1°48.30′	189.99	1.00	379.96	3.99	379.98	253.35	126.68
390	0°58.5′	1°54.08′	194.99	1.08	389.96	4.31	389.98	260.01	130.01
400	1°00.0′	2°00.00′	199.99	1.16	399.95	4.65	399.98	266.68	133.35
410	1°01.5′	2°06.08′	204.99	1.25	409.94	5.01	409.98	273.35	136.68
420	1°03.0′	2°12.30′	209.99	1.35	419.94	5.39	419.97	280.02	140.02
430	1°04.5′	2°18.68′	214.99	1.45	429.93	5.78	429.97	286.69	143.36
440	1°06.0′	2°25.20′	219.99	1.55	439.92	6.19	439.97	293.36	146.69
450	1°07.5′	2°31.88′	224.99	1.66	449.91	6.63	449.96	300.03	150.03
460	1°09.0′	2°38.70′	229.98	1.77	459.90	7.08	459.96	306.70	153.36
470	1°10.5′	2°45.68′	234.98	1.89	469.89	7.55	469.95	313.37	156.70
480	1°12.0′	2°52.80′	239.98	2.01	479.88	8.04	479.95	320.04	160.04
490	1°13.5′	3°00.08′	244.98	2.14	489.87	8.55	489.94	326.71	163.38
500	1°15.0′	3°07.50′	249.98	2.27	499.85	9.09	499.93	333.39	166.71

TABLE V, THE STANDARD HIGHWAY SPIRAL

a = 0.25—Continued

L	D	S	q	p	X	Y	C	U	V
510	1°16.5′	3°15.08′	254.97	2.41	509.84	9.64	509.93	340.06	170.05
520	1°18.0′	3°22.80′	259.97	2.56	519.82	10.22	519.92	346.73	173.39
530	1°19.5′	3°30.68′	264.97	2.71	529.80	10.82	529.91	353.40	176.73
540	1°21.0′	3°38.70′	269.96	2.86	539.78	11.45	539.90	360.08	180.07
550	1°22.5′	3°46.88′	274.96	3.02	549.76	12.10	549.89	366.75	183.41
560	1°24.0′	3°55.20′	279.96	3.19	559.74	12.77	559.88	373.42	186.75
570	1°25.5′	4°03.68′	284.95	3.37	569.71	13.46	569.87	380.10	190.09
580	1°27.0′	4°12.30′	289.95	3.55	579.69	14.18	579.86	386.78	193.43
590	1°28.5′	4°21.08′	294.94	3.73	589.66	14.93	589.85	393.45	196.77
600	1°30.0′	4°30.00′	299.94	3.93	599.63	15.70	599.84	400.13	200.12
610	1°31.5′	4°39.08′	304.93	4.13	609.60	16.50	609.82	406.81	203.46
620	1°33.0′	4°48.30′	309.93	4.33	619.56	17.32	619.81	413.49	206.81
630	1°34.5′	4°57.68′	314.92	4.54	629.53	18.17	629.79	420.17	210.15
640	1°36.0′	5°07.20′	319.91	4.76	639.49	19.05	639.77	426.85	213.50
650	1°37.5′	5°16.88′	324.91	4.99	649.45	19.96	649.75	433.53	216.84
660	1°39.0′	5°26.70′	329.90	5.23	659.40	20.89	659.74	440.21	220.19
670	1°40.5′	5°36.68′	334.89	5.47	669.36	21.86	669.71	446.89	223.54
680	1°42.0′	5°46.80′	339.88	5.71	679.31	22.85	679.69	453.58	226.89
690	1°43.5′	5°57.08′	344.88	5.97	689.26	23.87	689.67	460.26	230.24
700	1°45.0′	6°07.50′	349.87	6.23	699.20	24.92	699.64	466.95	233.59
710	1°46.5′	6°18.08′	354.86	6.50	709.14	26.01	709.62	473.63	236.94
720	1°48.0′	6°28.80′	359.85	6.78	719.08	27.12	719.59	480.32	240.29
730	1°49.5′	6°39.68′	364.84	7.07	729.01	28.26	729.56	487.01	243.65
740	1°51.0′	6°50.70′	369.82	7.36	738.94	29.44	739.53	493.70	247.00
750	1°52.5′	7°01.88′	374.81	7.67	748.87	30.65	749.50	500.39	250.36
760	1°54.0′	7°13.20′	379.80	7.98	758.79	31.89	759.46	507.09	253.72
770	1°55.5′	7°24.68′	384.79	8.30	768.71	33.16	769.43	513.78	257.08
780	1°57.0′	7°36.30′	389.77	8.62	778.63	34.47	779.39	520.48	260.44
790	1°58.5′	7°48.08′	394.76	8.96	788.54	35.81	789.35	527.18	263.80
800	2°00.0′	8°00.00′	399.74	9.30	798.44	37.18	799.31	533.88	267.16
810	2°01.5′	8°12.08′	404.72	9.65	808.34	38.59	809.26	540.58	270.53
820	2°03.0′	8°24.30′	409.71	10.02	818.24	40.04	819.22	547.28	273.89
830	2°04.5′	8°36.68′	414.69	10.39	828.13	41.51	829.17	553.99	277.26
840	2°06.0′	8°49.20′	419.67	10.77	838.01	43.03	839.12	560.70	280.63
850	2°07.5′	9°01.88′	424.65	11.16	847.89	44.58	849.06	567.41	284.01
860	2°09.0′	9°14.70′	429.63	11.55	857.76	46.17	859.01	574.12	287.38
870	2°10.5′	9°27.68′	434.60	11.96	867.63	47.79	868.95	580.83	290.76
880	2°12.0′	9°40.80′	439.58	12.38	877.49	49.46	878.88	587.55	294.13
890	2°13.5′	9°54.08′	444.56	12.80	887.35	51.16	888.82	594.26	297.51
900	2°15.0′	10°07.50′	449.53	13.24	897.19	52.90	898.75	600.98	300.90
910	2°16.5′	10°21.08′	454.51	13.68	907.03	54.67	908.68	607.71	304.28
920	2°18.0′	10°34.80′	459.48	14.14	916.87	56.49	918.61	614.43	307.67
930	2°19.5′	10°48.68′	464.45	14.61	926.69	58.35	928.53	621.16	311.06
940	2°21.0′	11°02.70′	469.42	15.08	936.51	60.24	938.45	627.89	314.45
950	2°22.5′	11°16.88′	474.39	15.57	946.32	62.18	948.36	634.62	317.84
960	2°24.0′	11°31.20′	479.35	16.06	956.13	64.15	958.28	641.36	321.24
970	2°25.5′	11°45.68′	484.32	16.57	965.92	66.17	968.18	648.10	324.64
980	2°27.0′	12°00.30′	489.28	17.08	975.71	68.23	978.09	654.84	328.04
990	2°28.5′	12°15.08′	494.25	17.61	985.48	70.33	987.99	661.59	331.44
1000	2°30.0′	12°30.00′	499.21	18.15	995.25	72.48	997.89	668.34	334.85

TABLE V, THE STANDARD HIGHWAY SPIRAL

$a = 0.3$

L	D	S	q	p	x	y	C	U	V
10	0°01.8′	0°00.09′	5.00	0.00	10.00	0.00	10.00	6.67	3.33
20	0°03.6′	0°00.36′	10.00	0.00	20.00	0.00	20.00	13.33	6.67
30	0°05.4′	0°00.81′	15.00	0.00	30.00	0.00	30.00	20.00	10.00
40	0°07.2′	0°01.44′	20.00	0.00	40.00	0.01	40.00	26.67	13.33
50	0°09.0′	0°02.25′	25.00	0.00	50.00	0.01	50.00	33.33	16.67
60	0°10.8′	0°03.24′	30.00	0.00	60.00	0.02	60.00	40.00	20.00
70	0°12.6′	0°04.41′	35.00	0.01	70.00	0.03	70.00	46.67	23.33
80	0°14.4′	0°05.76′	40.00	0.01	80.00	0.04	80.00	53.33	26.67
90	0°16.2′	0°07.29′	45.00	0.02	90.00	0.06	90.00	60.00	30.00
100	0°18.0′	0°09.00′	50.00	0.02	100.00	0.09	100.00	66.67	33.33
110	0°19.8′	0°10.89′	55.00	0.03	110.00	0.12	110.00	73.33	36.67
120	0°21.6′	0°12.96′	60.00	0.04	120.00	0.15	120.00	80.00	40.00
130	0°23.4′	0°15.21′	65.00	0.05	130.00	0.19	130.00	86.67	43.33
140	0°25.2′	0°17.64′	70.00	0.06	140.00	0.24	140.00	93.33	46.67
150	0°27.0′	0°20.25′	75.00	0.07	150.00	0.29	150.00	100.00	50.00
160	0°28.8′	0°23.04′	80.00	0.09	160.00	0.36	160.00	106.67	53.33
170	0°30.6′	0°26.01′	85.00	0.11	170.00	0.43	170.00	113.33	56.67
180	0°32.4′	0°29.16′	90.00	0.13	180.00	0.51	180.00	120.00	60.00
190	0°34.2′	0°32.49′	95.00	0.15	190.00	0.60	190.00	126.67	63.33
200	0°36.0′	0°36.00′	100.00	0.17	200.00	0.70	200.00	133.33	66.67
210	0°37.8′	0°39.69′	105.00	0.20	210.00	0.81	210.00	140.00	70.00
220	0°39.6′	0°43.56′	110.00	0.23	220.00	0.93	220.00	146.67	73.33
230	0°41.4′	0°47.61′	115.00	0.27	230.00	1.06	230.00	153.33	76.67
240	0°43.2′	0°51.84′	120.00	0.30	239.99	1.21	240.00	160.00	80.00
250	0°45.0′	0°56.25′	125.00	0.34	249.99	1.36	250.00	166.67	83.34
260	0°46.8′	1°00.84′	130.00	0.38	259.99	1.53	260.00	173.34	86.67
270	0°48.6′	1°05.61′	135.00	0.43	269.99	1.72	270.00	180.00	90.00
280	0°50.4′	1°10.56′	140.00	0.48	279.99	1.92	279.99	186.67	93.34
290	0°52.2′	1°15.69′	145.00	0.53	289.99	2.13	289.99	193.34	96.67
300	0°54.0′	1°21.00′	150.00	0.59	299.98	2.36	299.99	200.01	100.01
310	0°55.8′	1°26.49′	155.00	0.65	309.98	2.60	309.99	206.67	103.34
320	0°57.6′	1°32.16′	160.00	0.71	319.98	2.86	319.99	213.34	106.67
330	0°59.4′	1°38.01′	165.00	0.78	329.97	3.14	329.99	220.01	110.01
340	1°01.2′	1°44.04′	169.99	0.86	339.97	3.43	339.99	226.68	113.34
350	1°03.0′	1°50.25′	174.99	0.94	349.96	3.74	349.98	233.35	116.68
360	1°04.8′	1°56.64′	179.99	1.02	359.96	4.07	359.98	240.01	120.01
370	1°06.6′	2°03.21′	184.99	1.11	369.95	4.42	369.98	246.68	123.35
380	1°08.4′	2°09.96′	189.99	1.20	379.95	4.79	379.98	253.35	126.68
390	1°10.2′	2°16.89′	194.99	1.29	389.94	5.18	389.97	260.02	130.02
400	1°12.0′	2°24.00′	199.99	1.40	399.93	5.58	399.97	266.69	133.36
410	1°13.8′	2°31.29′	204.99	1.50	409.92	6.01	409.96	273.36	136.69
420	1°15.6′	2°38.76′	209.99	1.62	419.91	6.46	419.96	280.03	140.03
430	1°17.4′	2°46.41′	214.98	1.73	429.90	6.94	429.96	286.70	143.37
440	1°19.2′	2°54.24′	219.98	1.86	439.89	7.43	439.95	293.37	146.70
450	1°21.0′	3°02.25′	224.98	1.99	449.87	7.95	449.94	300.04	150.04
460	1°22.8′	3°10.44′	229.98	2.12	459.86	8.49	459.94	306.72	153.38
470	1°24.6′	3°18.81′	234.97	2.26	469.84	9.06	469.93	313.39	156.72
480	1°26.4′	3°27.36′	239.97	2.41	479.83	9.65	479.92	320.06	160.06
490	1°28.2′	3°36.09′	244.97	2.57	489.81	10.26	489.91	326.73	163.39
500	1°30.0′	3°45.00′	249.96	2.73	499.79	10.90	499.90	333.41	166.73

TABLE V, THE STANDARD HIGHWAY SPIRAL

a = 0.3—Continued

L	D	S	q	p	x	y	C	U	V
510	1°31.8′	3°54.09′	254.96	2.89	509.76	11.57	509.89	340.08	170.08
520	1°33.6′	4°03.36′	259.96	3.07	519.74	12.27	519.88	346.76	173.42
530	1°35.4′	4°12.81′	264.95	3.25	529.71	12.99	529.87	353.43	176.76
540	1°37.2′	4°22.44′	269.95	3.43	539.69	13.74	539.86	360.11	180.10
550	1°39.0′	4°32.25′	274.94	3.63	549.66	14.51	549.85	366.79	183.44
560	1°40.8′	4°42.24′	279.94	3.83	559.62	15.32	559.83	373.47	186.79
570	1°42.6′	4°52.41′	284.93	4.04	569.59	16.15	569.82	380.14	190.13
580	1°44.4′	5°02.76′	289.93	4.26	579.55	17.02	579.80	386.82	193.48
590	1°46.2′	5°13.29′	294.92	4.48	589.51	17.91	589.78	393.50	196.82
600	1°48.0′	5°24.00′	299.91	4.71	599.47	18.84	599.76	400.19	200.17
610	1°49.8′	5°34.89′	304.90	4.95	609.42	19.79	609.74	406.87	203.52
620	1°51.6′	5°45.96′	309.90	5.20	619.37	20.78	619.72	413.55	206.87
630	1°53.4′	5°57.21′	314.89	5.45	629.32	21.80	629.70	420.24	210.22
640	1°55.2′	6°08.64′	319.88	5.72	639.26	22.86	639.67	426.92	213.57
650	1°57.0′	6°20.25′	324.87	5.99	649.21	23.94	649.65	433.61	216.92
660	1°58.8′	6°32.04′	329.86	6.27	659.14	25.07	659.62	440.30	220.27
670	2°00.6′	6°44.01′	334.85	6.56	669.08	26.22	669.59	446.99	223.63
680	2°02.4′	6°56.16′	339.83	6.86	679.00	27.41	679.56	453.68	226.98
690	2°04.2′	7°08.49′	344.82	7.16	688.93	28.64	689.52	460.37	230.34
700	2°06.0′	7°21.00′	349.81	7.48	698.85	29.90	699.49	467.07	233.70
710	2°07.8′	7°33.69′	354.79	7.80	708.76	31.19	709.45	473.77	237.06
720	2°09.6′	7°46.56′	359.78	8.14	718.67	32.53	719.41	480.46	240.42
730	2°11.4′	7°59.61′	364.76	8.48	728.58	33.90	729.37	487.16	243.79
740	2°13.2′	8°12.84′	369.75	8.83	738.48	35.31	739.32	493.87	247.15
750	2°15.0′	8°26.25′	374.73	9.20	748.38	36.76	749.28	500.57	250.52
760	2°16.8′	8°39.84′	379.71	9.57	758.26	38.25	759.23	507.27	253.89
770	2°18.6′	8°53.61′	384.69	9.95	768.15	39.77	769.18	513.98	257.26
780	2°20.4′	9°07.56′	389.67	10.34	778.02	41.34	779.12	520.69	260.63
790	2°22.2′	9°21.69′	394.65	10.75	787.89	42.94	789.06	527.41	264.00
800	2°24.0′	9°36.00′	399.63	11.16	797.76	44.59	799.00	534.12	267.38
810	2°25.8′	9°50.49′	404.60	11.58	807.61	46.28	808.94	540.84	270.76
820	2°27.6′	10°05.16′	409.58	12.02	817.46	48.01	818.87	547.56	274.14
830	2°29.4′	10°20.01′	414.55	12.46	827.30	49.78	828.80	554.28	277.53
840	2°31.2′	10°35.04′	419.52	12.92	837.14	51.60	838.73	561.00	280.91
850	2°33.0′	10°50.25′	424.49	13.38	846.96	53.46	848.65	567.73	284.30
860	2°34.8′	11°05.64′	429.46	13.86	856.78	55.36	858.57	574.46	287.69
870	2°36.6′	11°21.21′	434.43	14.35	866.59	57.30	868.48	581.20	291.09
880	2°38.4′	11°36.96′	439.40	14.85	876.39	59.30	878.39	587.93	294.49
890	2°40.2′	11°52.89′	444.36	15.36	886.18	61.33	888.30	594.68	297.89
900	2°42.0′	12°09.00′	449.33	15.88	895.96	63.41	898.20	601.42	301.29
910	2°43.8′	12°25.29′	454.29	16.41	905.73	65.54	908.10	608.17	304.70
920	2°45.6′	12°41.76′	459.25	16.96	915.49	67.72	917.99	614.92	308.11
930	2°47.4′	12°58.41′	464.21	17.52	925.24	69.94	927.88	621.67	311.52
940	2°49.2′	13°15.24′	469.16	18.09	934.98	72.21	937.77	628.43	314.94
950	2°51.0′	13°32.25′	474.12	18.67	944.71	74.52	947.64	635.20	318.36
960	2°52.8′	13°49.44′	479.07	19.26	954.43	76.89	957.52	641.96	321.78
970	2°54.6′	14°06.81′	484.02	19.87	964.13	79.30	967.39	648.73	325.21
980	2°56.4′	14°24.36′	488.97	20.49	973.82	81.76	977.25	655.51	328.65
990	2°58.2′	14°42.09′	493.92	21.12	983.50	84.28	987.11	662.29	332.08
1000	3°00.0′	15°00.00′	498.86	21.76	993.17	86.84	996.96	669.08	335.52

TABLE V, THE STANDARD HIGHWAY SPIRAL

$a = 0.4$

L	D	S	q	p	X	Y	C	U	V
10	0°02.4′	0°00.12′	5.00	0.00	10.00	0.00	10.00	6.67	3.33
20	0°04.8′	0°00.48′	10.00	0.00	20.00	0.00	20.00	13.33	6.67
30	0°07.2′	0°01.08′	15.00	0.00	30.00	0.00	30.00	20.00	10.00
40	0°09.6′	0°01.92′	20.00	0.00	40.00	0.01	40.00	26.67	13.33
50	0°12.0′	0°03.00′	25.00	0.00	50.00	0.01	50.00	33.33	16.67
60	0°14.4′	0°04.32′	30.00	0.01	60.00	0.03	60.00	40.00	20.00
70	0°16.8′	0°05.88′	35.00	0.01	70.00	0.04	70.00	46.67	23.33
80	0°19.2′	0°07.68′	40.00	0.01	80.00	0.06	80.00	53.33	26.67
90	0°21.6′	0°09.72′	45.00	0.02	90.00	0.08	90.00	60.00	30.00
100	0°24.0′	0°12.00′	50.00	0.03	100.00	0.12	100.00	66.67	33.33
110	0°26.4′	0°14.52′	55.00	0.04	110.00	0.15	110.00	73.33	36.67
120	0°28.8′	0°17.28′	60.00	0.05	120.00	0.20	120.00	80.00	40.00
130	0°31.2′	0°20.28′	65.00	0.06	130.00	0.26	130.00	86.67	43.33
140	0°33.6′	0°23.52′	70.00	0.08	140.00	0.32	140.00	93.33	46.67
150	0°36.0′	0°27.00′	75.00	0.10	150.00	0.39	150.00	100.00	50.00
160	0°38.4′	0°30.72′	80.00	0.12	160.00	0.48	160.00	106.67	53.33
170	0°40.8′	0°34.68′	85.00	0.14	170.00	0.57	170.00	113.33	56.67
180	0°43.2′	0°38.88′	90.00	0.17	180.00	0.68	180.00	120.00	60.00
190	0°45.6′	0°43.32′	95.00	0.20	190.00	0.80	190.00	126.67	63.33
200	0°48.0′	0°48.00′	100.00	0.23	200.00	0.93	200.00	133.33	66.67
210	0°50.4′	0°52.92′	105.00	0.27	210.00	1.08	210.00	140.00	70.00
220	0°52.8′	0°58.08′	110.00	0.31	219.99	1.24	220.00	146.67	73.34
230	0°55.2′	1°03.48′	115.00	0.35	229.99	1.42	230.00	153.34	76.67
240	0°57.6′	1°09.12′	120.00	0.40	239.99	1.61	240.00	160.00	80.00
250	1°00.0′	1°15.00′	125.00	0.45	249.99	1.82	249.99	166.67	83.34
260	1°02.4′	1°21.12′	130.00	0.51	259.99	2.04	259.99	173.34	86.67
270	1°04.8′	1°27.48′	135.00	0.57	269.98	2.29	269.99	180.01	90.01
280	1°07.2′	1°34.08′	140.00	0.64	279.98	2.55	279.99	186.67	93.34
290	1°09.6′	1°40.92′	145.00	0.71	289.98	2.84	289.99	193.34	96.67
300	1°12.0′	1°48.00′	150.00	0.79	299.97	3.14	299.99	200.01	100.01
310	1°14.4′	1°55.32′	154.99	0.87	309.97	3.47	309.98	206.68	103.34
320	1°16.8′	2°02.88′	159.99	0.95	319.96	3.81	319.98	213.35	106.68
330	1°19.2′	2°10.68′	164.99	1.05	329.95	4.18	329.98	220.02	110.02
340	1°21.6′	2°18.72′	169.99	1.14	339.94	4.57	339.98	226.69	113.35
350	1°24.0′	2°27.00′	174.99	1.25	349.94	4.99	349.97	233.36	116.69
360	1°26.4′	2°35.52′	179.99	1.36	359.93	5.43	359.97	240.03	120.02
370	1°28.8′	2°44.28′	184.99	1.47	369.92	5.89	369.96	246.70	123.36
380	1°31.2′	2°53.28′	189.98	1.60	379.90	6.38	379.96	253.37	126.70
390	1°33.6′	3°02.52′	194.98	1.73	389.89	6.90	389.95	260.04	130.03
400	1°36.0′	3°12.00′	199.98	1.86	399.88	7.45	399.94	266.71	133.37
410	1°38.4′	3°21.72′	204.98	2.00	409.86	8.02	409.94	273.38	136.71
420	1°40.8′	3°31.68′	209.97	2.15	419.84	8.62	419.93	280.06	140.05
430	1°43.2′	3°41.88′	214.97	2.31	429.82	9.25	429.92	286.73	143.39
440	1°45.6′	3°52.32′	219.97	2.48	439.80	9.91	439.91	293.40	146.73
450	1°48.0′	4°03.00′	224.96	2.65	449.78	10.60	449.90	300.08	150.07
460	1°50.4′	4°13.92′	229.96	2.83	459.75	11.32	459.89	306.75	153.41
470	1°52.8′	4°25.08′	234.95	3.02	469.72	12.08	469.88	313.43	156.76
480	1°55.2′	4°36.48′	239.95	3.22	479.69	12.86	479.86	320.11	160.10
490	1°57.6′	4°48.12′	244.94	3.42	489.66	13.68	489.85	326.79	163.44
500	2°00.0′	5°00.00′	249.94	3.64	499.62	14.54	499.83	333.47	166.79

TABLE V, THE STANDARD HIGHWAY SPIRAL

a = 0.4—Continued

L	D	S	q	p	x	y	C	U	V
510	2°02.4′	5°12.12′	254.93	3.86	509.58	15.43	509.81	340.15	170.13
520	2°04.8′	5°24.48′	259.92	4.09	519.54	16.35	519.79	346.83	173.48
530	2°07.2′	5°37.08′	264.92	4.33	529.49	17.31	529.77	353.51	176.83
540	2°09.6′	5°49.92′	269.91	4.58	539.44	18.31	539.75	360.20	180.18
550	2°12.0′	6°03.00′	274.90	4.84	549.39	19.34	549.73	366.88	183.53
560	2°14.4′	6°16.32′	279.89	5.11	559.33	20.42	559.70	373.57	186.88
570	2°16.8′	6°29.88′	284.88	5.38	569.27	21.53	569.67	380.26	190.23
580	2°19.2′	6°43.68′	289.87	5.67	579.20	22.68	579.64	386.95	193.59
590	2°21.6′	6°57.72′	294.85	5.97	589.13	23.87	589.61	393.64	196.94
600	2°24.0′	7°12.00′	299.84	6.28	599.05	25.10	599.58	400.33	200.30
610	2°26.4′	7°26.52′	304.83	6.60	608.97	26.38	609.54	407.03	203.66
620	2°28.8′	7°41.28′	309.81	6.93	618.88	27.70	619.50	413.72	207.02
630	2°31.2′	7°56.28′	314.80	7.27	628.79	29.05	629.46	420.42	210.38
640	2°33.6′	8°11.52′	319.78	7.62	638.69	30.46	639.42	427.12	213.75
650	2°36.0′	8°27.00′	324.76	7.98	648.59	31.90	649.37	433.83	217.12
660	2°38.4′	8°42.72′	329.75	8.36	658.48	33.40	659.32	440.53	220.49
670	2°40.8′	8°58.68′	334.73	8.74	668.36	34.93	669.27	447.24	223.86
680	2°43.2′	9°14.88′	339.70	9.14	678.23	36.52	679.21	453.95	227.23
690	2°45.6′	9°31.32′	344.68	9.55	688.10	38.15	689.15	460.67	230.61
700	2°48.0′	9°48.00′	349.66	9.97	697.95	39.83	699.09	467.38	233.99
710	2°50.4′	10°04.92′	354.63	10.40	707.80	41.55	709.02	474.10	237.37
720	2°52.8′	10°22.08′	359.61	10.84	717.65	43.33	718.95	480.83	240.75
730	2°55.2′	10°39.48′	364.58	11.30	727.48	45.15	728.88	487.55	244.14
740	2°57.6′	10°57.12′	369.55	11.77	737.30	47.03	738.80	494.28	247.53
750	3°00.0′	11°15.00′	374.52	12.25	747.11	48.95	748.72	501.01	250.92
760	3°02.4′	11°33.12′	379.49	12.75	756.92	50.93	758.63	507.75	254.32
770	3°04.8′	11°51.48′	384.45	13.26	766.71	52.96	768.54	514.49	257.72
780	3°07.2′	12°10.08′	389.41	13.78	776.49	55.04	778.44	521.23	261.12
790	3°09.6′	12°28.92′	394.38	14.32	786.26	57.17	788.33	527.98	264.53
800	3°12.0′	12°48.00′	399.34	14.87	796.02	59.36	798.23	534.73	267.94
810	3°14.4′	13°07.32′	404.29	15.43	805.76	61.60	808.11	541.49	271.36
820	3°16.8′	13°26.88′	409.25	16.01	815.49	63.90	817.99	548.25	274.78
830	3°19.2′	13°46.68′	414.20	16.60	825.21	66.26	827.87	555.02	278.20
840	3°21.6′	14°06.72′	419.15	17.20	834.92	68.67	837.74	561.79	281.63
850	3°24.0′	14°27.00′	424.10	17.82	844.61	71.13	847.60	568.57	285.06
860	3°26.4′	14°47.52′	429.05	18.46	854.29	73.66	857.46	575.35	288.50
870	3°28.8′	15°08.28′	433.99	19.11	863.95	76.24	867.30	582.14	291.94
880	3°31.2′	15°29.28′	438.93	19.77	873.59	78.88	877.15	588.93	295.39
890	3°33.6′	15°50.52′	443.87	20.45	883.22	81.58	886.98	595.73	298.84
900	3°36.0′	16°12.00′	448.80	21.15	892.83	84.34	896.81	602.53	302.30
910	3°38.4′	16°33.72′	453.74	21.86	902.43	87.16	906.63	609.34	305.77
920	3°40.8′	16°55.68′	458.66	22.58	912.00	90.04	916.44	616.16	309.24
930	3°43.2′	17°17.88′	463.59	23.32	921.56	92.98	926.24	622.99	312.72
940	3°45.6′	17°40.32′	468.51	24.08	931.10	95.99	936.03	629.82	316.20
950	3°48.0′	18°03.00′	473.43	24.85	940.61	99.06	945.82	636.66	319.69
960	3°50.4′	18°25.92′	478.35	25.64	950.11	102.19	955.59	643.50	323.19
970	3°52.8′	18°49.08′	483.26	26.45	959.59	105.38	965.36	650.36	326.69
980	3°55.2′	19°12.48′	488.17	27.27	969.04	108.64	975.11	657.22	330.20
990	3°57.6′	19°36.12′	493.08	28.11	978.48	111.96	984.86	664.09	333.72
1000	4°00.0′	20°00.00′	497.98	28.96	987.88	115.35	994.60	670.97	337.25

TABLE V, THE STANDARD HIGHWAY SPIRAL

a = 0.5

L	D	S	q	p	X	Y	C	U	V
10	0°03.0′	0°00.15′	5.00	0.00	10.00	0.00	10.00	6.67	3.33
20	0°06.0′	0°00.60′	10.00	0.00	20.00	0.00	20.00	13.33	6.67
30	0°09.0′	0°01.35′	15.00	0.00	30.00	0.00	30.00	20.00	10.00
40	0°12.0′	0°02.40′	20.00	0.00	40.00	0.01	40.00	26.67	13.33
50	0°15.0′	0°03.75′	25.00	0.00	50.00	0.02	50.00	33.33	16.67
60	0°18.0′	0°05.40′	30.00	0.01	60.00	0.03	60.00	40.00	20.00
70	0°21.0′	0°07.35′	35.00	0.01	70.00	0.05	70.00	46.67	23.33
80	0°24.0′	0°09.60′	40.00	0.02	80.00	0.07	80.00	53.33	26.67
90	0°27.0′	0°12.15′	45.00	0.03	90.00	0.11	90.00	60.00	30.00
100	0°30.0′	0°15.00′	50.00	0.04	100.00	0.15	100.00	66.67	33.33
110	0°33.0′	0°18.15′	55.00	0.05	110.00	0.19	110.00	73.33	36.67
120	0°36.0′	0°21.60′	60.00	0.06	120.00	0.25	120.00	80.00	40.00
130	0°39.0′	0°25.35′	65.00	0.08	130.00	0.32	130.00	86.67	43.33
140	0°42.0′	0°29.40′	70.00	0.10	140.00	0.40	140.00	93.33	46.67
150	0°45.0′	0°33.75′	75.00	0.12	150.00	0.49	150.00	100.00	50.00
160	0°48.0′	0°38.40′	80.00	0.15	160.00	0.60	160.00	106.67	53.33
170	0°51.0′	0°43.35′	85.00	0.18	170.00	0.71	170.00	113.33	56.67
180	0°54.0′	0°48.60′	90.00	0.21	180.00	0.85	180.00	120.00	60.00
190	0°57.0′	0°54.15′	95.00	0.25	190.00	1.00	190.00	126.67	63.33
200	1°00.0′	1°00.00′	100.00	0.29	199.99	1.16	200.00	133.34	66.67
210	1°03.0′	1°06.15′	105.00	0.34	209.99	1.35	210.00	140.00	70.00
220	1°06.0′	1°12.60′	110.00	0.39	219.99	1.55	220.00	146.67	73.34
230	1°09.0′	1°19.35′	115.00	0.44	229.99	1.77	229.99	153.34	76.67
240	1°12.0′	1°26.40′	120.00	0.50	239.98	2.01	239.99	160.01	80.00
250	1°15.0′	1°33.75′	125.00	0.57	249.98	2.27	249.99	166.67	83.34
260	1°18.0′	1°41.40′	130.00	0.64	259.98	2.56	259.99	173.34	86.67
270	1°21.0′	1°49.35′	135.00	0.72	269.97	2.86	269.99	180.01	90.01
280	1°24.0′	1°57.60′	139.99	0.80	279.97	3.19	279.99	186.68	93.34
290	1°27.0′	2°06.15′	144.99	0.89	289.96	3.55	289.98	193.35	96.68
300	1°30.0′	2°15.00′	149.99	0.98	299.95	3.93	299.98	200.02	100.01
310	1°33.0′	2°24.15′	154.99	1.08	309.95	4.33	309.98	206.69	103.35
320	1°36.0′	2°33.60′	159.99	1.19	319.94	4.77	319.97	213.36	106.69
330	1°39.0′	2°43.35′	164.99	1.31	329.93	5.23	329.97	220.03	110.02
340	1°42.0′	2°53.40′	169.99	1.43	339.91	5.72	339.96	226.70	113.36
350	1°45.0′	3°03.75′	174.98	1.56	349.90	6.23	349.96	233.37	116.70
360	1°48.0′	3°14.40′	179.98	1.70	359.88	6.78	359.95	240.04	120.04
370	1°51.0′	3°25.35′	184.98	1.84	369.87	7.37	369.94	246.71	123.38
380	1°54.0′	3°36.60′	189.97	1.99	379.85	7.98	379.93	253.39	126.71
390	1°57.0′	3°48.15′	194.97	2.16	389.83	8.62	389.92	260.06	130.05
400	2°00.0′	4°00.00′	199.97	2.33	399.81	9.31	399.91	266.73	133.40
410	2°03.0′	4°12.15′	204.96	2.51	409.78	10.02	409.90	273.41	136.74
420	2°06.0′	4°24.60′	209.96	2.69	419.75	10.77	419.89	280.09	140.08
430	2°09.0′	4°37.35′	214.95	2.89	429.72	11.56	429.88	286.76	143.42
440	2°12.0′	4°50.40′	219.95	3.10	439.69	12.38	439.86	293.44	146.77
450	2°15.0′	5°03.75′	224.94	3.31	449.65	13.25	449.84	300.12	150.11
460	2°18.0′	5°17.40′	229.93	3.54	459.61	14.15	459.83	306.80	153.46
470	2°21.0′	5°31.35′	234.93	3.77	469.56	15.09	469.81	313.49	156.81
480	2°24.0′	5°45.60′	239.92	4.02	479.52	16.07	479.78	320.17	160.15
490	2°27.0′	6°00.15′	244.91	4.28	489.46	17.10	489.76	326.85	163.50
500	2°30.0′	6°15.00′	249.90	4.54	499.41	18.17	499.74	333.54	166.86

TABLE V, THE STANDARD HIGHWAY SPIRAL

a = 0.5—Continued

L	D	S	q	p	X	Y	C	U	V
510	2°33.0′	6°30.15′	254.89	4.82	509.34	19.28	509.71	340.23	170.21
520	2°36.0′	6°45.60′	259.88	5.11	519.28	20.43	519.68	346.92	173.56
530	2°39.0′	7°01.35′	264.87	5.41	529.20	21.63	529.65	353.61	176.92
540	2°42.0′	7°17.40′	269.85	5.72	539.13	22.88	539.61	360.31	180.28
550	2°45.0′	7°33.75′	274.84	6.05	549.04	24.17	549.57	367.00	183.64
560	2°48.0′	7°50.40′	279.83	6.38	558.95	25.51	559.53	373.70	187.00
570	2°51.0′	8°07.35′	284.81	6.73	568.86	26.90	569.49	380.40	190.36
580	2°54.0′	8°24.60′	289.79	7.09	578.75	28.33	579.44	387.10	193.73
590	2°57.0′	8°42.15′	294.77	7.46	588.64	29.82	589.40	393.81	197.10
600	3°00.0′	9°00.00′	299.75	7.85	598.52	31.36	599.34	400.52	200.47
610	3°03.0′	9°18.15′	304.73	8.25	608.39	32.95	609.29	407.23	203.85
620	3°06.0′	9°36.60′	309.71	8.66	618.26	34.59	619.23	413.94	207.22
630	3°09.0′	9°55.35′	314.69	9.08	628.11	36.29	629.16	420.66	210.60
640	3°12.0′	10°14.40′	319.66	9.52	637.96	38.04	639.09	427.38	213.98
650	3°15.0′	10°33.75′	324.63	9.97	647.79	39.85	649.02	434.11	217.37
660	3°18.0′	10°53.40′	329.60	10.44	657.62	41.71	658.94	440.84	220.76
670	3°21.0′	11°13.35′	334.57	10.92	667.43	43.62	668.86	447.57	224.15
680	3°24.0′	11°33.60′	339.54	11.42	677.24	45.60	678.77	454.30	227.55
690	3°27.0′	11°54.15′	344.50	11.93	687.03	47.63	688.68	461.04	230.95
700	3°30.0′	12°15.00′	349.47	12.45	696.81	49.72	698.58	467.79	234.35
710	3°33.0′	12°36.15′	354.43	12.99	706.57	51.88	708.47	474.54	237.76
720	3°36.0′	12°57.60′	359.39	13.55	716.32	54.09	718.36	481.29	241.18
730	3°39.0′	13°19.35′	364.34	14.12	726.06	56.36	728.25	488.05	244.59
740	3°42.0′	13°41.40′	369.30	14.70	735.79	58.70	738.12	494.82	248.02
750	3°45.0′	14°03.75′	374.25	15.31	745.49	61.10	747.99	501.59	251.44
760	3°48.0′	14°26.40′	379.20	15.93	755.19	63.56	757.86	508.36	254.88
770	3°51.0′	14°49.35′	384.14	16.56	764.86	66.08	767.71	515.14	258.31
780	3°54.0′	15°12.60′	389.09	17.21	774.52	68.67	777.56	521.93	261.76
790	3°57.0′	15°36.15′	394.03	17.88	784.16	71.33	787.40	528.73	265.21
800	4°00.0′	16°00.00′	398.96	18.57	793.78	74.05	797.23	535.53	268.66
810	4°03.0′	16°24.15′	403.90	19.27	803.39	76.84	807.05	542.34	272.13
820	4°06.0′	16°48.60′	408.83	19.99	812.97	79.70	816.87	549.15	275.59
830	4°09.0′	17°13.35′	413.75	20.72	822.53	82.63	826.67	555.98	279.07
840	4°12.0′	17°38.40′	418.68	21.48	832.07	85.62	836.47	562.81	282.55
850	4°15.0′	18°03.75′	423.60	22.25	841.59	88.69	846.25	569.64	286.04
860	4°18.0′	18°29.40′	428.51	23.04	851.09	91.82	856.03	576.49	289.54
870	4°21.0′	18°55.35′	433.42	23.85	860.56	95.03	865.79	583.35	293.05
880	4°24.0′	19°21.60′	438.33	24.68	870.01	98.31	875.54	590.21	296.56
890	4°27.0′	19°48.15′	443.23	25.52	879.43	101.66	885.28	597.09	300.08
900	4°30.0′	20°15.00′	448.13	26.39	888.82	105.09	895.01	603.97	303.62
910	4°33.0′	20°42.15′	453.03	27.27	898.19	108.58	904.73	610.87	307.16
920	4°36.0′	21°09.60′	457.92	28.18	907.53	112.16	914.44	617.77	310.71
930	4°39.0′	21°37.35′	462.80	29.10	916.84	115.80	924.13	624.69	314.27
940	4°42.0′	22°05.40′	467.68	30.04	926.12	119.53	933.80	631.62	317.84
950	4°45.0′	22°33.75′	472.56	31.00	935.37	123.33	943.47	638.56	321.42
960	4°48.0′	23°02.40′	477.42	31.98	944.59	127.20	953.12	645.51	325.01
970	4°51.0′	23°31.35′	482.29	32.99	953.78	131.15	962.75	652.47	328.62
980	4°54.0′	24°00.60′	487.15	34.01	962.93	135.18	972.37	659.45	332.23
990	4°57.0′	24°30.15′	492.00	35.05	972.05	139.29	981.98	666.44	335.86
1000	5°00.0′	25°00.00′	496.84	36.11	981.13	143.48	991.56	673.44	339.50

TABLE V, THE STANDARD HIGHWAY SPIRAL

a = 0.6

L	D	S	q	p	x	y	C	U	V
10	0°03.6′	0°00.18′	5.00	0.00	10.00	0.00	10.00	6.67	3.33
20	0°07.2′	0°00.72′	10.00	0.00	20.00	0.00	20.00	13.33	6.67
30	0°10.8′	0°01.62′	15.00	0.00	30.00	0.00	30.00	20.00	10.00
40	0°14.4′	0°02.88′	20.00	0.00	40.00	0.01	40.00	26.67	13.33
50	0°18.0′	0°04.50′	25.00	0.01	50.00	0.02	50.00	33.33	16.67
60	0°21.6′	0°06.48′	30.00	0.01	60.00	0.04	60.00	40.00	20.00
70	0°25.2′	0°08.82′	35.00	0.01	70.00	0.06	70.00	46.67	23.33
80	0°28.8′	0°11.52′	40.00	0.02	80.00	0.09	80.00	53.33	26.67
90	0°32.4′	0°14.58′	45.00	0.03	90.00	0.13	90.00	60.00	30.00
100	0°36.0′	0°18.00′	50.00	0.04	100.00	0.17	100.00	66.67	33.33
110	0°39.6′	0°21.78′	55.00	0.06	110.00	0.23	110.00	73.33	36.67
120	0°43.2′	0°25.92′	60.00	0.08	120.00	0.30	120.00	80.00	40.00
130	0°46.8′	0°30.42′	65.00	0.10	130.00	0.38	130.00	86.67	43.33
140	0°50.4′	0°35.28′	70.00	0.12	140.00	0.48	140.00	93.33	46.67
150	0°54.0′	0°40.50′	75.00	0.15	150.00	0.59	150.00	100.00	50.00
160	0°57.6′	0°46.08′	80.00	0.18	160.00	0.71	160.00	106.67	53.33
170	1°01.2′	0°52.02′	85.00	0.21	170.00	0.86	170.00	113.33	56.67
180	1°04.8′	0°58.32′	90.00	0.25	179.99	1.02	180.00	120.00	60.00
190	1°08.4′	1°04.98′	95.00	0.30	189.99	1.20	190.00	126.67	63.34
200	1°12.0′	1°12.00′	100.00	0.35	199.99	1.40	200.00	133.34	66.67
210	1°15.6′	1°19.38′	105.00	0.40	209.99	1.62	210.00	140.00	70.00
220	1°19.2′	1°27.12′	110.00	0.46	219.99	1.86	219.99	146.67	73.34
230	1°22.8′	1°35.22′	115.00	0.53	229.98	2.12	229.99	153.34	76.67
240	1°26.4′	1°43.68′	120.00	0.60	239.98	2.41	239.99	160.01	80.01
250	1°30.0′	1°52.50′	125.00	0.68	249.97	2.73	249.99	166.68	83.34
260	1°33.6′	2°01.68′	129.99	0.77	259.97	3.07	259.99	173.34	86.68
270	1°37.2′	2°11.22′	134.99	0.86	269.96	3.43	269.98	180.01	90.01
280	1°40.8′	2°21.12′	139.99	0.96	279.95	3.83	279.98	186.68	93.35
290	1°44.4′	2°31.38′	144.99	1.06	289.94	4.26	289.97	193.35	96.68
300	1°48.0′	2°42.00′	149.99	1.18	299.93	4.71	299.97	200.02	100.02
310	1°51.6′	2°52.98′	154.99	1.30	309.92	5.20	309.97	206.69	103.36
320	1°55.2′	3°04.32′	159.98	1.43	319.91	5.72	319.96	213.37	106.70
330	1°58.8′	3°16.02′	164.98	1.57	329.89	6.27	329.95	220.04	110.03
340	2°02.4′	3°28.08′	169.98	1.71	339.88	6.86	339.94	226.71	113.37
350	2°06.0′	3°40.50′	174.98	1.87	349.86	7.48	349.94	233.38	116.71
360	2°09.6′	3°53.28′	179.97	2.04	359.83	8.14	359.93	240.06	120.05
370	2°13.2′	4°06.42′	184.97	2.21	369.81	8.84	369.92	246.73	123.39
380	2°16.8′	4°19.92′	189.96	2.39	379.78	9.57	379.90	253.41	126.74
390	2°20.4′	4°33.78′	194.96	2.59	389.75	10.35	389.89	260.09	130.08
400	2°24.0′	4°48.00′	199.95	2.79	399.72	11.16	399.88	266.76	133.42
410	2°27.6′	5°02.58′	204.95	3.01	409.68	12.02	409.86	273.44	136.77
420	2°31.2′	5°17.52′	209.94	3.23	419.64	12.92	419.84	280.13	140.11
430	2°34.8′	5°32.82′	214.93	3.47	429.60	13.87	429.82	286.81	143.46
440	2°38.4′	5°48.48′	219.92	3.72	439.55	14.86	439.80	293.49	146.81
450	2°42.0′	6°04.50′	224.92	3.97	449.49	15.89	449.78	300.18	150.16
460	2°45.6′	6°20.88′	229.91	4.25	459.44	16.97	459.75	306.86	153.51
470	2°49.2′	6°37.62′	234.90	4.53	469.37	18.10	469.72	313.55	156.87
480	2°52.8′	6°54.72′	239.88	4.82	479.30	19.28	479.69	320.24	160.22
490	2°56.4′	7°12.18′	244.87	5.13	489.23	20.51	489.66	326.94	163.58
500	3°00.0′	7°30.00′	249.86	5.45	499.14	21.79	499.62	333.63	166.94

TABLE V, THE STANDARD HIGHWAY SPIRAL

a = 0.6—Continued

L	D	S	q	p	x	y	C	U	V
510	3°03.6′	7°48.18′	254.84	5.78	509.05	23.12	509.58	340.33	170.30
520	3°07.2′	8°06.72′	259.83	6.13	518.96	24.51	519.54	347.03	173.66
530	3°10.8′	8°25.62′	264.81	6.49	528.85	25.94	529.49	353.73	177.03
540	3°14.4′	8°44.88′	269.79	6.86	538.74	27.44	539.44	360.44	180.40
550	3°18.0′	9°04.50′	274.77	7.25	548.62	28.99	549.39	367.15	183.77
560	3°21.6′	9°24.48′	279.75	7.66	558.49	30.59	559.33	373.86	187.15
570	3°25.2′	9°44.82′	284.73	8.07	568.35	32.26	569.27	380.58	190.53
580	3°28.8′	10°05.52′	289.70	8.50	578.20	33.98	579.20	387.30	193.91
590	3°32.4′	10°26.58′	294.67	8.95	588.04	35.76	589.13	394.02	197.29
600	3°36.0′	10°48.00′	299.65	9.41	597.87	37.60	599.05	400.75	200.68
610	3°39.6′	11°09.78′	304.61	9.89	607.69	39.51	608.97	407.48	204.07
620	3°43.2′	11°31.92′	309.58	10.38	617.49	41.48	618.88	414.21	207.47
630	3°46.8′	11°54.42′	314.55	10.89	627.28	43.51	628.79	420.95	210.87
640	3°50.4′	12°17.28′	319.51	11.42	637.06	45.60	638.69	427.70	214.27
650	3°54.0′	12°40.50′	324.47	11.96	646.83	47.76	648.59	434.45	217.68
660	3°57.6′	13°04.08′	329.43	12.52	656.57	49.99	658.48	441.20	221.10
670	4°01.2′	13°28.02′	334.38	13.10	666.31	52.29	668.36	447.97	224.52
680	4°04.8′	13°52.32′	339.34	13.69	676.02	54.65	678.23	454.73	227.94
690	4°08.4′	14°16.98′	344.29	14.30	685.72	57.08	688.10	461.51	231.37
700	4°12.0′	14°42.00′	349.23	14.93	695.41	59.58	697.95	468.29	234.81
710	4°15.6′	15°07.38′	354.18	15.58	705.07	62.16	707.80	475.07	238.25
720	4°19.2′	15°33.12′	359.12	16.24	714.71	64.80	717.65	481.87	241.70
730	4°22.8′	15°59.22′	364.05	16.93	724.34	67.52	727.48	488.67	245.15
740	4°26.4′	16°25.68′	368.99	17.63	733.94	70.31	737.30	495.47	248.61
750	4°30.0′	16°52.50′	373.92	18.35	743.52	73.18	747.11	502.29	252.08
760	4°33.6′	17°19.68′	378.84	19.09	753.08	76.12	756.92	509.12	255.56
770	4°37.2′	17°47.22′	383.77	19.85	762.61	79.13	766.71	515.95	259.05
780	4°40.8′	18°15.12′	388.68	20.63	772.12	82.23	776.49	522.79	262.54
790	4°44.4′	18°43.38′	393.60	21.43	781.61	85.40	786.26	529.64	266.04
800	4°48.0′	19°12.00′	398.51	22.25	791.06	88.65	796.01	536.50	269.55
810	4°51.6′	19°40.98′	403.41	23.09	800.49	91.97	805.76	543.38	273.07
820	4°55.2′	20°10.32′	408.31	23.95	809.89	95.38	815.49	550.26	276.60
830	4°58.8′	20°40.02′	413.21	24.83	819.27	98.87	825.21	557.15	280.14
840	5°02.4′	21°10.08′	418.10	25.74	828.61	102.44	834.92	564.06	283.69
850	5°06.0′	21°40.50′	422.98	26.66	837.92	106.09	844.61	570.97	287.25
860	5°09.6′	22°11.28′	427.86	27.60	847.19	109.83	854.28	577.90	290.83
870	5°13.2′	22°42.42′	432.73	28.57	856.43	113.65	863.94	584.84	294.41
880	5°16.8′	23°13.92′	437.60	29.56	865.64	117.55	873.59	591.80	298.01
890	5°20.4′	23°45.78′	442.46	30.57	874.81	121.54	883.21	598.77	301.61
900	5°24.0′	24°18.00′	447.32	31.61	883.95	125.61	892.83	605.75	305.24
910	5°27.6′	24°50.58′	452.16	32.66	893.04	129.77	902.42	612.75	308.87
920	5°31.2′	25°23.52′	457.00	33.74	902.09	134.01	911.99	619.76	312.52
930	5°34.8′	25°56.82′	461.84	34.84	911.11	138.34	921.55	626.79	316.19
940	5°38.4′	26°30.48′	466.67	35.97	920.08	142.76	931.09	633.84	319.86
950	5°42.0′	27°04.50′	471.49	37.11	929.00	147.27	940.61	640.90	323.56
960	5°45.6′	27°38.88′	476.30	38.28	937.89	151.87	950.10	647.98	327.27
970	5°49.2′	28°13.62′	481.10	39.48	946.72	156.55	959.58	655.08	331.00
980	5°52.8′	28°48.72′	485.90	40.70	955.51	161.33	969.03	662.20	334.74
990	5°56.4′	29°24.18′	490.69	41.94	964.24	166.19	978.46	669.34	338.51
1000	6°00.0′	30°00.00′	495.47	43.21	972.93	171.14	987.87	676.50	342.29

TABLE V, THE STANDARD HIGHWAY SPIRAL

$a = 0.7$

L	D	S	q	p	X	Y	C	U	V
10	0°04.2′	0°00.21′	5.00	0.00	10.00	0.00	10.00	6.67	3.33
20	0°08.4′	0°00.84′	10.00	0.00	20.00	0.00	20.00	13.33	6.67
30	0°12.6′	0°01.89′	15.00	0.00	30.00	0.01	30.00	20.00	10.00
40	0°16.8′	0°03.36′	20.00	0.00	40.00	0.01	40.00	26.67	13.33
50	0°21.0′	0°05.25′	25.00	0.01	50.00	0.03	50.00	33.33	16.67
60	0°25.2′	0°07.56′	30.00	0.01	60.00	0.04	60.00	40.00	20.00
70	0°29.4′	0°10.29′	35.00	0.02	70.00	0.07	70.00	46.67	23.33
80	0°33.6′	0°13.44′	40.00	0.03	80.00	0.10	80.00	53.33	26.67
90	0°37.8′	0°17.01′	45.00	0.04	90.00	0.15	90.00	60.00	30.00
100	0°42.0′	0°21.00′	50.00	0.05	100.00	0.20	100.00	66.67	33.33
110	0°46.2′	0°25.41′	55.00	0.07	110.00	0.27	110.00	73.33	36.67
120	0°50.4′	0°30.24′	60.00	0.09	120.00	0.35	120.00	80.00	40.00
130	0°54.6′	0°35.49′	65.00	0.11	130.00	0.45	130.00	86.67	43.33
140	0°58.8′	0°41.16′	70.00	0.14	140.00	0.56	140.00	93.33	46.67
150	1°03.0′	0°47.25′	75.00	0.17	150.00	0.69	150.00	100.00	50.00
160	1°07.2′	0°53.76′	80.00	0.21	160.00	0.83	160.00	106.67	53.33
170	1°11.4′	1°00.69′	85.00	0.25	169.99	1.00	170.00	113.34	56.67
180	1°15.6′	1°08.04′	90.00	0.30	179.99	1.19	180.00	120.00	60.00
190	1°19.8′	1°15.81′	95.00	0.35	189.99	1.40	190.00	126.67	63.34
200	1°24.0′	1°24.00′	100.00	0.41	199.99	1.63	199.99	133.34	66.67
210	1°28.2′	1°32.61′	105.00	0.47	209.98	1.89	209.99	140.01	70.00
220	1°32.4′	1°41.64′	110.00	0.54	219.98	2.17	219.99	146.67	73.34
230	1°36.6′	1°51.09′	115.00	0.62	229.98	2.48	229.99	153.34	76.67
240	1°40.8′	2°00.96′	120.00	0.70	239.97	2.81	239.99	160.01	80.01
250	1°45.0′	2°11.25′	124.99	0.80	249.96	3.18	249.98	166.63	83.34
260	1°49.2′	2°21.96′	129.99	0.89	259.96	3.58	259.98	173.35	86.68
270	1°53.4′	2°33.09′	134.99	1.00	269.95	4.01	269.98	180.02	90.02
280	1°57.6′	2°44.64′	139.99	1.12	279.94	4.47	279.97	186.69	93.35
290	2°01.8′	2°56.61′	144.99	1.24	289.92	4.97	289.97	193.36	96.69
300	2°06.0′	3°09.00′	149.98	1.37	299.91	5.50	299.96	200.03	100.03
310	2°10.2′	3°21.81′	154.98	1.52	309.89	6.06	309.95	206.70	103.37
320	2°14.4′	3°35.04′	159.98	1.67	319.87	6.67	319.94	213.38	106.71
330	2°18.6′	3°48.69′	164.98	1.83	329.85	7.32	329.94	220.05	110.05
340	2°22.8′	4°02.76′	169.97	2.00	339.83	8.00	339.92	226.73	113.39
350	2°27.0′	4°17.25′	174.97	2.18	349.80	8.73	349.91	233.40	116.73
360	2°31.2′	4°32.16′	179.96	2.37	359.77	9.50	359.90	240.08	120.07
370	2°35.4′	4°47.49′	184.96	2.58	369.74	10.31	369.88	246.76	123.42
380	2°39.6′	5°03.24′	189.95	2.79	379.70	11.17	379.87	253.44	126.76
390	2°43.8′	5°19.41′	194.94	3.02	389.66	12.07	389.85	260.12	130.11
400	2°48.0′	5°36.00′	199.94	3.26	399.62	13.02	399.83	266.80	133.45
410	2°52.2′	5°53.01′	204.93	3.51	409.57	14.02	409.81	273.48	136.80
420	2°56.4′	6°10.44′	209.92	3.77	419.51	15.07	419.78	280.17	140.15
430	3°00.6′	6°28.29′	214.91	4.05	429.45	16.17	429.76	286.86	143.51
440	3°04.8′	6°46.56′	219.90	4.33	439.38	17.33	439.73	293.55	146.86
450	3°09.0′	7°05.25′	224.89	4.64	449.31	18.53	449.69	300.24	150.22
460	3°13.2′	7°24.36′	229.87	4.95	459.23	19.80	459.66	306.94	153.58
470	3°17.4′	7°43.89′	234.86	5.28	469.14	21.11	469.62	313.63	156.94
480	3°21.6′	8°03.84′	239.84	5.63	479.05	22.49	479.58	320.33	160.30
490	3°25.8′	8°24.21′	244.82	5.98	488.95	23.92	489.53	327.04	163.67
500	3°30.0′	8°45.00′	249.81	6.36	498.84	25.41	499.48	333.74	167.04

TABLE V, THE STANDARD HIGHWAY SPIRAL

a = 0.7—Continued

L	D	S	q	p	X	Y	C	U	V
510	3°34.2′	9°06.21′	254.79	6.75	508.71	26.96	509.43	340.45	170.41
520	3°38.4′	9°27.84′	259.76	7.15	518.58	28.58	519.37	347.16	173.78
530	3°42.6′	9°49.89′	264.74	7.57	528.44	30.25	529.31	353.88	177.16
540	3°46.8′	10°12.36′	269.71	8.01	538.29	31.99	539.24	360.60	180.55
550	3°51.0′	10°35.25′	274.69	8.46	548.12	33.80	549.17	367.32	183.93
560	3°55.2′	10°58.56′	279.66	8.93	557.95	35.67	559.09	374.05	187.32
570	3°59.4′	11°22.29′	284.63	9.41	567.76	37.60	569.00	380.79	190.72
580	4°03.6′	11°46.44′	289.59	9.92	577.56	39.61	578.91	387.53	194.11
590	4°07.8′	12°11.01′	294.56	10.44	587.34	41.68	588.82	394.27	197.52
600	4°12.0′	12°36.00′	299.52	10.98	597.10	43.83	598.71	401.02	200.93
610	4°16.2′	13°01.41′	304.48	11.53	606.86	46.05	608.60	407.77	204.34
620	4°20.4′	13°27.24′	309.43	12.11	616.59	48.34	618.48	414.53	207.76
630	4°24.6′	13°53.49′	314.38	12.70	626.31	50.70	628.36	421.30	211.18
640	4°28.8′	14°20.16′	319.33	13.31	636.00	53.14	638.22	428.07	214.61
650	4°33.0′	14°47.25′	324.28	13.95	645.68	55.65	648.08	434.85	218.05
660	4°37.2′	15°14.76′	329.22	14.60	655.34	58.25	657.93	441.64	221.49
670	4°41.4′	15°42.69′	334.16	15.27	664.98	60.91	667.76	448.44	224.95
680	4°45.6′	16°11.04′	339.10	15.96	674.59	63.66	677.59	455.24	228.40
690	4°49.8′	16°39.81′	344.03	16.67	684.19	66.49	687.41	462.05	231.87
700	4°54.0′	17°09.00′	348.96	17.40	693.75	69.40	697.22	468.88	235.34
710	4°58.2′	17°38.61′	353.88	18.16	703.30	72.39	707.01	475.71	238.83
720	5°02.4′	18°08.64′	358.80	18.93	712.81	75.46	716.80	482.55	242.32
730	5°06.6′	18°39.09′	363.71	19.73	722.30	78.61	726.57	489.40	245.82
740	5°10.8′	19°09.96′	368.62	20.55	731.76	81.86	736.33	496.26	249.33
750	5°15.0′	19°41.25′	373.53	21.39	741.19	85.18	746.07	503.13	252.85
760	5°19.2′	20°12.96′	378.43	22.25	750.59	88.59	755.80	510.01	256.38
770	5°23.4′	20°45.09′	383.32	23.13	759.96	92.09	765.52	516.91	259.92
780	5°27.6′	21°17.64′	388.21	24.04	769.29	95.68	775.22	523.81	263.47
790	5°31.8′	21°50.61′	393.09	24.97	778.59	99.36	784.91	530.73	267.03
800	5°36.0′	22°24.00′	397.97	25.92	787.86	103.12	794.58	537.67	270.61
810	5°40.2′	22°57.81′	402.84	26.90	797.09	106.98	804.23	544.61	274.20
820	5°44.4′	23°32.04′	407.71	27.90	806.27	110.92	813.87	551.58	277.80
830	5°48.6′	24°06.69′	412.56	28.92	815.42	114.96	823.49	558.55	281.42
840	5°52.8′	24°41.76′	417.41	29.97	824.53	119.10	833.08	565.55	285.05
850	5°57.0′	25°17.25′	422.26	31.05	833.59	123.32	842.66	572.56	288.70
860	6°01.2′	25°53.16′	427.09	32.14	842.61	127.64	852.22	579.59	292.36
870	6°05.4′	26°29.49′	431.92	33.27	851.58	132.05	861.76	586.63	296.04
880	6°09.6′	27°06.24′	436.74	34.41	860.51	136.56	871.28	593.69	299.73
890	6°13.8′	27°43.41′	441.55	35.59	869.39	141.16	880.77	600.78	303.45
900	6°18.0′	28°21.00′	446.35	36.79	878.21	145.86	890.24	607.88	307.18
910	6°22.2′	28°59.01′	451.15	38.01	886.99	150.66	899.69	615.00	310.93
920	6°26.4′	29°37.44′	455.93	39.26	895.71	155.56	909.12	622.15	314.70
930	6°30.6′	30°16.29′	460.71	40.54	904.37	160.55	918.51	629.31	318.49
940	6°34.8′	30°55.56′	465.47	41.84	912.98	165.64	927.88	636.50	322.30
950	6°39.0′	31°35.25′	470.23	43.17	921.53	170.83	937.23	643.72	326.13
960	6°43.2′	32°15.36′	474.97	44.53	930.02	176.11	946.55	650.96	329.98
970	6°47.4′	32°55.89′	479.71	45.92	938.44	181.50	955.83	658.22	333.86
980	6°51.6′	33°36.84′	484.43	47.33	946.80	186.99	965.09	665.51	337.77
990	6°55.8′	34°18.21′	489.14	48.77	955.10	192.57	974.32	672.83	341.70
1000	7°00.0′	35°00.00′	493.84	50.23	963.32	198.26	983.51	680.18	345.65

TABLE V, THE STANDARD HIGHWAY SPIRAL

a =0.8

L	D	S	q	p	X	Y	C	U	V
10	0°04.8′	0°00.24′	5.00	0.00	10.00	0.00	10.00	6.67	3.33
20	0°09.6′	0°00.96′	10.00	0.00	20.00	0.00	20.00	13.33	6.67
30	0°14.4′	0°02.16′	15.00	0.00	30.00	0.01	30.00	20.00	10.00
40	0°19.2′	0°03.84′	20.00	0.00	40.00	0.01	40.00	26.67	13.33
50	0°24.0′	0°06.00′	25.00	0.01	50.00	0.03	50.00	33.33	16.67
60	0°28.8′	0°08.64′	30.00	0.01	60.00	0.05	60.00	40.00	20.00
70	0°33.6′	0°11.76′	35.00	0.02	70.00	0.08	70.00	46.67	23.33
80	0°38.4′	0°15.36′	40.00	0.03	80.00	0.12	80.00	53.33	26.67
90	0°43.2′	0°19.44′	45.00	0.04	90.00	0.17	90.00	60.00	30.00
100	0°48.0′	0°24.00′	50.00	0.06	100.00	0.23	100.00	66.67	33.33
110	0°52.8′	0°29.04′	55.00	0.08	110.00	0.31	110.00	73.33	36.67
120	0°57.6′	0°34.56′	60.00	0.10	120.00	0.40	120.00	80.00	40.00
130	1°02.4′	0°40.56′	65.00	0.13	130.00	0.51	130.00	86.67	43.33
140	1°07.2′	0°47.04′	70.00	0.16	140.00	0.64	140.00	93.33	46.67
150	1°12.0′	0°54.00′	75.00	0.20	150.00	0.79	150.00	100.00	50.00
160	1°16.8′	1°01.44′	80.00	0.24	159.99	0.95	160.00	106.67	53.33
170	1°21.6′	1°09.36′	85.00	0.29	169.99	1.14	170.00	113.34	56.67
180	1°26.4′	1°17.76′	90.00	0.34	179.99	1.36	180.00	120.00	60.00
190	1°31.2′	1°26.64′	95.00	0.40	189.99	1.60	189.99	126.67	63.34
200	1°36.0′	1°36.00′	100.00	0.47	199.98	1.86	199.99	133.34	66.67
210	1°40.8′	1°45.84′	105.00	0.54	209.98	2.15	209.99	140.01	70.01
220	1°45.6′	1°56.16′	110.00	0.62	219.97	2.48	219.99	146.68	73.34
230	1°50.4′	2°06.96′	114.99	0.71	229.97	2.83	229.99	153.34	76.68
240	1°55.2′	2°18.24′	119.99	0.80	239.96	3.22	239.98	160.01	80.01
250	2°00.0′	2°30.00′	124.99	0.91	249.95	3.64	249.98	166.68	83.35
260	2°04.8′	2°42.24′	129.99	1.02	259.94	4.09	259.97	173.35	86.69
270	2°09.6′	2°54.96′	134.99	1.14	269.93	4.58	269.97	180.02	90.02
280	2°14.4′	3°08.16′	139.99	1.28	279.92	5.11	279.96	186.70	93.36
290	2°19.2′	3°21.84′	144.98	1.42	289.90	5.67	289.96	193.37	96.70
300	2°24.0′	3°36.00′	149.98	1.57	299.88	6.28	299.95	200.04	100.04
310	2°28.8′	3°50.64′	154.98	1.73	309.86	6.93	309.94	206.72	103.38
320	2°33.6′	4°05.76′	159.97	1.91	319.84	7.62	319.93	213.39	106.72
330	2°38.4′	4°21.36′	164.97	2.09	329.81	8.36	329.92	220.07	110.06
340	2°43.2′	4°37.44′	169.96	2.29	339.78	9.14	339.90	226.74	113.40
350	2°48.0′	4°54.00′	174.96	2.49	349.74	9.97	349.89	233.42	116.75
360	2°52.8′	5°11.04′	179.95	2.71	359.71	10.85	359.87	240.10	120.09
370	2°57.6′	5°28.56′	184.94	2.95	369.66	11.78	369.85	246.78	123.44
380	3°02.4′	5°46.56′	189.94	3.19	379.61	12.76	379.83	253.47	126.79
390	3°07.2′	6°05.04′	194.93	3.45	389.56	13.79	389.80	260.15	130.14
400	3°12.0′	6°24.00′	199.92	3.72	399.50	14.88	399.78	266.84	133.49
410	3°16.8′	6°43.44′	204.91	4.01	409.44	16.02	409.75	273.53	136.85
420	3°21.6′	7°03.36′	209.89	4.31	419.36	17.22	419.72	280.22	140.20
430	3°26.4′	7°23.76′	214.88	4.62	429.28	18.48	429.68	286.92	143.56
440	3°31.2′	7°44.64′	219.87	4.95	439.20	19.80	439.64	293.61	146.92
450	3°36.0′	8°06.00′	224.85	5.30	449.10	21.18	449.60	300.31	150.29
460	3°40.8′	8°27.84′	229.83	5.66	459.00	22.62	459.55	307.02	153.65
470	3°45.6′	8°50.16′	234.81	6.04	468.88	24.12	469.50	313.72	157.02
480	3°50.4′	9°12.96′	239.79	6.43	478.76	25.69	479.45	320.43	160.40
490	3°55.2′	9°36.24′	244.77	6.84	488.63	27.32	489.39	327.15	163.77
500	4°00.0′	10°00.00′	249.75	7.26	498.48	29.03	499.32	333.87	167.15

TABLE V, THE STANDARD HIGHWAY SPIRAL

a = 0.8—Continued

L	D	S	q	p	X	Y	C	U	V
510	4°04.8′	10°24.24′	254.72	7.71	508.32	30.80	509.25	340.59	170.54
520	4°09.6′	10°48.96′	259.69	8.17	518.15	32.64	519.18	347.32	173.92
530	4°14.4′	11°14.16′	264.66	8.65	527.97	34.55	529.09	354.05	177.32
540	4°19.2′	11°39.84′	269.63	9.15	537.77	36.54	539.01	360.78	180.71
550	4°24.0′	12°06.00′	274.59	9.66	547.55	38.59	548.91	367.53	184.12
560	4°28.8′	12°32.64′	279.55	10.20	557.32	40.73	558.81	374.27	187.52
570	4°33.6′	12°59.76′	284.51	10.75	567.07	42.94	568.70	381.03	190.94
580	4°38.4′	13°27.36′	289.47	11.33	576.81	45.23	578.58	387.79	194.35
590	4°43.2′	13°55.44′	294.42	11.92	586.53	47.59	588.45	394.56	197.78
600	4°48.0′	14°24.00′	299.37	12.54	596.22	50.04	598.32	401.33	201.21
610	4°52.8′	14°53.04′	304.32	13.17	605.90	52.57	608.17	408.11	204.65
620	4°57.6′	15°22.56′	309.26	13.83	615.55	55.18	618.02	414.90	208.09
630	5°02.4′	15°52.56′	314.20	14.51	625.18	57.87	627.85	421.70	211.55
640	5°07.2′	16°23.04′	319.13	15.21	634.79	60.65	637.68	428.51	215.01
650	5°12.0′	16°54.00′	324.06	15.93	644.37	63.51	647.49	435.32	218.48
660	5°16.8′	17°25.44′	328.99	16.67	653.92	66.46	657.29	442.15	221.96
670	5°21.6′	17°57.36′	333.91	17.44	663.45	69.50	667.08	448.99	225.44
680	5°26.4′	18°29.76′	338.82	18.22	672.95	72.63	676.86	455.83	228.94
690	5°31.2′	19°02.64′	343.73	19.04	682.42	75.85	686.62	462.69	232.45
700	5°36.0′	19°36.00′	348.64	19.87	691.85	79.15	696.37	469.56	235.97
710	5°40.8′	20°09.84′	353.54	20.73	701.26	82.56	706.10	476.44	239.49
720	5°45.6′	20°44.16′	358.43	21.61	710.63	86.05	715.82	483.34	243.03
730	5°50.4′	21°18.96′	363.32	22.52	719.96	89.64	725.52	490.24	246.59
740	5°55.2′	21°54.24′	368.20	23.45	729.26	93.32	735.20	497.16	250.15
750	6°00.0′	22°30.00′	373.08	24.41	738.52	97.10	744.87	504.10	253.73
760	6°04.8′	23°06.24′	377.95	25.39	747.73	100.97	754.52	511.05	257.32
770	6°09.6′	23°42.96′	382.81	26.40	756.91	104.95	764.15	518.02	260.93
780	6°14.4′	24°20.16′	387.67	27.43	766.05	109.02	773.76	525.00	264.55
790	6°19.2′	24°57.84′	392.51	28.49	775.13	113.19	783.35	532.00	268.19
800	6°24.0′	25°36.00′	397.35	29.58	784.18	117.46	792.92	539.02	271.84
810	6°28.8′	26°14.64′	402.18	30.69	793.17	121.83	802.47	546.06	275.51
820	6°33.6′	26°53.76′	407.01	31.83	802.11	126.30	812.00	553.11	279.20
830	6°38.4′	27°33.36′	411.82	32.99	811.01	130.88	821.50	560.19	282.91
840	6°43.2′	28°13.44′	416.63	34.18	819.84	135.56	830.98	567.29	286.64
850	6°48.0′	28°54.00′	421.42	35.41	828.63	140.34	840.43	574.41	290.38
860	6°52.8′	29°35.04′	426.21	36.65	837.35	145.22	849.85	581.55	294.15
870	6°57.6′	30°16.56′	430.98	37.93	846.02	150.21	859.25	588.72	297.94
880	7°02.4′	30°58.56′	435.75	39.24	854.62	155.31	868.62	595.91	301.75
890	7°07.2′	31°41.04′	440.50	40.57	863.17	160.51	877.96	603.12	305.59
900	7°12.0′	32°24.00′	445.25	41.93	871.64	165.81	887.27	610.37	309.45
910	7°16.8′	33°07.44′	449.98	43.32	880.05	171.22	896.55	617.64	313.33
920	7°21.6′	33°51.36′	454.70	44.74	888.39	176.74	905.80	624.94	317.24
930	7°26.4′	34°35.76′	459.41	46.19	896.66	182.36	915.02	632.27	321.18
940	7°31.2′	35°20.64′	464.10	47.67	904.86	188.10	924.20	639.63	325.15
950	7°36.0′	36°06.00′	468.78	49.18	912.97	193.93	933.34	647.02	329.15
960	7°40.8′	36°51.84′	473.45	50.72	921.01	199.88	942.45	654.45	333.18
970	7°45.6′	37°38.16′	478.11	52.29	928.97	205.93	951.53	661.91	337.24
980	7°50.4′	38°24.96′	482.75	53.89	936.85	212.09	960.56	669.41	341.33
990	7°55.2′	39°12.24′	487.37	55.52	944.64	218.36	969.55	676.95	345.46
1000	8°00.0′	40°00.00′	491.99	57.18	952.35	224.73	978.51	684.52	349.62

TABLE V, THE STANDARD HIGHWAY SPIRAL

a = 0.9

L	D	S	q	p	X	Y	C	U	V
10	0°05.4′	0°00.27′	5.00	0.00	10.00	0.00	10.00	6.67	3.33
20	0°10.8′	0°01.08′	10.00	0.00	20.00	0.00	20.00	13.33	6.67
30	0°16.2′	0°02.43′	15.00	0.00	30.00	0.01	30.00	20.00	10.00
40	0°21.6′	0°04.32′	20.00	0.00	40.00	0.02	40.00	26.67	13.33
50	0°27.0′	0°06.75′	25.00	0.01	50.00	0.03	50.00	33.33	16.67
60	0°32.4′	0°09.72′	30.00	0.01	60.00	0.06	60.00	40.00	20.00
70	0°37.8′	0°13.23′	35.00	0.02	70.00	0.09	70.00	46.67	23.33
80	0°43.2′	0°17.28′	40.00	0.03	80.00	0.13	80.00	53.33	26.67
90	0°48.6′	0°21.87′	45.00	0.05	90.00	0.19	90.00	60.00	30.00
100	0°54.0′	0°27.00′	50.00	0.07	100.00	0.26	100.00	66.67	33.33
110	0°59.4′	0°32.67′	55.00	0.09	110.00	0.35	110.00	73.33	36.67
120	1°04.8′	0°38.88′	60.00	0.11	120.00	0.45	120.00	80.00	40.00
130	1°10.2′	0°45.63′	65.00	0.14	130.00	0.58	130.00	86.67	43.33
140	1°15.6′	0°52.92′	70.00	0.18	140.00	0.72	140.00	93.33	46.67
150	1°21.0′	1°00.75′	75.00	0.22	150.00	0.88	150.00	100.00	50.00
160	1°26.4′	1°09.12′	80.00	0.27	159.99	1.07	160.00	106.67	53.34
170	1°31.8′	1°18.03′	85.00	0.32	169.99	1.29	170.00	113.34	56.67
180	1°37.2′	1°27.48′	90.00	0.38	179.99	1.53	179.99	120.00	60.00
190	1°42.6′	1°37.47′	95.00	0.45	189.98	1.80	189.99	126.67	63.34
200	1°48.0′	1°48.00′	100.00	0.52	199.98	2.09	199.99	133.34	66.67
210	1°53.4′	1°59.07′	105.00	0.61	209.97	2.42	209.99	140.01	70.01
220	1°58.8′	2°10.68′	109.99	0.70	219.97	2.79	219.99	146.68	73.34
230	2°04.2′	2°22.83′	114.99	0.80	229.96	3.18	229.98	153.35	76.68
240	2°09.6′	2°35.52′	119.99	0.90	239.95	3.62	239.98	160.02	80.02
250	2°15.0′	2°48.75′	124.99	1.02	249.94	4.09	249.97	166.69	83.35
260	2°20.4′	3°02.52′	129.99	1.15	259.93	4.60	259.97	173.36	86.69
270	2°25.8′	3°16.83′	134.99	1.29	269.91	5.15	269.96	180.03	90.03
280	2°31.2′	3°31.68′	139.98	1.44	279.89	5.75	279.95	186.70	93.37
290	2°36.6′	3°47.07′	144.98	1.60	289.87	6.38	289.94	193.38	96.71
300	2°42.0′	4°03.00′	149.98	1.77	299.85	7.07	299.93	200.05	100.05
310	2°47.4′	4°19.47′	154.97	1.95	309.82	7.80	309.92	206.73	103.39
320	2°52.8′	4°36.48′	159.97	2.14	319.79	8.57	319.91	213.41	106.73
330	2°58.2′	4°54.03′	164.96	2.35	329.76	9.40	329.89	220.08	110.08
340	3°03.6′	5°12.12′	169.95	2.57	339.72	10.28	339.88	226.76	113.42
350	3°09.0′	5°30.75′	174.95	2.81	349.68	11.22	349.86	233.45	116.77
360	3°14.4′	5°49.92′	179.94	3.05	359.63	12.21	359.83	240.13	120.12
370	3°19.8′	6°09.63′	184.93	3.31	369.57	13.25	369.81	246.82	123.47
380	3°25.2′	6°29.88′	189.92	3.59	379.51	14.35	379.78	253.50	126.82
390	3°30.6′	6°50.67′	194.91	3.88	389.44	15.51	389.75	260.19	130.18
400	3°36.0′	7°12.00′	199.89	4.19	399.37	16.74	399.72	266.89	133.53
410	3°41.4′	7°33.87′	204.88	4.51	409.29	18.02	409.68	273.58	136.89
420	3°46.8′	7°56.28′	209.87	4.85	419.19	19.37	419.64	280.28	140.26
430	3°52.2′	8°19.23′	214.85	5.20	429.09	20.78	429.60	286.98	143.62
440	3°57.6′	8°42.72′	219.83	5.57	438.98	22.26	439.55	293.69	146.99
450	4°03.0′	9°06.75′	224.81	5.96	448.86	23.81	449.49	300.40	150.36
460	4°08.4′	9°31.32′	229.79	6.36	458.73	25.43	459.44	307.11	153.74
470	4°13.8′	9°56.43′	234.76	6.79	468.59	27.12	469.37	313.83	157.12
480	4°19.2′	10°22.08′	239.74	7.23	478.43	28.89	479.30	320.55	160.50
490	4°24.6′	10°48.27′	244.71	7.69	488.26	30.72	489.23	327.28	163.89
500	4°30.0′	11°15.00′	249.68	8.17	498.08	32.63	499.14	334.01	167.28

TABLE V, THE STANDARD HIGHWAY SPIRAL

a = 0.9—Continued

L	D	S	q	p	X	Y	C	U	V
510	4°35.4′	11°42.27′	254.65	8.67	507.88	34.62	509.05	340.75	170.68
520	4°40.8′	12°10.08′	259.61	9.19	517.66	36.69	518.96	347.49	174.08
530	4°46.2′	12°38.43′	264.57	9.73	527.43	38.84	528.85	354.24	177.49
540	4°51.6′	13°07.32′	269.53	10.29	537.17	41.07	538.74	360.99	180.90
550	4°57.0′	13°36.75′	274.48	10.87	546.90	43.38	548.62	367.76	184.32
560	5°02.4′	14°06.72′	279.43	11.47	556.61	45.78	558.49	374.53	187.75
570	5°07.8′	14°37.23′	284.38	12.09	566.30	48.26	568.35	381.30	191.19
580	5°13.2′	15°08.28′	289.33	12.74	575.96	50.83	578.20	388.09	194.63
590	5°18.6′	15°39.87′	294.27	13.41	585.61	53.48	588.04	394.88	198.08
600	5°24.0′	16°12.00′	299.20	14.10	595.22	56.23	597.87	401.69	201.54
610	5°29.4′	16°44.67′	304.13	14.81	604.81	59.06	607.69	408.50	205.00
620	5°34.8′	17°17.88′	309.06	15.55	614.37	61.99	617.49	415.32	208.48
630	5°40.2′	17°51.63′	313.98	16.31	623.91	65.01	627.28	422.16	211.96
640	5°45.6′	18°25.92′	318.90	17.09	633.41	68.12	637.06	429.00	215.46
650	5°51.0′	19°00.75′	323.81	17.90	642.88	71.33	646.82	435.86	218.96
660	5°56.4′	19°36.12′	328.72	18.74	652.32	74.64	656.57	442.73	222.48
670	6°01.8′	20°12.03′	333.62	19.60	661.72	78.04	666.31	449.61	226.01
680	6°07.2′	20°48.48′	338.51	20.48	671.09	81.55	676.02	456.51	229.55
690	6°12.6′	21°25.47′	343.40	21.39	680.41	85.15	685.72	463.41	233.11
700	6°18.0′	22°03.00′	348.28	22.33	689.70	88.85	695.40	470.34	236.68
710	6°23.4′	22°41.07′	353.15	23.29	698.95	92.66	705.07	477.28	240.26
720	6°28.8′	23°19.68′	358.02	24.28	708.16	96.57	714.71	484.24	243.85
730	6°34.2′	23°58.83′	362.88	25.30	717.32	100.58	724.33	491.21	247.47
740	6°39.6′	24°38.52′	367.73	26.35	726.43	104.69	733.93	498.20	251.10
750	6°45.0′	25°18.75′	372.57	27.42	735.49	108.92	743.51	505.21	254.74
760	6°50.4′	25°59.52′	377.41	28.52	744.51	113.25	753.07	512.24	258.41
770	6°55.8′	26°40.83′	382.23	29.65	753.47	117.68	762.60	519.29	262.09
780	7°01.2′	27°22.68′	387.05	30.81	762.38	122.23	772.11	526.36	265.79
790	7°06.6′	28°05.07′	391.86	31.99	771.23	126.88	781.60	533.45	269.51
800	7°12.0′	28°48.00′	396.65	33.21	780.02	131.64	791.05	540.57	273.25
810	7°17.4′	29°31.47′	401.44	34.45	788.75	136.51	800.48	547.71	277.02
820	7°22.8′	30°15.48′	406.22	35.73	797.42	141.50	809.88	554.87	280.81
830	7°28.2′	31°00.03′	410.98	37.03	806.03	146.59	819.25	562.06	284.62
840	7°33.6′	31°45.12′	415.74	38.37	814.57	151.80	828.59	569.28	288.46
850	7°39.0′	32°30.75′	420.48	39.74	823.04	157.12	837.90	576.53	292.32
860	7°44.4′	33°16.92′	425.21	41.13	831.43	162.55	847.17	583.81	296.21
870	7°49.8′	34°03.63′	429.93	42.56	839.75	168.09	856.41	591.11	300.13
880	7°55.2′	34°50.88′	434.63	44.02	848.00	173.75	865.62	598.45	304.08
890	8°00.6′	35°38.67′	439.32	45.51	856.17	179.52	874.78	605.83	308.06
900	8°06.0′	36°27.00′	444.00	47.03	864.25	185.41	883.92	613.23	312.07
910	8°11.4′	37°15.87′	448.66	48.58	872.25	191.40	893.01	620.68	316.11
920	8°16.8′	38°05.28′	453.31	50.17	880.17	197.52	902.06	628.16	320.19
930	8°22.2′	38°55.23′	457.94	51.79	887.99	203.74	911.07	635.68	324.30
940	8°27.6′	39°45.72′	462.55	53.44	895.73	210.08	920.03	643.24	328.45
950	8°33.0′	40°36.75′	467.15	55.12	903.37	216.53	928.96	650.85	332.65
960	8°38.4′	41°28.32′	471.74	56.83	910.91	223.10	937.83	658.49	336.88
970	8°43.8′	42°20.43′	476.30	58.58	918.35	229.78	946.66	666.19	341.15
980	8°49.2′	43°13.08′	480.85	60.36	925.69	236.57	955.44	673.93	345.47
990	8°54.6′	44°06.27′	485.38	62.18	932.93	243.47	964.17	681.72	349.83
1000	9°00.0′	45°00.00′	489.89	64.03	940.05	250.49	972.85	689.56	354.24

TABLE V, THE STANDARD HIGHWAY SPIRAL

$a = 1.0$

L	D	S	q	p	X	Y	C	U	V
10	0°06.0′	0°00.30′	5.00	0.00	10.00	0.00	10.00	6.67	3.33
20	0°12.0′	0°01.20′	10.00	0.00	20.00	0.00	20.00	13.33	6.67
30	0°18.0′	0°02.70′	15.00	0.00	30.00	0.01	30.00	20.00	10.00
40	0°24.0′	0°04.80′	20.00	0.00	40.00	0.02	40.00	26.67	13.33
50	0°30.0′	0°07.50′	25.00	0.01	50.00	0.04	50.00	33.33	16.67
60	0°36.0′	0°10.80′	30.00	0.02	60.00	0.06	60.00	40.00	20.00
70	0°42.0′	0°14.70′	35.00	0.02	70.00	0.10	70.00	46.67	23.33
80	0°48.0′	0°19.20′	40.00	0.04	80.00	0.15	80.00	53.33	26.67
90	0°54.0′	0°24.30′	45.00	0.05	90.00	0.21	90.00	60.00	30.00
100	1°00.0′	0°30.00′	50.00	0.07	100.00	0.29	100.00	66.67	33.33
110	1°06.0′	0°36.30′	55.00	0.10	110.00	0.39	110.00	73.33	36.67
120	1°12.0′	0°43.20′	60.00	0.13	120.00	0.50	120.00	80.00	40.00
130	1°18.0′	0°50.70′	65.00	0.16	130.00	0.64	130.00	86.67	43.33
140	1°24.0′	0°58.80′	70.00	0.20	140.00	0.80	140.00	93.33	46.67
150	1°30.0′	1°07.50′	75.00	0.25	149.99	0.98	150.00	100.00	50.00
160	1°36.0′	1°16.80′	80.00	0.30	159.99	1.19	160.00	106.67	53.34
170	1°42.0′	1°26.70′	85.00	0.36	169.99	1.43	170.00	113.34	56.67
180	1°48.0′	1°37.20′	90.00	0.42	179.99	1.70	179.99	120.01	60.00
190	1°54.0′	1°48.30′	95.00	0.50	189.98	2.00	189.99	126.67	63.34
200	2°00.0′	2°00.00′	100.00	0.58	199.98	2.33	199.99	133.34	66.67
210	2°06.0′	2°12.30′	104.99	0.67	209.97	2.69	209.99	140.01	70.01
220	2°12.0′	2°25.20′	109.99	0.77	219.96	3.10	219.98	146.68	73.35
230	2°18.0′	2°38.70′	114.99	0.88	229.95	3.54	229.98	153.35	76.68
240	2°24.0′	2°52.80′	119.99	1.01	239.94	4.02	239.97	160.02	80.02
250	2°30.0′	3°07.50′	124.99	1.14	249.93	4.54	249.97	166.69	83.36
260	2°36.0′	3°22.80′	129.98	1.28	259.91	5.11	259.96	173.36	86.70
270	2°42.0′	3°38.70′	134.98	1.43	269.89	5.72	269.95	180.04	90.03
280	2°48.0′	3°55.20′	139.98	1.60	279.87	6.38	279.94	186.71	93.37
290	2°54.0′	4°12.30′	144.97	1.77	289.84	7.09	289.93	193.39	96.72
300	3°00.0′	4°30.00′	149.97	1.96	299.81	7.85	299.92	200.06	100.06
310	3°06.0′	4°48.30′	154.96	2.17	309.78	8.66	309.90	206.74	103.40
320	3°12.0′	5°07.20′	159.96	2.38	319.74	9.53	319.89	213.42	106.75
330	3°18.0′	5°26.70′	164.95	2.61	329.70	10.45	329.87	220.10	110.09
340	3°24.0′	5°46.80′	169.94	2.86	339.65	11.42	339.85	226.79	113.44
350	3°30.0′	6°07.50′	174.93	3.12	349.60	12.46	349.82	233.47	116.79
360	3°36.0′	6°28.80′	179.92	3.39	359.54	13.56	359.80	240.16	120.15
370	3°42.0′	6°50.70′	184.91	3.68	369.47	14.72	369.77	246.85	123.50
380	3°48.0′	7°13.20′	189.90	3.99	379.40	15.94	379.73	253.54	126.86
390	3°54.0′	7°36.30′	194.89	4.31	389.31	17.23	389.69	260.24	130.22
400	4°00.0′	8°00.00′	199.87	4.65	399.22	18.59	399.65	266.94	133.58
410	4°06.0′	8°24.30′	204.85	5.01	409.12	20.02	409.61	273.64	136.95
420	4°12.0′	8°49.20′	209.83	5.38	419.01	21.51	419.56	280.35	140.32
430	4°18.0′	9°14.70′	214.81	5.78	428.88	23.08	429.50	287.06	143.69
440	4°24.0′	9°40.80′	219.79	6.19	438.75	24.73	439.44	293.77	147.07
450	4°30.0′	10°07.50′	224.77	6.62	448.60	26.45	449.38	300.49	150.45
460	4°36.0′	10°34.80′	229.74	7.07	458.43	28.25	459.30	307.22	153.83
470	4°42.0′	11°02.70′	234.71	7.54	468.26	30.12	469.22	313.95	157.22
480	4°48.0′	11°31.20′	239.68	8.03	478.06	32.08	479.14	320.68	160.62
490	4°54.0′	12°00.30′	244.64	8.54	487.85	34.12	489.04	327.42	164.02
500	5°00.0′	12°30.00′	249.60	9.07	497.63	36.24	498.94	334.17	167.43

TABLE V, THE STANDARD HIGHWAY SPIRAL

a = 1.0—Continued

L	D	S	q	p	x	y	C	U	V
510	5°06.0′	13°00.30′	254.56	9.63	507.38	38.44	508.83	340.92	170.84
520	5°12.0′	13°31.20′	259.52	10.20	517.11	40.74	518.71	347.68	174.26
530	5°18.0′	14°02.70′	264.47	10.80	526.82	43.12	528.59	354.45	177.68
540	5°24.0′	14°34.80′	269.42	11.42	536.51	45.59	538.45	361.23	181.12
550	5°30.0′	15°07.50′	274.36	12.07	546.18	48.16	548.30	368.01	184.56
560	5°36.0′	15°40.80′	279.30	12.74	555.82	50.81	558.14	374.81	188.01
570	5°42.0′	16°14.70′	284.24	13.43	565.43	53.56	567.97	381.61	191.47
580	5°48.0′	16°49.20′	289.17	14.15	575.02	56.41	577.78	388.43	194.93
590	5°54.0′	17°24.30′	294.09	14.89	584.58	59.35	587.58	395.25	198.41
600	6°00.0′	18°00.00′	299.02	15.65	594.11	62.39	597.37	402.09	201.90
610	6°06.0′	18°36.30′	303.93	16.44	603.60	65.53	607.15	408.94	205.40
620	6°12.0′	19°13.20′	308.84	17.26	613.06	68.77	616.90	415.80	208.91
630	6°18.0′	19°50.70′	313.74	18.11	622.48	72.11	626.65	422.67	212.43
640	6°24.0′	20°28.80′	318.64	18.98	631.87	75.56	636.37	429.56	215.96
650	6°30.0′	21°07.50′	323.53	19.87	641.22	79.11	646.08	436.46	219.51
660	6°36.0′	21°46.80′	328.42	20.80	650.53	82.77	655.77	443.38	223.07
670	6°42.0′	22°26.70′	333.29	21.75	659.79	86.53	665.44	450.31	226.65
680	6°48.0′	23°07.20′	338.16	22.73	669.01	90.41	675.09	457.26	230.24
690	6°54.0′	23°48.30′	343.02	23.74	678.18	94.39	684.72	464.23	233.85
700	7°00.0′	24°30.00′	347.88	24.78	687.31	98.48	694.33	471.22	237.47
710	7°06.0′	25°12.30′	352.72	25.85	696.38	102.68	703.91	478.22	241.12
720	7°12.0′	25°55.20′	357.56	26.95	705.40	107.00	713.47	485.25	244.78
730	7°18.0′	26°38.70′	362.38	28.07	714.37	111.42	723.01	492.30	248.46
740	7°24.0′	27°22.80′	367.20	29.23	723.28	115.97	732.52	499.37	252.16
750	7°30.0′	28°07.50′	372.01	30.42	732.13	120.62	742.00	506.46	255.88
760	7°36.0′	28°52.80′	376.80	31.64	740.92	125.39	751.45	513.58	259.63
770	7°42.0′	29°38.70′	381.59	32.88	749.64	130.28	760.88	520.72	263.40
780	7°48.0′	30°25.20′	386.36	34.17	758.30	135.29	770.27	527.89	267.19
790	7°54.0′	31°12.30′	391.13	35.48	766.89	140.41	779.63	535.09	271.01
800	8°00.0′	32°00.00′	395.88	36.82	775.40	145.65	788.96	542.32	274.85
810	8°06.0′	32°48.30′	400.61	38.20	783.85	151.01	798.26	549.57	278.72
820	8°12.0′	33°37.20′	405.34	39.61	792.21	156.48	807.52	556.86	282.63
830	8°18.0′	34°26.70′	410.05	41.05	800.50	162.08	816.74	564.18	286.56
840	8°24.0′	35°16.80′	414.75	42.52	808.71	167.80	825.93	571.54	290.52
850	8°30.0′	36°07.50′	419.43	44.03	816.83	173.63	835.08	578.93	294.52
860	8°36.0′	36°58.80′	424.10	45.57	824.86	179.59	844.18	586.36	298.55
870	8°42.0′	37°50.70′	428.75	47.15	832.80	185.66	853.25	593.83	302.62
880	8°48.0′	38°43.20′	433.39	48.76	840.65	191.86	862.27	601.34	306.72
890	8°54.0′	39°36.30′	438.01	50.40	848.41	198.17	871.24	608.90	310.87
900	9°00.0′	40°30.00′	442.61	52.08	856.06	204.61	880.17	616.49	315.05
910	9°06.0′	41°24.30′	447.19	53.79	863.61	211.16	889.05	624.14	319.28
920	9°12.0′	42°19.20′	451.76	55.54	871.06	217.84	897.89	631.83	323.55
930	9°18.0′	43°14.70′	456.31	57.32	878.40	224.63	906.67	639.57	327.87
940	9°24.0′	44°10.80′	460.84	59.14	885.63	231.54	915.39	647.37	332.23
950	9°30.0′	45°07.50′	465.35	60.99	892.74	238.57	924.07	655.21	336.65
960	9°36.0′	46°04.80′	469.83	62.87	899.74	245.71	932.69	663.12	341.12
970	9°42.0′	47°02.70′	474.30	64.80	906.61	252.97	941.25	671.08	345.64
980	9°48.0′	48°01.20′	478.75	66.75	913.37	260.35	949.75	679.11	350.22
990	9°54.0′	49°00.30′	483.17	68.75	919.99	267.84	958.19	687.20	354.86
1000	10°00.0′	50°00.00′	487.57	70.78	926.48	275.44	966.56	695.36	359.57

TABLE V, THE STANDARD HIGHWAY SPIRAL

a = 1.25

L	D	S	q	p	X	Y	C	U	V
10	0°07.5′	0°00.38′	5.00	0.00	10.00	0.00	10.00	6.67	3.33
20	0°15.0′	0°01.50′	10.00	0.00	20.00	0.00	20.00	13.33	6.67
30	0°22.5′	0°03.38′	15.00	0.00	30.00	0.01	30.00	20.00	10.00
40	0°30.0′	0°06.00′	20.00	0.01	40.00	0.02	40.00	26.67	13.33
50	0°37.5′	0°09.38′	25.00	0.01	50.00	0.05	50.00	33.33	16.67
60	0°45.0′	0°13.50′	30.00	0.02	60.00	0.08	60.00	40.00	20.00
70	0°52.5′	0°18.38′	35.00	0.03	70.00	0.12	70.00	46.67	23.33
80	1°00.0′	0°24.00′	40.00	0.05	80.00	0.19	80.00	53.33	26.67
90	1°07.5′	0°30.38′	45.00	0.07	90.00	0.27	90.00	60.00	30.00
100	1°15.0′	0°37.50′	50.00	0.09	100.00	0.36	100.00	66.67	33.33
110	1°22.5′	0°45.38′	55.00	0.12	110.00	0.48	110.00	73.33	36.67
120	1°30.0′	0°54.00′	60.00	0.16	120.00	0.63	120.00	80.00	40.00
130	1°37.5′	1°03.38′	65.00	0.20	130.00	0.80	130.00	86.67	43.33
140	1°45.0′	1°13.50′	70.00	0.25	139.99	1.00	140.00	93.34	46.67
150	1°52.5′	1°24.38′	75.00	0.31	149.99	1.23	150.00	100.00	50.00
160	2°00.0′	1°36.00′	80.00	0.37	159.99	1.49	159.99	106.67	53.34
170	2°07.5′	1°48.38′	85.00	0.45	169.98	1.79	169.99	113.34	56.67
180	2°15.0′	2°01.50′	90.00	0.53	179.98	2.12	179.99	120.01	60.01
190	2°22.5′	2°15.38′	95.00	0.62	189.97	2.49	189.99	126.68	63.34
200	2°30.0′	2°30.00′	99.99	0.73	199.96	2.91	199.98	133.35	66.68
210	2°37.5′	2°45.38′	104.99	0.84	209.95	3.37	209.98	140.02	70.02
220	2°45.0′	3°01.50′	109.99	0.97	219.94	3.87	219.97	146.69	73.35
230	2°52.5′	3°18.38′	114.99	1.11	229.92	4.42	229.97	153.36	76.69
240	3°00.0′	3°36.00′	119.98	1.26	239.91	5.03	239.96	160.03	80.03
250	3°07.5′	3°54.38′	124.98	1.42	249.88	5.68	249.95	166.71	83.37
260	3°15.0′	4°13.50′	129.98	1.60	259.86	6.39	259.94	173.38	86.71
270	3°22.5′	4°33.38′	134.97	1.79	269.83	7.15	269.92	180.06	90.05
280	3°30.0′	4°54.00′	139.97	1.99	279.80	7.98	279.91	186.74	93.40
290	3°37.5′	5°15.38′	144.96	2.22	289.76	8.86	289.89	193.42	96.74
300	3°45.0′	5°37.50′	149.95	2.45	299.71	9.81	299.87	200.10	100.09
310	3°52.5′	6°00.38′	154.94	2.71	309.66	10.82	309.85	206.79	103.44
320	4°00.0′	6°24.00′	159.93	2.98	319.60	11.90	319.82	213.47	106.79
330	4°07.5′	6°48.38′	164.92	3.27	329.53	13.05	329.79	220.16	110.15
340	4°15.0′	7°13.50′	169.91	3.57	339.46	14.28	339.76	226.86	113.51
350	4°22.5′	7°39.38′	174.90	3.89	349.38	15.57	349.72	233.55	116.87
360	4°30.0′	8°06.00′	179.88	4.24	359.28	16.94	359.68	240.25	120.23
370	4°37.5′	8°33.38′	184.86	4.60	369.18	18.39	369.63	246.96	123.60
380	4°45.0′	9°01.50′	189.84	4.98	379.06	19.92	379.58	253.66	126.97
390	4°52.5′	9°30.38′	194.82	5.39	388.93	21.53	389.52	260.38	130.34
400	5°00.0′	10°00.00′	199.80	5.81	398.78	23.22	399.46	267.09	133.72
410	5°07.5′	10°30.38′	204.77	6.26	408.62	25.00	409.39	273.82	137.11
420	5°15.0′	11°01.50′	209.74	6.73	418.45	26.87	419.31	280.54	140.50
430	5°22.5′	11°33.38′	214.71	7.22	428.25	28.83	429.22	287.28	143.89
440	5°30.0′	12°06.00′	219.67	7.73	438.04	30.88	439.13	294.02	147.29
450	5°37.5′	12°39.38′	224.63	8.27	447.81	33.02	449.02	300.77	150.70
460	5°45.0′	13°13.50′	229.59	8.83	457.56	35.26	458.91	307.53	154.12
470	5°52.5′	13°48.38′	234.55	9.42	467.28	37.59	468.79	314.29	157.54
480	6°00.0′	14°24.00′	239.50	10.03	476.98	40.03	478.65	321.07	160.97
490	6°07.5′	15°00.38′	244.44	10.67	486.65	42.57	488.51	327.85	164.41
500	6°15.0′	15°37.50′	249.38	11.33	496.29	45.21	498.35	334.64	167.86

TABLE V, THE STANDARD HIGHWAY SPIRAL

a = 1.25—Continued

L	D	S	q	p	X	Y	C	U	V
510	6°22.5′	16°15.38′	254.32	12.02	505.91	47.96	508.18	341.44	171.31
520	6°30.0′	16°54.00′	259.25	12.74	515.49	50.81	517.99	348.26	174.78
530	6°37.5′	17°33.38′	264.17	13.49	525.05	53.77	527.79	355.09	178.26
540	6°45.0′	18°13.50′	269.09	14.26	534.56	56.84	537.58	361.93	181.75
550	6°52.5′	18°54.38′	274.00	15.07	544.04	60.03	547.34	368.78	185.26
560	7°00.0′	19°36.00′	278.91	15.90	553.48	63.32	557.09	375.65	188.77
570	7°07.5′	20°18.38′	283.81	16.76	562.88	66.74	566.82	382.53	192.30
580	7°15.0′	21°01.50′	288.70	17.65	572.24	70.27	576.54	389.43	195.85
590	7°22.5′	21°45.38′	293.59	18.57	581.55	73.91	586.23	396.35	199.41
600	7°30.0′	22°30.00′	298.46	19.53	590.81	77.68	595.90	403.28	202.98
610	7°37.5′	23°15.38′	303.33	20.51	600.03	81.57	605.55	410.23	206.58
620	7°45.0′	24°01.50′	308.19	21.53	609.19	85.58	615.17	417.21	210.19
630	7°52.5′	24°48.38′	313.04	22.58	618.29	89.71	624.77	424.20	213.82
640	8°00.0′	25°36.00′	317.88	23.66	627.34	93.97	634.34	431.22	217.47
650	8°07.5′	26°24.38′	322.71	24.78	636.33	98.35	643.88	438.25	221.15
660	8°15.0′	27°13.50′	327.53	25.92	645.25	102.86	653.40	445.32	224.84
670	8°22.5′	28°03.38′	332.34	27.11	654.11	107.50	662.89	452.41	228.56
680	8°30.0′	28°54.00′	337.14	28.32	662.90	112.27	672.34	459.53	232.31
690	8°37.5′	29°45.38′	341.92	29.58	671.62	117.17	681.76	466.67	236.08
700	8°45.0′	30°37.50′	346.69	30.86	680.26	122.20	691.15	473.85	239.87
710	8°52.5′	31°30.38′	351.45	32.19	688.83	127.36	700.50	481.05	243.70
720	9°00.0′	32°24.00′	356.20	33.54	697.31	132.65	709.82	488.29	247.56
730	9°07.5′	33°18.38′	360.93	34.94	705.72	138.07	719.10	495.57	251.45
740	9°15.0′	34°13.50′	365.64	36.37	714.03	143.63	728.33	502.88	255.37
750	9°22.5′	35°09.38′	370.34	37.84	722.25	149.32	737.53	510.23	259.33
760	9°30.0′	36°06.00′	375.03	39.34	730.38	155.15	746.68	517.62	263.32
770	9°37.5′	37°03.38′	379.69	40.89	738.41	161.11	755.78	525.05	267.35
780	9°45.0′	38°01.50′	384.34	42.47	746.34	167.20	764.84	532.53	271.42
790	9°52.5′	39°00.38′	388.98	44.08	754.16	173.43	773.85	540.05	275.54
800	10°00.0′	40°00.00′	393.59	45.74	761.88	179.79	782.80	547.62	279.70
810	10°07.5′	41°00.38′	398.18	47.44	769.48	186.28	791.71	555.24	283.90
820	10°15.0′	42°01.50′	402.76	49.17	776.97	192.91	800.56	562.91	288.16
830	10°22.5′	43°03.38′	407.31	50.94	784.34	199.67	809.35	570.64	292.46
840	10°30.0′	44°06.00′	411.84	52.75	791.58	206.56	818.09	578.43	296.82
850	10°37.5′	45°09.38′	416.35	54.60	798.70	213.59	826.77	586.27	301.24
860	10°45.0′	46°13.50′	420.84	56.49	805.68	220.74	835.38	594.18	305.71
870	10°52.5′	47°18.38′	425.30	58.42	812.53	228.03	843.93	602.16	310.25
880	11°00.0′	48°24.00′	429.74	60.39	819.25	235.44	852.41	610.21	314.85
890	11°07.5′	49°30.38′	434.15	62.40	825.81	242.98	860.82	618.33	319.52
900	11°15.0′	50°37.50′	438.54	64.45	832.23	250.65	869.16	626.53	324.25
910	11°22.5′	51°45.38′	442.90	66.54	838.50	258.44	877.42	634.80	329.07
920	11°30.0′	52°54.00′	447.23	68.67	844.61	266.36	885.61	643.16	333.96
930	11°37.5′	54°03.38′	451.54	70.84	850.56	274.40	893.73	651.61	338.93
940	11°45.0′	55°13.50′	455.82	73.05	856.35	282.55	901.76	660.15	343.99
950	11°52.5′	56°24.38′	460.06	75.29	861.97	290.82	909.71	668.79	349.13
960	12°00.0′	57°36.00′	464.28	77.58	867.41	299.21	917.57	677.53	354.38
970	12°07.5′	58°48.38′	468.46	79.91	872.68	307.71	925.34	686.37	359.72
980	12°15.0′	60°01.50′	472.61	82.28	877.77	316.32	933.03	695.33	365.16
990	12°22.5′	61°15.38′	476.73	84.69	882.67	325.03	940.62	704.40	370.71
1000	12°30.0′	62°30.00′	480.81	87.14	887.39	333.85	948.11	713.59	376.38

TABLE V, THE STANDARD HIGHWAY SPIRAL

$a = 1\frac{1}{3}$

L	D	S	q	p	X	Y	C	U	V
10	0°08.0′	0°00.40′	5.00	0.00	10.00	0.00	10.00	6.67	3.33
20	0°16.0′	0°01.60′	10.00	0.00	20.00	0.00	20.00	13.33	6.67
30	0°24.0′	0°03.60′	15.00	0.00	30.00	0.01	30.00	20.00	10.00
40	0°32.0′	0°06.40′	20.00	0.01	40.00	0.02	40.00	26.67	13.33
50	0°40.0′	0°10.00′	25.00	0.01	50.00	0.05	50.00	33.33	16.67
60	0°48.0′	0°14.40′	30.00	0.02	60.00	0.08	60.00	40.00	20.00
70	0°56.0′	0°19.60′	35.00	0.03	70.00	0.13	70.00	46.67	23.33
80	1°04.0′	0°25.60′	40.00	0.05	80.00	0.20	80.00	53.33	26.67
90	1°12.0′	0°32.40′	45.00	0.07	90.00	0.28	90.00	60.00	30.00
100	1°20.0′	0°40.00′	50.00	0.10	100.00	0.39	100.00	66.67	33.33
110	1°28.0′	0°48.40′	55.00	0.13	110.00	0.52	110.00	73.33	36.67
120	1°36.0′	0°57.60′	60.00	0.17	120.00	0.67	120.00	80.00	40.00
130	1°44.0′	1°07.60′	65.00	0.21	129.99	0.85	130.00	86.67	43.33
140	1°52.0′	1°18.40′	70.00	0.27	139.99	1.06	140.00	93.34	46.67
150	2°00.0′	1°30.00′	75.00	0.33	149.99	1.31	150.00	100.00	50.00
160	2°08.0′	1°42.40′	80.00	0.40	159.99	1.59	159.99	106.67	53.34
170	2°16.0′	1°55.60′	85.00	0.48	169.98	1.91	169.99	113.34	56.67
180	2°24.0′	2°09.60′	90.00	0.57	179.97	2.26	179.99	120.01	60.01
190	2°32.0′	2°24.40′	94.99	0.67	189.97	2.66	189.99	126.68	63.34
200	2°40.0′	2°40.00′	99.99	0.78	199.96	3.10	199.98	133.35	66.68
210	2°48.0′	2°56.40′	104.99	0.90	209.94	3.59	209.98	140.02	70.02
220	2°56.0′	3°13.60′	109.99	1.03	219.93	4.13	219.97	146.69	73.36
230	3°04.0′	3°31.60′	114.99	1.18	229.91	4.72	229.96	153.36	76.69
240	3°12.0′	3°50.40′	119.98	1.34	239.89	5.36	239.95	160.04	80.03
250	3°20.0′	4°10.00′	124.98	1.51	249.87	6.06	249.94	166.71	83.38
260	3°28.0′	4°30.40′	129.97	1.70	259.84	6.81	259.93	173.39	86.72
270	3°36.0′	4°51.60′	134.97	1.91	269.81	7.63	269.91	180.07	90.06
280	3°44.0′	5°13.60′	139.96	2.13	279.77	8.51	279.90	186.75	93.41
290	3°52.0′	5°36.40′	144.95	2.36	289.72	9.45	289.88	193.43	96.75
300	4°00.0′	5°60.00′	149.95	2.62	299.67	10.46	299.85	200.12	100.10
310	4°08.0′	6°24.40′	154.94	2.89	309.61	11.54	309.83	206.80	103.46
320	4°16.0′	6°49.60′	159.92	3.18	319.55	12.70	319.80	213.49	106.81
330	4°24.0′	7°15.60′	164.91	3.48	329.47	13.92	329.76	220.19	110.17
340	4°32.0′	7°42.40′	169.90	3.81	339.39	15.22	339.73	226.88	113.53
350	4°40.0′	8°10.00′	174.88	4.15	349.29	16.60	349.68	233.58	116.89
360	4°48.0′	8°38.40′	179.86	4.52	359.18	18.07	359.64	240.29	120.26
370	4°56.0′	9°07.60′	184.84	4.91	369.06	19.61	369.58	247.00	123.63
380	5°04.0′	9°37.60′	189.82	5.32	378.93	21.24	379.52	253.71	127.01
390	5°12.0′	10°08.40′	194.80	5.75	388.78	22.96	389.46	260.43	130.39
400	5°20.0′	10°40.00′	199.77	6.20	398.62	24.76	399.38	267.15	133.78
410	5°28.0′	11°12.40′	204.74	6.67	408.43	26.66	409.30	273.88	137.17
420	5°36.0′	11°45.60′	209.71	7.17	418.23	28.65	419.21	280.62	140.56
430	5°44.0′	12°19.60′	214.67	7.70	428.01	30.73	429.12	287.36	143.97
440	5°52.0′	12°54.40′	219.63	8.24	437.77	32.92	439.01	294.12	147.38
450	6°00.0′	13°30.00′	224.58	8.82	447.51	35.20	448.89	300.88	150.80
460	6°08.0′	14°06.40′	229.54	9.42	457.22	37.59	458.76	307.65	154.22
470	6°16.0′	14°43.60′	234.48	10.04	466.90	40.08	468.62	314.42	157.66
480	6°24.0′	15°21.60′	239.43	10.70	476.56	42.67	478.47	321.21	161.10
490	6°32.0′	16°00.40′	244.36	11.38	486.19	45.38	488.30	328.01	164.56
500	6°40.0′	16°40.00′	249.30	12.08	495.79	48.19	498.12	334.82	168.02

TABLE V, THE STANDARD HIGHWAY SPIRAL

a = 1⅓—Continued

L	D	S	q	p	X	Y	C	U	V
510	6°48.0′	17°20.40′	254.22	12.82	505.35	51.11	507.93	341.65	171.50
520	6°56.0′	18°01.60′	259.14	13.59	514.88	54.15	517.72	348.48	174.98
530	7°04.0′	18°43.60′	264.06	14.38	524.37	57.30	527.49	355.33	178.48
540	7°12.0′	19°26.40′	268.97	15.21	533.82	60.57	537.24	362.20	182.00
550	7°20.0′	20°10.00′	273.87	16.06	543.23	63.96	546.98	369.07	185.52
560	7°28.0′	20°54.40′	278.76	16.95	552.59	67.47	556.69	375.97	189.07
570	7°36.0′	21°39.60′	283.65	17.87	561.91	71.10	566.39	382.88	192.62
580	7°44.0′	22°25.60′	288.53	18.82	571.18	74.85	576.06	389.82	196.20
590	7°52.0′	23°12.40′	293.39	19.80	580.39	78.73	585.71	396.77	199.79
600	8°00.0′	23°60.00′	298.25	20.81	589.56	82.73	595.33	403.74	203.40
610	8°08.0′	24°48.40′	303.10	21.86	598.66	86.86	604.93	410.73	207.03
620	8°16.0′	25°37.60′	307.94	22.94	607.71	91.12	614.51	417.75	210.69
630	8°24.0′	26°27.60′	312.77	24.06	616.70	95.51	624.05	424.79	214.36
640	8°32.0′	27°18.40′	317.59	25.21	625.62	100.03	633.56	431.86	218.06
650	8°40.0′	28°10.00′	322.40	26.40	634.47	104.69	643.05	438.95	221.78
660	8°48.0′	29°02.40′	327.19	27.62	643.25	109.48	652.50	446.07	225.53
670	8°56.0′	29°55.60′	331.98	28.88	651.95	114.40	661.91	453.22	229.30
680	9°04.0′	30°49.60′	336.75	30.17	660.58	119.45	671.29	460.40	233.11
690	9°12.0′	31°44.40′	341.50	31.51	669.12	124.65	680.63	467.62	236.94
700	9°20.0′	32°40.00′	346.24	32.87	677.59	129.98	689.94	474.87	240.81
710	9°28.0′	33°36.39′	350.97	34.28	685.96	135.44	699.20	482.15	244.71
720	9°36.0′	34°33.59′	355.68	35.72	694.24	141.05	708.42	489.48	248.64
730	9°44.0′	35°31.59′	360.37	37.21	702.43	146.79	717.60	496.84	252.61
740	9°52.0′	36°30.39′	365.05	38.73	710.52	152.67	726.73	504.25	256.62
750	10°00.0′	37°29.99′	369.71	40.29	718.50	158.69	735.82	511.70	260.67
760	10°08.0′	38°30.39′	374.35	41.88	726.38	164.84	744.85	519.20	264.76
770	10°16.0′	39°31.59′	378.97	43.52	734.15	171.14	753.84	526.74	268.90
780	10°24.0′	40°33.59′	383.58	45.20	741.81	177.57	762.77	534.34	273.08
790	10°32.0′	41°36.39′	388.16	46.92	749.35	184.14	771.64	541.99	277.32
800	10°40.0′	42°39.99′	392.72	48.67	756.76	190.85	780.46	549.70	281.60
810	10°48.0′	43°44.39′	397.26	50.47	764.05	197.70	789.21	557.46	285.94
820	10°56.0′	44°49.59′	401.78	52.31	771.21	204.68	797.91	565.29	290.34
830	11°04.0′	45°55.59′	406.27	54.19	778.23	211.80	806.54	573.18	294.80
840	11°12.0′	47°02.39′	410.74	56.11	785.12	219.05	815.10	581.14	299.31
850	11°20.0′	48°09.99′	415.18	58.07	791.86	226.43	823.60	589.17	303.90
860	11°28.0′	49°18.39′	419.60	60.07	798.46	233.95	832.03	597.28	308.55
870	11°36.0′	50°27.59′	423.99	62.11	804.90	241.60	840.38	605.46	313.28
880	11°44.0′	51°37.59′	428.36	64.19	811.19	249.37	848.65	613.73	318.08
890	11°52.0′	52°48.39′	432.69	66.32	817.32	257.27	856.85	622.08	322.97
900	12°00.0′	53°59.99′	437.00	68.48	823.28	265.30	864.97	630.52	327.93
910	12°08.0′	55°12.39′	441.28	70.69	829.07	273.45	873.00	639.06	332.99
920	12°16.0′	56°25.59′	445.52	72.94	834.69	281.73	880.95	647.70	338.13
930	12°24.0′	57°39.59′	449.74	75.23	840.13	290.12	888.81	656.44	343.38
940	12°32.0′	58°54.39′	453.92	77.56	845.39	298.62	896.58	665.29	348.73
950	12°40.0′	60°09.99′	458.07	79.93	850.46	307.24	904.25	674.26	354.18
960	12°48.0′	61°26.39′	462.18	82.35	855.33	315.97	911.83	683.35	359.75
970	12°56.0′	62°43.59′	466.26	84.80	860.02	324.81	919.31	692.56	365.43
980	13°04.0′	64°01.59′	470.30	87.30	864.50	333.75	926.68	701.91	371.24
990	13°12.0′	65°20.39′	474.30	89.83	868.77	342.79	933.95	711.40	377.19
1000	13°20.0′	66°39.99′	478.27	92.41	872.84	351.92	941.12	721.04	383.27

TABLE V, THE STANDARD HIGHWAY SPIRAL

$a = 1.5$

L	D	S	q	p	X	Y	C	U	V
10	0°09.0′	0°00.45′	5.00	0.00	10.00	0.00	10.00	6.67	3.33
20	0°18.0′	0°01.80′	10.00	0.00	20.00	0.00	20.00	13.33	6.67
30	0°27.0′	0°04.05′	15.00	0.00	30.00	0.01	30.00	20.00	10.00
40	0°36.0′	0°07.20′	20.00	0.01	40.00	0.03	40.00	26.67	13.33
50	0°45.0′	0°11.25′	25.00	0.01	50.00	0.05	50.00	33.33	16.67
60	0°54.0′	0°16.20′	30.00	0.02	60.00	0.09	60.00	40.00	20.00
70	1°03.0′	0°22.05′	35.00	0.04	70.00	0.15	70.00	46.67	23.33
80	1°12.0′	0°28.80′	40.00	0.06	80.00	0.22	80.00	53.33	26.67
90	1°21.0′	0°36.45′	45.00	0.08	90.00	0.32	90.00	60.00	30.00
100	1°30.0′	0°45.00′	50.00	0.11	100.00	0.44	100.00	66.67	33.33
110	1°39.0′	0°54.45′	55.00	0.15	110.00	0.58	110.00	73.33	36.67
120	1°48.0′	1°04.80′	60.00	0.19	120.00	0.75	120.00	80.00	40.00
130	1°57.0′	1°16.05′	65.00	0.24	129.99	0.96	130.00	86.67	43.34
140	2°06.0′	1°28.20′	70.00	0.30	139.99	1.20	140.00	93.34	46.67
150	2°15.0′	1°41.25′	75.00	0.37	149.99	1.47	149.99	100.00	50.00
160	2°24.0′	1°55.20′	80.00	0.45	159.98	1.79	159.99	106.67	43.34
170	2°33.0′	2°10.05′	85.00	0.54	169.98	2.14	169.99	113.34	56.67
180	2°42.0′	2°25.80′	89.99	0.64	179.97	2.54	179.99	120.01	60.01
190	2°51.0′	2°42.45′	94.99	0.75	189.96	2.99	189.98	126.68	63.35
200	3°00.0′	3°00.00′	99.99	0.87	199.95	3.49	199.98	133.35	66.68
210	3°09.0′	3°18.45′	104.99	1.01	209.93	4.04	209.97	140.02	70.02
220	3°18.0′	3°37.80′	109.99	1.16	219.91	4.64	219.96	146.70	73.36
230	3°27.0′	3°58.05′	114.98	1.33	229.89	5.31	229.95	153.37	76.70
240	3°36.0′	4°19.20′	119.98	1.51	239.86	6.03	239.94	160.05	80.04
250	3°45.0′	4°41.25′	124.97	1.70	249.83	6.81	249.93	166.73	83.39
260	3°54.0′	5°04.20′	129.97	1.92	259.80	7.66	259.91	173.40	86.73
270	4°03.0′	5°28.05′	134.96	2.15	269.75	8.58	269.89	180.09	90.08
280	4°12.0′	5°52.80′	139.95	2.39	279.71	9.57	279.87	186.77	93.43
290	4°21.0′	6°18.45′	144.94	2.66	289.65	10.63	289.84	193.46	96.78
300	4°30.0′	6°45.00′	149.93	2.94	299.58	11.77	299.81	200.15	100.13
310	4°39.0′	7°12.45′	154.92	3.25	309.51	12.98	309.78	206.84	103.49
320	4°48.0′	7°40.80′	159.90	3.57	319.43	14.28	319.74	213.53	106.85
330	4°57.0′	8°10.05′	164.89	3.92	329.33	15.66	329.70	220.23	110.21
340	5°06.0′	8°40.20′	169.87	4.28	339.22	17.12	339.65	226.94	113.58
350	5°15.0′	9°11.25′	174.85	4.67	349.10	18.67	349.60	233.65	116.95
360	5°24.0′	9°43.20′	179.83	5.08	358.97	20.32	359.54	240.36	120.33
370	5°33.0′	10°16.05′	184.80	5.52	368.81	22.05	369.47	247.08	123.71
380	5°42.0′	10°49.80′	189.77	5.98	378.64	23.88	379.40	253.81	127.10
390	5°51.0′	11°24.45′	194.74	6.46	388.46	25.81	389.31	260.54	130.49
400	6°00.0′	12°00.00′	199.71	6.97	398.25	27.84	399.22	267.28	133.89
410	6°09.0′	12°36.45′	204.67	7.51	408.02	29.97	409.12	274.03	137.30
420	6°18.0′	13°13.80′	209.63	8.07	417.77	32.20	419.01	280.79	140.71
430	6°27.0′	13°52.05′	214.58	8.65	427.49	34.55	428.88	287.55	144.14
440	6°36.0′	14°31.20′	219.53	9.27	437.18	37.00	438.75	294.33	147.57
450	6°45.0′	15°11.25′	224.47	9.92	446.85	39.56	448.60	301.11	151.01
460	6°54.0′	15°52.20′	229.41	10.59	456.48	42.24	458.43	307.91	154.46
470	7°03.0′	16°34.05′	234.35	11.29	466.09	45.03	468.26	314.72	157.93
480	7°12.0′	17°16.80′	239.27	12.02	475.65	47.94	478.06	321.54	161.40
490	7°21.0′	18°00.45′	244.20	12.79	485.18	50.97	487.85	328.37	164.89
500	7°30.0′	18°45.00′	249.11	13.58	494.67	54.13	497.62	335.22	168.39

TABLE V, THE STANDARD HIGHWAY SPIRAL

a = 1.5—Continued

L	D	S	q	p	X	Y	C	U	V
510	7°39.0′	19°30.45′	254.02	14.41	504.12	57.40	507.38	342.09	171.90
520	7°48.0′	20°16.80′	258.92	15.27	513.52	60.80	517.11	348.97	175.43
530	7°57.0′	21°04.05′	263.81	16.16	522.88	64.34	526.82	355.87	178.97
540	8°06.0′	21°52.20′	268.69	17.09	532.19	67.99	536.51	362.79	182.54
550	8°15.0′	22°41.25′	273.57	18.05	541.44	71.79	546.18	369.72	186.12
560	8°24.0′	23°31.20′	278.43	19.04	550.64	75.71	555.82	376.68	189.72
570	8°33.0′	24°22.05′	283.29	20.07	559.78	79.77	565.43	383.66	193.34
580	8°42.0′	25°13.80′	288.14	21.14	568.85	83.96	575.02	390.67	196.98
590	8°51.0′	26°06.45′	292.97	22.24	577.87	88.29	584.57	397.70	200.64
600	9°00.0′	27°00.00′	297.79	23.38	586.81	92.76	594.10	404.75	204.33
610	9°09.0′	27°54.45′	302.60	24.55	595.69	97.37	603.59	411.84	208.04
620	9°18.0′	28°49.80′	307.40	25.76	604.49	102.12	613.05	418.95	211.78
630	9°27.0′	29°46.05′	312.19	27.01	613.21	107.02	622.47	426.10	215.55
640	9°36.0′	30°43.20′	316.96	28.30	621.84	112.05	631.86	433.27	219.35
650	9°45.0′	31°41.25′	321.71	29.63	630.40	117.24	641.21	440.49	223.18
660	9°54.0′	32°40.20′	326.46	31.00	638.86	122.56	650.51	447.73	227.05
670	10°03.0′	33°40.05′	331.18	32.41	647.23	128.03	659.77	455.02	230.95
680	10°12.0′	34°40.80′	335.89	33.85	655.51	133.65	668.99	462.35	234.89
690	10°21.0′	35°42.45′	340.58	35.34	663.68	139.41	678.16	469.72	238.86
700	10°30.0′	36°45.00′	345.25	36.87	671.74	145.32	687.28	477.14	242.88
710	10°39.0′	37°48.45′	349.91	38.44	679.70	151.38	696.35	484.60	246.94
720	10°48.0′	38°52.80′	354.54	40.05	687.55	157.58	705.37	492.11	251.05
730	10°57.0′	39°58.05′	359.16	41.71	695.27	163.93	714.33	499.68	255.20
740	11°06.0′	41°04.20′	363.76	43.40	702.87	170.43	723.24	507.30	259.41
750	11°15.0′	42°11.25′	368.32	45.14	710.35	177.07	732.08	514.98	263.67
760	11°24.0′	43°19.20′	372.87	46.92	717.69	183.86	740.87	522.72	267.99
770	11°33.0′	44°28.05′	377.40	48.74	724.90	190.79	749.58	530.52	272.36
780	11°42.0′	45°37.80′	381.90	50.61	731.96	197.87	758.23	538.40	276.80
790	11°51.0′	46°48.45′	386.37	52.52	738.88	205.09	766.81	546.34	281.31
800	12°00.0′	48°00.00′	390.82	54.47	745.65	212.45	775.32	554.36	285.88
810	12°09.0′	49°12.45′	395.24	56.47	752.26	219.95	783.76	562.45	290.53
820	12°18.0′	50°25.80′	399.64	58.51	758.71	227.59	792.11	570.63	295.25
830	12°27.0′	51°40.05′	404.00	60.59	765.00	235.37	800.39	578.90	300.05
840	12°36.0′	52°55.20′	408.34	62.72	771.12	243.28	808.58	587.26	304.94
850	12°45.0′	54°11.25′	412.64	64.89	777.06	251.32	816.69	595.71	309.92
860	12°54.0′	55°28.20′	416.91	67.11	782.82	259.50	824.71	604.27	314.99
870	13°03.0′	56°46.05′	421.15	69.36	788.39	267.80	832.63	612.93	320.16
880	13°12.0′	58°04.80′	425.35	71.67	793.78	276.22	840.46	621.71	325.43
890	13°21.0′	59°24.45′	429.52	74.01	798.96	284.77	848.20	630.60	330.82
900	13°30.0′	60°45.00′	433.65	76.40	803.95	293.44	855.83	639.62	336.32
910	13°39.0′	62°06.45′	437.75	78.84	808.74	302.22	863.36	648.77	341.95
920	13°48.0′	63°28.80′	441.81	81.31	813.31	311.11	870.78	658.06	347.70
930	13°57.0′	64°52.05′	445.83	83.83	817.66	320.12	878.09	667.49	353.59
940	14°06.0′	66°16.20′	449.80	86.39	821.80	329.22	885.29	677.08	359.63
950	14°15.0′	67°41.25′	453.74	89.00	825.71	338.42	892.37	686.83	365.81
960	14°24.0′	69°07.20′	457.63	91.65	829.39	347.72	899.33	696.75	372.16
970	14°33.0′	70°34.05′	461.48	94.33	832.84	357.11	906.17	706.85	378.68
980	14°42.0′	72°01.80′	465.29	97.06	836.04	366.58	912.88	717.15	385.38
990	14°51.0′	73°30.45′	469.05	99.83	839.01	376.13	919.46	727.64	392.27
1000	15°00.0′	75°00.00′	472.76	102.64	841.72	385.76	925.90	738.36	399.36

TABLE V, THE STANDARD HIGHWAY SPIRAL

$a = 1.75$

L	D	S	q	p	X	Y	C	U	V
10	0°10.5′	0°00.53′	5.00	0.00	10.00	0.00	10.00	6.67	3.33
20	0°21.0′	0°02.10′	10.00	0.00	20.00	0.00	20.00	13.33	6.67
30	0°31.5′	0°04.73′	15.00	0.00	30.00	0.01	30.00	20.00	10.00
40	0°42.0′	0°08.40′	20.00	0.01	40.00	0.03	40.00	26.67	13.33
50	0°52.5′	0°13.13′	25.00	0.02	50.00	0.06	50.00	33.33	16.67
60	1°03.0′	0°18.90′	30.00	0.03	60.00	0.11	60.00	40.00	20.00
70	1°13.5′	0°25.73′	35.00	0.04	70.00	0.17	70.00	46.67	23.33
80	1°24.0′	0°33.60′	40.00	0.07	80.00	0.26	80.00	53.33	26.67
90	1°34.5′	0°42.53′	45.00	0.09	90.00	0.37	90.00	60.00	30.00
100	1°45.0′	0°52.50′	50.00	0.13	100.00	0.51	100.00	66.67	33.33
110	1°55.5′	1°03.53′	55.00	0.17	110.00	0.68	110.00	73.33	36.67
120	2°06.0′	1°15.60′	60.00	0.22	119.99	0.88	120.00	80.00	40.00
130	2°16.5′	1°28.73′	65.00	0.28	129.99	1.12	130.00	86.67	43.34
140	2°27.0′	1°42.90′	70.00	0.35	139.99	1.40	139.99	93.34	46.67
150	2°37.5′	1°58.13′	75.00	0.43	149.98	1.72	149.99	100.01	50.01
160	2°48.0′	2°14.40′	80.00	0.52	159.98	2.08	159.99	106.68	53.34
170	2°58.5′	2°31.73′	84.99	0.63	169.97	2.50	169.99	113.34	56.68
180	3°09.0′	2°50.10′	89.99	0.74	179.96	2.97	179.98	120.02	60.01
190	3°19.5′	3°09.53′	94.99	0.87	189.94	3.49	189.97	126.69	63.35
200	3°30.0′	3°30.00′	99.99	1.01	199.93	4.07	199.97	133.36	66.69
210	3°40.5′	3°51.53′	104.98	1.18	209.90	4.71	209.96	140.03	70.03
220	3°51.0′	4°14.10′	109.98	1.35	219.88	5.42	219.95	146.71	73.37
230	4°01.5′	4°37.73′	114.97	1.55	229.85	6.19	229.93	153.39	76.71
240	4°12.0′	5°02.40′	119.97	1.76	239.81	7.03	239.92	160.06	80.06
250	4°22.5′	5°28.13′	124.96	1.99	249.77	7.95	249.90	166.75	83.41
260	4°33.0′	5°54.90′	129.95	2.24	259.72	8.94	259.88	173.43	86.75
270	4°43.5′	6°22.73′	134.94	2.50	269.67	10.01	269.85	180.12	90.11
280	4°54.0′	6°51.60′	139.93	2.79	279.60	11.16	279.82	186.81	93.46
290	5°04.5′	7°21.53′	144.92	3.10	289.52	12.40	289.79	193.50	96.82
300	5°15.0′	7°52.50′	149.91	3.43	299.43	13.73	299.75	200.20	100.18
310	5°25.5′	8°24.53′	154.89	3.79	309.33	15.14	309.70	206.90	103.55
320	5°36.0′	8°57.60′	159.87	4.17	319.22	16.65	319.65	213.61	106.92
330	5°46.5′	9°31.73′	164.85	4.57	329.09	18.26	329.59	220.32	110.29
340	5°57.0′	10°06.90′	169.82	5.00	338.94	19.96	339.53	227.04	113.67
350	6°07.5′	10°43.13′	174.80	5.45	348.78	21.77	349.46	233.76	117.06
360	6°18.0′	11°20.40′	179.77	5.93	358.59	23.68	359.37	240.49	120.45
370	6°28.5′	11°58.73′	184.73	6.44	368.39	25.70	369.28	247.23	123.85
380	6°39.0′	12°38.10′	189.69	6.97	378.16	27.84	379.18	253.98	127.26
390	6°49.5′	13°18.53′	194.65	7.53	387.90	30.08	389.07	260.74	130.67
400	7°00.0′	14°00.00′	199.60	8.13	397.62	32.44	398.94	267.51	134.10
410	7°10.5′	14°42.53′	204.55	8.75	407.31	34.92	408.80	274.28	137.53
420	7°21.0′	15°26.10′	209.49	9.40	416.96	37.52	418.65	281.07	140.97
430	7°31.5′	16°10.73′	214.43	10.09	426.58	40.24	428.48	287.87	144.43
440	7°42.0′	16°56.40′	219.36	10.81	436.17	43.09	438.29	294.69	147.90
450	7°52.5′	17°43.13′	224.28	11.56	445.72	46.07	448.09	301.52	151.38
460	8°03.0′	18°30.90′	229.20	12.34	455.22	49.18	457.87	308.36	154.87
470	8°13.5′	19°19.73′	234.11	13.16	464.68	52.42	467.63	315.22	158.38
480	8°24.0′	20°09.60′	239.01	14.01	474.09	55.80	477.36	322.10	161.91
490	8°34.5′	21°00.53′	243.91	14.90	483.45	59.32	487.08	329.00	165.45
500	8°45.0′	21°52.50′	248.79	15.83	492.76	62.97	496.77	335.91	169.02

TABLE V, THE STANDARD HIGHWAY SPIRAL

a = 1.75—Continued

L	D	S	q	p	X	Y	C	U	V
510	8°55.5′	22°45.53′	253.66	16.79	502.01	66.77	506.43	342.85	172.60
520	9°06.0′	23°39.60′	258.53	17.79	511.20	70.71	516.07	349.81	176.20
530	9°16.5′	24°34.73′	263.38	18.82	520.33	74.80	525.68	356.80	179.82
540	9°27.0′	25°30.90′	268.22	19.90	529.39	79.03	535.26	363.81	183.47
550	9°37.5′	26°28.13′	273.06	21.01	538.38	83.41	544.80	370.85	187.14
560	9°48.0′	27°26.40′	277.87	22.17	547.29	87.94	554.31	377.92	190.84
570	9°58.5′	28°25.73′	282.68	23.36	556.13	92.63	563.79	385.02	194.57
580	10°09.0′	29°26.10′	287.47	24.60	564.88	97.47	573.23	392.15	198.33
590	10°19.5′	30°27.53′	292.24	25.88	573.54	102.46	582.62	399.32	202.12
600	10°30.0′	31°30.00′	297.00	27.19	582.12	107.60	591.98	406.52	205.94
610	10°40.5′	32°33.53′	301.75	28.56	590.59	112.91	601.29	413.77	209.80
620	10°51.0′	33°38.10′	306.47	29.96	598.97	118.37	610.56	421.05	213.70
630	11°01.5′	34°43.73′	311.18	31.41	607.24	123.99	619.77	428.38	217.64
640	11°12.0′	35°50.40′	315.87	32.90	615.41	129.76	628.94	435.75	221.62
650	11°22.5′	36°58.13′	320.54	34.43	623.46	135.70	638.05	443.18	225.64
660	11°33.0′	38°06.90′	325.19	36.01	631.39	141.79	647.11	450.65	229.71
670	11°43.5′	39°16.73′	329.82	37.64	639.19	148.04	656.11	458.18	233.84
680	11°54.0′	40°27.60′	334.43	39.31	646.86	154.45	665.05	465.77	238.01
690	12°04.5′	41°39.53′	339.01	41.03	654.41	161.02	673.92	473.42	242.25
700	12°15.0′	42°52.50′	343.57	42.79	661.81	167.75	682.73	481.13	246.54
710	12°25.5′	44°06.53′	348.10	44.60	669.06	174.63	691.47	488.91	250.89
720	12°36.0′	45°21.60′	352.61	46.45	676.16	181.67	700.14	496.77	255.31
730	12°46.5′	46°37.73′	357.09	48.35	683.11	188.86	708.74	504.70	259.81
740	12°57.0′	47°54.90′	361.54	50.30	689.90	196.20	717.25	512.71	264.37
750	13°07.5′	49°13.13′	365.96	52.30	696.51	203.70	725.69	520.80	269.01
760	13°18.0′	50°32.40′	370.35	54.34	702.96	211.35	734.04	528.99	273.74
770	13°28.5′	51°52.73′	374.71	56.43	709.22	219.14	742.31	537.26	278.55
780	13°39.0′	53°14.10′	379.04	58.56	715.30	227.08	750.48	545.64	283.46
790	13°49.5′	54°36.53′	383.34	60.75	721.19	235.16	758.56	554.13	288.47
800	14°00.0′	56°00.00′	387.60	62.98	726.88	243.38	766.55	562.72	293.57
810	14°10.5′	57°24.53′	391.82	65.26	732.37	251.74	774.43	571.43	298.79
820	14°21.0′	58°50.10′	396.00	67.58	737.65	260.23	782.21	580.27	304.12
830	14°31.5′	60°16.73′	400.15	69.96	742.72	268.85	789.88	589.24	309.58
840	14°42.0′	61°44.40′	404.26	72.38	747.57	277.60	797.45	598.35	315.17
850	14°52.5′	63°13.13′	408.32	74.84	752.19	286.47	804.89	607.60	320.89
860	15°03.0′	64°42.90′	412.35	77.36	756.58	295.45	812.22	617.01	326.76
870	15°13.5′	66°13.73′	416.33	79.92	760.73	304.55	819.43	626.59	332.78
880	15°24.0′	67°45.60′	420.27	82.52	764.64	313.75	826.51	636.34	338.97
890	15°34.5′	69°18.53′	424.16	85.17	768.30	323.06	833.46	646.28	345.34
900	15°45.0′	70°52.50′	428.00	87.87	771.70	332.46	840.27	656.41	351.88
910	15°55.5′	72°27.53′	431.79	90.61	774.85	341.95	846.95	666.76	358.63
920	16°06.0′	74°03.60′	435.54	93.39	777.73	351.53	853.48	677.33	365.59
930	16°16.5′	75°40.73′	439.23	96.22	780.34	361.18	859.87	688.13	372.77
940	16°27.0′	77°18.90′	442.87	99.09	782.67	370.91	866.11	699.19	380.19
950	16°37.5′	78°58.13′	446.46	102.00	784.73	380.69	872.20	710.51	387.86
960	16°48.0′	80°38.40′	449.99	104.96	786.50	390.53	878.12	722.13	395.80
970	16°58.5′	82°19.73′	453.47	107.95	787.98	400.42	883.89	734.05	404.04
980	17°09.0′	84°02.10′	456.89	110.99	789.17	410.35	889.48	746.29	412.59
990	17°19.5′	85°45.53′	460.25	114.06	790.06	420.31	894.90	758.89	421.47
1000	17°30.0′	87°30.00′	463.55	117.17	790.65	430.30	900.15	771.86	430.71

TABLE V, THE STANDARD HIGHWAY SPIRAL

$a = 2.0$

L	D	S	q	p	X	Y	C	U	V
10	0°12′	0°00.60′	5.00	0.00	10.00	0.00	10.00	6.67	3.33
20	0°24′	0°02.40′	10.00	0.00	20.00	0.00	20.00	13.33	6.67
30	0°36′	0°05.40′	15.00	0.00	30.00	0.02	30.00	20.00	10.00
40	0°48′	0°09.60′	20.00	0.01	40.00	0.04	40.00	26.67	13.33
50	1°00′	0°15.00′	25.00	0.02	50.00	0.07	50.00	33.33	16.67
60	1°12′	0°21.60′	30.00	0.03	60.00	0.13	60.00	40.00	20.00
70	1°24′	0°29.40′	35.00	0.05	70.00	0.20	70.00	46.67	23.33
80	1°36′	0°38.40′	40.00	0.07	80.00	0.30	80.00	53.33	26.67
90	1°48′	0°48.60′	45.00	0.11	90.00	0.42	90.00	60.00	30.00
100	2°00′	1°00.00′	50.00	0.15	100.00	0.58	100.00	66.67	33.33
110	2°12′	1°12.60′	55.00	0.19	110.00	0.77	110.00	73.34	36.67
120	2°24′	1°26.40′	60.00	0.25	119.99	1.01	120.00	80.00	40.00
130	2°36′	1°41.40′	65.00	0.32	129.99	1.28	129.99	86.67	43.34
140	2°48′	1°57.60′	70.00	0.40	139.98	1.60	139.99	93.34	46.67
150	3°00′	2°15.00′	75.00	0.49	149.98	1.96	149.99	100.01	50.01
160	3°12′	2°33.60′	79.99	0.60	159.97	2.38	159.99	106.68	53.34
170	3°24′	2°53.40′	84.99	0.71	169.96	2.86	169.98	113.35	56.68
180	3°36′	3°14.40′	89.99	0.85	179.94	3.39	179.97	120.02	60.02
190	3°48′	3°36.60′	94.99	1.00	189.92	3.99	189.97	126.69	63.36
200	4°00′	4°00.00′	99.98	1.16	199.90	4.65	199.96	133.37	66.70
210	4°12′	4°24.60′	104.98	1.35	209.88	5.39	209.94	140.04	70.04
220	4°24′	4°50.40′	109.97	1.55	219.84	6.19	219.93	146.72	73.38
230	4°36′	5°17.40′	114.97	1.77	229.80	7.07	229.91	153.40	76.73
240	4°48′	5°45.60′	119.96	2.01	239.76	8.04	239.89	160.08	80.08
250	5°00′	6°15.00′	124.95	2.27	249.70	9.08	249.87	166.77	83.43
260	5°12′	6°45.60′	129.94	2.56	259.64	10.22	259.84	173.46	86.78
270	5°24′	7°17.40′	134.93	2.86	269.56	11.44	269.81	180.15	90.14
280	5°36′	7°50.40′	139.91	3.19	279.48	12.75	279.77	186.85	93.50
290	5°48′	8°24.60′	144.90	3.54	289.38	14.17	289.72	193.55	96.87
300	6°00′	9°00.00′	149.88	3.92	299.26	15.68	299.67	200.26	100.24
310	6°12′	9°36.60′	154.85	4.33	309.13	17.30	309.61	206.97	103.61
320	6°24′	10°14.40′	159.83	4.76	318.98	19.02	319.55	213.69	106.99
330	6°36′	10°53.40′	164.80	5.22	328.81	20.85	329.47	220.42	110.38
340	6°48′	11°33.60′	169.77	5.71	338.62	22.80	339.39	227.15	113.77
350	7°00′	12°15.00′	174.73	6.23	348.40	24.86	349.29	233.89	117.18
360	7°12′	12°57.60′	179.69	6.77	358.16	27.04	359.18	240.65	120.59
370	7°24′	13°41.40′	184.65	7.35	367.89	29.35	369.06	247.41	124.01
380	7°36′	14°26.40′	189.60	7.96	377.59	31.78	378.93	254.18	127.44
390	7°48′	15°12.60′	194.54	8.61	387.26	34.34	388.78	260.97	130.88
400	8°00′	16°00.00′	199.48	9.28	396.89	37.03	398.62	267.76	134.33
410	8°12′	16°48.60′	204.41	9.99	406.48	39.85	408.43	274.58	137.80
420	8°24′	17°38.40′	209.34	10.74	416.04	42.81	418.23	281.40	141.28
430	8°36′	18°29.40′	214.26	11.52	425.54	45.91	428.01	288.25	144.77
440	8°48′	19°21.60′	219.1[illegible]	12.34	435.00	49.16	437.77	295.11	148.28
450	9°00′	20°15.00′	224.07	13.19	444.41	52.54	447.51	301.99	151.81
460	9°12′	21°09.60′	228.96	14.09	453.77	56.08	457.22	308.89	155.35
470	9°24′	22°05.40′	233.84	15.02	463.06	59.76	466.90	315.81	158.92
480	9°36′	23°02.40′	238.71	15.99	472.30	63.60	476.56	322.75	162.51
490	9°48′	24°00.60′	243.57	17.00	481.46	67.59	486.19	329.72	166.12
500	10°00′	25°00.00′	248.42	18.06	490.56	71.74	495.78	336.72	169.75

TABLE V, THE STANDARD HIGHWAY SPIRAL

a = 2.0—Continued

L	D	S	q	p	X	Y	C	U	V
510	10°12′	26°00.60′	253.26	19.15	499.59	76.04	505.34	343.74	173.41
520	10°24′	27°02.40′	258.08	20.29	508.54	80.51	514.87	350.80	177.10
530	10°36′	28°05.40′	262.89	21.47	517.40	85.14	524.36	357.89	180.81
540	10°48′	29°09.60′	267.69	22.69	526.18	89.93	533.81	365.01	184.56
550	11°00′	30°15.00′	272.46	23.96	534.87	94.88	543.22	372.17	188.34
560	11°12′	31°21.60′	277.23	25.27	543.45	100.00	552.58	379.36	192.16
570	11°24′	32°29.40′	281.97	26.63	551.94	105.29	561.90	386.60	196.02
580	11°36′	33°38.40′	286.70	28.03	560.32	110.75	571.16	393.89	199.91
590	11°48′	34°48.60′	291.41	29.48	568.59	116.37	580.38	401.22	203.85
600	12°00′	36°00.00′	296.10	30.98	576.74	122.16	589.54	408.60	207.84
610	12°12′	37°12.60′	300.76	32.52	584.77	128.13	598.64	416.03	211.87
620	12°24′	38°26.40′	305.41	34.11	592.67	134.26	607.69	423.52	215.96
630	12°36′	39°41.40′	310.03	35.75	600.43	140.56	616.67	431.07	220.10
640	12°48′	40°57.60′	314.63	37.44	608.06	147.03	625.58	438.68	224.29
650	13°00′	42°15.00′	319.20	39.18	615.53	153.67	634.43	446.36	228.55
660	13°12′	43°33.60′	323.74	40.96	622.86	160.48	643.20	454.10	232.88
670	13°24′	44°53.40′	328.26	42.80	630.03	167.45	651.90	461.93	237.27
680	13°36′	46°14.40′	332.75	44.68	637.03	174.59	660.52	469.83	241.74
690	13°48′	47°36.60′	337.21	46.62	643.86	181.90	669.06	477.82	246.28
700	14°00′	49°00.00′	341.64	48.60	650.51	189.36	677.51	485.90	250.91
710	14°12′	50°24.60′	346.03	50.64	656.97	196.99	685.87	494.07	255.62
720	14°24′	51°50.40′	350.40	52.73	663.25	204.78	694.14	502.34	260.43
730	14°36′	53°17.40′	354.72	54.86	669.33	212.72	702.32	510.72	265.34
740	14°48′	54°45.60′	359.02	57.05	675.20	220.81	710.39	519.21	270.35
750	15°00′	56°15.00′	363.27	59.29	680.87	229.05	718.36	527.82	275.48
760	15°12′	57°45.60′	367.48	61.58	686.31	237.44	726.22	536.56	280.72
770	15°24′	59°17.40′	371.66	63.92	691.53	245.96	733.97	545.43	286.08
780	15°36′	60°50.40′	375.79	66.31	696.52	254.63	741.61	554.45	291.58
790	15°48′	62°24.60′	379.88	68.75	701.28	263.43	749.12	563.62	297.23
800	16°00′	64°00.00′	383.93	71.24	705.79	272.35	756.51	572.95	303.02
810	16°12′	65°36.60′	387.93	73.77	710.04	281.40	763.77	582.45	308.98
820	16°24′	67°14.40′	391.88	76.36	714.04	290.57	770.90	592.14	315.10
830	16°36′	68°53.40′	395.79	79.00	717.78	299.84	777.89	602.02	321.41
840	16°48′	70°33.60′	399.64	81.68	721.24	309.22	784.74	612.11	327.92
950	17°00′	72°15.00′	403.44	84.42	724.43	318.70	791.44	622.42	334.63
860	17°12′	73°57.60′	407.19	87.20	727.34	328.27	797.99	632.96	341.57
870	17°24′	75°41.40′	410.89	90.02	729.96	337.92	804.38	643.76	348.74
880	17°36′	77°26.40′	414.53	92.89	732.28	347.64	810.61	654.83	356.17
890	17°48′	79°12.60′	418.11	95.81	734.30	357.44	816.68	666.18	363.87
900	18°00′	81°00.00′	421.63	98.77	736.02	367.29	822.58	677.85	371.87
910	18°12′	82°48.60′	425.09	101.78	737.43	377.19	828.30	689.85	380.18
920	18°24′	84°38.40′	428.50	104.83	738.52	387.13	833.84	702.20	388.83
930	18°36′	86°29.40′	431.83	107.91	739.30	397.10	839.19	714.94	397.84
940	18°48′	88°21.60′	435.11	111.04	739.75	407.09	844.36	728.09	407.25
950	19°00′	90°15.00′	438.32	114.21	739.87	417.09	849.33	741.69	417.09
960	19°12′	92°09.60′	441.46	117.42	739.66	427.08	854.10	755.77	427.39
970	19°24′	94°05.40′	444.53	120.66	739.11	437.07	858.67	770.37	438.18
980	19°36′	96°02.40′	447.53	123.94	738.23	447.03	863.03	785.53	449.52
990	19°48′	98°00.60′	450.46	127.26	737.01	456.95	867.17	801.31	461.45
1000	20°00′	100°00.00′	453.32	130.60	735.44	466.83	871.10	817.76	474.03

TABLE V, THE STANDARD HIGHWAY SPIRAL

$a = 2.5$

L	D	S	q	p	X	Y	C	U	V
10	0°15′	0°00.75′	5.00	0.00	10.00	0.00	10.00	6.67	3.33
20	0°30′	0°03.00′	10.00	0.00	20.00	0.01	20.00	13.33	6.67
30	0°45′	0°06.75′	15.00	0.00	30.00	0.02	30.00	20.00	10.00
40	1°00′	0°12.00′	20.00	0.01	40.00	0.05	40.00	26.67	13.33
50	1°15′	0°18.75′	25.00	0.02	50.00	0.09	50.00	33.33	16.67
60	1°30′	0°27.00′	30.00	0.04	60.00	0.16	60.00	40.00	20.00
70	1°45′	0°36.75′	35.00	0.06	70.00	0.25	70.00	46.67	23.33
80	2°00′	0°48.00′	40.00	0.09	80.00	0.37	80.00	53.33	26.67
90	2°15′	1°00.75′	45.00	0.13	90.00	0.53	90.00	60.00	30.00
100	2°30′	1°15.00′	50.00	0.18	100.00	0.73	100.00	66.67	33.33
110	2°45′	1°30.75′	55.00	0.24	109.99	0.97	110.00	73.34	36.67
120	3°00′	1°48.00′	60.00	0.31	119.99	1.26	119.99	80.00	40.00
130	3°15′	2°06.75′	65.00	0.40	129.98	1.60	129.99	86.67	43.34
140	3°30′	2°27.00′	70.00	0.50	139.97	2.00	139.99	93.34	46.67
150	3°45′	2°48.75′	74.99	0.61	149.96	2.45	149.98	100.01	50.01
160	4°00′	3°12.00′	79.99	0.74	159.95	2.98	159.98	106.68	53.35
170	4°15′	3°36.75′	84.99	0.89	169.93	3.57	169.97	113.36	56.69
180	4°30′	4°03.00′	89.99	1.06	179.91	4.24	179.96	120.03	60.03
190	4°45′	4°30.75′	94.98	1.25	189.88	4.99	189.95	126.71	63.37
200	5°00′	5°00.00′	99.97	1.45	199.85	5.81	199.93	133.39	66.72
210	5°15′	5°30.75′	104.97	1.68	209.81	6.73	209.91	140.07	70.06
220	5°30′	6°03.00′	109.96	1.94	219.75	7.74	219.89	146.75	73.41
230	5°45′	6°36.75′	114.95	2.21	229.69	8.84	229.86	153.44	76.76
240	6°00′	7°12.00′	119.94	2.51	239.62	10.04	239.83	160.13	80.12
250	6°15′	7°48.75′	124.92	2.84	249.54	11.35	249.79	166.83	83.48
260	6°30′	8°27.00′	129.91	3.19	259.44	12.76	259.75	173.53	86.85
270	6°45′	9°06.75′	134.89	3.58	269.32	14.29	269.70	180.24	90.22
280	7°00′	9°48.00′	139.86	3.99	279.18	15.93	279.64	186.95	93.59
290	7°15′	10°30.75′	144.84	4.43	289.03	17.69	289.57	193.68	96.98
300	7°30′	11°15.00′	149.81	4.90	298.85	19.58	299.49	200.41	100.37
310	7°45′	12°00.75′	154.77	5.41	308.64	21.60	309.39	207.14	103.77
320	8°00′	12°48.00′	159.73	5.95	318.41	23.74	319.29	213.89	107.18
330	8°15′	13°36.75′	164.69	6.52	328.14	26.03	329.17	220.65	110.59
340	8°30′	14°27.00′	169.64	7.13	337.84	28.45	339.04	227.43	114.02
350	8°45′	15°18.75′	174.58	7.78	347.51	31.02	348.89	234.21	117.47
360	9°00′	16°12.00′	179.52	8.46	357.13	33.74	358.72	241.01	120.92
370	9°15′	17°06.75′	184.45	9.18	366.71	36.60	368.54	247.83	124.39
380	9°30′	18°03.00′	189.37	9.94	376.25	39.62	378.33	254.66	127.88
390	9°45′	19°00.75′	194.29	10.74	385.73	42.80	388.09	261.52	131.38
400	10°00′	20°00.00′	199.19	11.59	395.15	46.14	397.84	268.39	134.90
410	10°15′	21°00.75′	204.08	12.47	404.52	49.64	407.55	275.28	138.44
420	10°30′	22°03.00′	208.97	13.40	413.82	53.31	417.24	282.20	142.01
430	10°45′	23°06.75′	213.84	14.37	423.06	57.15	426.90	289.15	145.59
440	11°00′	24°12.00′	218.70	15.39	432.22	61.16	43.652	296.12	149.21
450	11°15′	25°18.75′	223.54	16.45	441.30	65.35	446.11	303.13	152.85
460	11°30′	26°27.00′	228.38	17.56	450.29	69.71	455.66	310.16	156.52
470	11°45′	27°36.75′	233.19	18.72	459.20	74.26	465.17	317.23	160.22
480	12°00′	28°48.00′	237.99	19.93	468.01	78.98	474.63	324.34	163.95
490	12°15′	30°00.75′	242.78	21.18	476.72	83.89	484.05	331.49	167.73
500	12°30′	31°15.00′	247.54	22.49	485.33	88.99	493.42	338.68	171.54

TABLE V, THE STANDARD HIGHWAY SPIRAL

a = 2.5—Continued

L	D	S	q	p	X	Y	C	U	V
510	12°45′	32°30.75′	252.29	23.84	493.82	94.27	502.74	345.92	175.39
520	13°00′	33°48.00′	257.01	25.25	502.19	99.74	512.00	353.20	179.29
530	13°15′	35°06.75′	261.72	26.71	510.44	105.40	521.21	360.54	183.24
540	13°30′	36°27.00′	266.40	28.22	518.55	111.24	530.35	367.94	187.24
550	13°45′	37°48.75′	271.06	29.78	526.52	117.28	539.43	375.40	191.30
560	14°00′	39°12.00′	275.69	31.40	534.35	123.50	548.44	382.92	195.41
570	14°15′	40°36.75′	280.29	33.07	542.02	129.92	557.37	390.51	199.59
580	14°30′	42°03.00′	284.87	34.80	549.53	136.52	566.23	398.17	203.83
590	14°45′	43°30.75′	289.42	36.58	556.87	143.31	575.01	405.91	208.15
600	15°00′	45°00.00′	293.94	38.42	564.03	150.29	583.71	413.74	212.55
610	15°15′	46°30.75′	298.42	40.31	571.01	157.46	592.32	421.65	217.02
620	15°30′	48°03.00′	302.87	42.26	577.79	164.80	600.84	429.66	221.59
630	15°45′	49°36.75′	307.29	44.26	584.38	172.33	609.26	437.78	226.25
640	16°00′	51°12.00′	311.67	46.32	590.75	180.04	617.57	446.00	231.01
650	16°15′	52°48.75′	316.01	48.44	596.90	187.92	625.79	454.33	235.88
660	16°30′	54°27.00′	320.31	60.61	602.83	195.97	633.89	462.79	240.86
670	16°45′	56°06.75′	324.57	52.84	608.53	204.19	641.87	471.39	245.97
680	17°00′	57°48.00′	328.79	55.13	613.98	212.57	649.74	480.12	251.21
690	17°15′	59°30.75′	332.96	57.48	619.18	221.11	657.48	489.01	256.58
700	17°30′	61°15.00′	337.08	59.87	624.13	229.80	665.09	498.05	262.11
710	17°45′	63°00.75′	341.16	62.33	628.80	238.64	672.56	507.27	267.80
720	18°00′	64°48.00′	345.18	64.84	633.20	247.62	679.90	516.68	273.67
730	18°15′	66°36.75′	349.16	67.41	637.31	256.74	687.08	526.28	279.72
740	18°30′	68°27.00′	353.08	70.03	641.14	265.98	694.12	536.10	285.97
750	18°45′	70°18.75′	356.94	72.70	644.66	275.33	700.99	546.14	292.43
760	19°00′	72°12.00′	360.75	75.43	647.87	284.80	707.71	556.43	299.12
770	19°15′	74°06.75′	364.50	78.21	650.77	294.37	714.25	566.98	306.07
780	19°30′	76°03.00′	368.19	81.05	653.34	304.04	720.62	577.82	313.28
790	19°45′	78°00.75′	371.81	83.93	655.59	313.78	726.81	588.96	320.78
800	20°00′	80°00.00′	375.37	86.86	657.50	323.60	732.81	600.44	328.59
810	20°15′	82°00.75′	378.86	89.85	659.06	333.47	738.62	612.27	336.74
820	20°30′	84°03.00′	382.29	92.88	660.27	343.40	744.23	624.48	345.26
830	20°45′	86°06.75′	385.64	95.96	661.13	353.36	749.64	637.12	354.18
840	21°00′	88°12.00′	388.92	99.08	661.63	363.35	754.83	650.21	363.53
850	21°15′	90°18.75′	392.13	102.25	661.76	373.35	759.81	663.79	373.35
860	21°30′	92°27.00′	395.27	105.46	661.52	383.34	764.56	677.92	383.69
870	21°45′	94°36.75′	398.33	108.71	660.90	393.32	769.09	692.63	394.60
880	22°00′	96°48.00′	401.30	112.00	659.91	403.27	773.37	707.99	406.13
890	22°15′	99°00.75′	404.20	115.33	658.53	413.18	777.42	724.07	418.34
900	22°30′	101°15.00′	407.02	118.69	656.77	423.02	781.22	740.92	431.31

TABLE V, THE STANDARD HIGHWAY SPIRAL

$a = 3.0$

L	D	S	q	p	x	y	C	U	V
10	0°18′	0°00.90′	5.00	0.00	10.00	0.00	10.00	6.67	3.33
20	0°36′	0°03.60′	10.00	0.00	20.00	0.01	20.00	13.33	6.67
30	0°54′	0°08.10′	15.00	0.01	30.00	0.02	30.00	20.00	10.00
40	1°12′	0°14.40′	20.00	0.01	40.00	0.06	40.00	26.67	13.33
50	1°30′	0°22.50′	25.00	0.03	50.00	0.11	50.00	33.33	16.67
60	1°48′	0°32.40′	30.00	0.05	60.00	0.19	60.00	40.00	20.00
70	2°06′	0°44.10′	35.00	0.07	70.00	0.30	70.00	46.67	23.33
80	2°24′	0°57.60′	40.00	0.11	80.00	0.45	80.00	53.33	26.67
90	2°42′	1°12.90′	45.00	0.16	90.00	0.64	90.00	60.00	30.00
100	3°00′	1°30.00′	50.00	0.22	99.99	0.87	100.00	66.67	33.34
110	3°18′	1°48.90′	55.00	0.29	109.99	1.16	110.00	73.34	36.67
120	3°36′	2°09.60′	60.00	0.38	119.98	1.51	119.99	80.01	40.01
130	3°54′	2°32.10′	65.00	0.48	129.97	1.92	129.99	86.68	43.34
140	4°12′	2°56.40′	69.99	0.60	139.96	2.39	139.98	93.35	46.68
150	4°30′	3°22.50′	74.99	0.74	149.95	2.94	149.98	100.02	50.02
160	4°48′	3°50.40′	79.99	0.89	159.93	3.57	159.97	106.69	53.36
170	5°06′	4°20.10′	84.98	1.07	169.90	4.29	169.96	113.37	56.70
180	5°24′	4°51.60′	89.98	1.27	179.87	5.09	179.94	120.05	60.04
190	5°42′	5°24.90′	94.97	1.50	189.83	5.98	189.92	126.73	63.39
200	6°00′	6°00.00′	99.96	1.74	199.78	6.98	199.90	133.41	66.74
210	6°18′	6°36.90′	104.95	2.02	209.72	8.07	209.88	140.10	70.09
220	6°36′	7°15.60′	109.94	2.32	219.65	9.28	219.84	146.79	73.45
230	6°54′	7°56.10′	114.93	2.65	229.56	10.60	229.80	153.49	76.81
240	7°12′	8°38.40′	119.91	3.01	239.45	12.04	239.76	160.19	80.17
250	7°30′	9°22.50′	124.89	3.41	249.33	13.61	249.70	166.90	83.55
260	7°48′	10°08.40′	129.86	3.83	259.19	15.30	259.64	173.62	86.93
270	8°06′	10°56.10′	134.84	4.29	269.02	17.13	269.56	180.34	90.31
280	8°24′	11°45.60′	139.80	4.78	278.82	19.10	279.48	187.08	93.71
290	8°42′	12°36.90′	144.77	5.31	288.60	21.21	289.38	193.83	97.12
300	9°00′	13°30.00′	149.72	5.88	298.34	23.47	299.26	200.58	100.53
310	9°18′	14°24.90′	154.67	6.48	308.04	25.88	309.13	207.36	103.96
320	9°36′	15°21.60′	159.62	7.13	317.71	28.45	318.98	214.14	107.40
330	9°54′	16°20.10′	164.55	7.82	327.33	31.18	328.81	220.94	110.86
340	10°12′	17°20.40′	169.48	8.55	336.90	34.08	338.62	227.76	114.33
350	10°30′	18°22.50′	174.40	9.32	346.42	37.14	348.40	234.60	117.82
360	10°48′	19°26.40′	179.31	10.14	355.88	40.38	358.16	241.46	121.33
370	11°06′	20°32.10′	184.21	11.00	365.28	43.80	367.89	248.35	124.86
380	11°24′	21°39.60′	189.10	11.91	374.61	47.40	377.59	255.26	128.42
390	11°42′	22°48.90′	193.97	12.87	383.86	51.18	387.26	262.19	132.00
400	12°00′	24°00.00′	198.84	13.88	393.04	55.15	396.89	269.16	135.60
410	12°18′	25°12.90′	203.68	14.93	402.13	59.32	406.48	276.16	139.24
420	12°36′	26°27.60′	208.52	16.04	411.13	63.68	416.03	283.19	142.91
430	12°54′	27°44.10′	213.33	17.20	420.03	68.23	425.54	290.27	146.61
440	13°12′	29°02.40′	218.13	18.41	428.83	72.98	435.00	297.38	150.35
450	13°30′	30°22.50′	222.91	19.68	437.52	77.94	444.40	304.54	154.13
460	13°48′	31°44.40′	227.67	21.00	446.08	83.10	453.76	311.75	157.96
470	14°06′	33°08.10′	232.40	22.38	454.52	88.46	463.05	319.00	161.83
480	14°24′	34°33.60′	237.12	23.82	462.83	94.03	472.28	326.32	165.76
490	14°42′	36°00.90′	241.81	25.31	470.99	99.81	481.45	333.69	169.74
500	15°00′	37°30.00′	246.47	26.86	479.00	105.79	490.55	341.13	173.78

TABLE V, THE STANDARD HIGHWAY SPIRAL

a = 3.0—Continued

L	D	S	q	p	X	Y	C	U	V
510	15°18′	39°00.90′	251.11	28.47	486.85	111.98	499.57	348.64	177.88
520	15°36′	40°33.60′	255.72	30.13	494.54	118.38	508.51	356.23	182.06
530	15°54′	42°08.10′	260.29	31.86	502.05	124.99	517.37	363.89	186.30
540	16°12′	43°44.40′	264.84	33.65	509.37	131.80	526.14	371.64	190.63
550	16°30′	45°22.50′	269.35	35.50	516.49	138.81	534.82	379.48	195.04
560	16°48′	47°02.40′	273.83	37.40	523.41	146.03	543.40	387.43	199.54
570	17°06′	48°44.10′	278.26	39.37	530.12	153.45	551.88	395.48	204.15
580	17°24′	50°27.60′	282.66	41.41	536.60	161.06	560.25	403.64	208.85
590	17°42′	52°12.90′	287.02	43.50	542.85	168.87	568.51	411.93	213.68
600	18°00′	54°00.00′	291.33	45.66	548.85	176.87	576.65	420.35	218.62
610	18°18′	55°48.90′	295.60	47.87	554.60	185.05	584.66	428.91	223.70
620	18°36′	57°39.60′	299.82	50.15	560.09	193.41	592.54	437.63	228.92
630	18°54′	59°32.10′	304.00	52.50	565.30	201.95	600.28	446.51	234.29
640	19°12′	61°26.40′	308.12	54.90	570.22	210.65	607.89	455.56	239.83
650	19°30′	63°22.50′	312.19	57.36	574.85	219.51	615.34	464.81	245.55
660	19°48′	65°20.40′	316.20	59.89	579.18	228.52	622.64	474.27	251.46
670	20°06′	67°20.10′	320.16	62.47	583.20	237.68	629.77	483.94	257.57
680	20°24′	69°21.60′	324.05	65.12	586.89	246.98	636.74	493.86	263.92
690	20°42′	71°24.90′	327.89	67.82	590.24	256.40	643.53	504.03	270.50
700	21°00′	73°30.00′	331.66	70.58	593.26	265.93	650.13	514.48	277.35
710	21°18′	75°36.90′	335.36	73.40	595.92	275.57	656.55	525.24	284.49
720	21°36′	77°45.60′	338.99	76.28	598.22	285.30	662.77	536.33	291.94
730	21°54′	79°56.10′	342.56	79.21	600.16	295.11	668.79	547.78	299.72
740	22°12′	82°08.40′	346.05	82.19	601.72	304.99	674.60	559.61	307.88
750	22°30′	84°22.50′	349.47	85.23	602.89	314.92	680.18	571.87	316.44
760	22°48′	86°38.40′	352.81	88.32	603.67	324.89	685.55	584.60	325.45
770	23°06′	88°56.10′	356.07	91.45	604.06	334.88	690.67	597.83	334.94
780	23°24′	91°15.60′	359.25	94.64	604.04	344.88	695.56	611.63	344.96
790	23°42′	93°36.90′	362.35	97.87	603.62	354.87	700.20	626.04	355.57
800	24°00′	96°00.00′	365.36	101.14	602.78	364.83	704.59	641.13	366.84
810	24°18′	98°24.90′	368.28	104.46	601.53	374.75	708.71	656.97	378.83
820	24°36′	100°51.60′	371.12	107.82	599.85	384.61	712.56	673.64	391.62

TABLE V, THE STANDARD HIGHWAY SPIRAL

a = 3.5

L	D	S	q	p	X	Y	C	U	V
10	0°21′	0°01.05′	5.00	0.00	10.00	0.00	10.00	6.67	3.33
20	0°42′	0°04.20′	10.00	0.00	20.00	0.01	20.00	13.33	6.67
30	1°03′	0°09.45′	15.00	0.01	30.00	0.03	30.00	20.00	10.00
40	1°24′	0°16.80′	20.00	0.02	40.00	0.07	40.00	26.67	13.33
50	1°45′	0°26.25′	25.00	0.03	50.00	0.13	50.00	33.33	16.67
60	2°06′	0°37.80′	30.00	0.05	60.00	0.22	60.00	40.00	20.00
70	2°27′	0°51.45′	35.00	0.09	70.00	0.35	70.00	46.67	23.33
80	2°48′	1°07.20′	40.00	0.13	80.00	0.52	80.00	53.33	26.67
90	3°09′	1°25.05′	45.00	0.19	89.99	0.74	90.00	60.00	30.00
100	3°30′	1°45.00′	50.00	0.25	99.99	1.02	100.00	66.67	33.34
110	3°51′	2°07.05′	55.00	0.34	109.98	1.35	109.99	73.34	36.67
120	4°12′	2°31.20′	60.00	0.44	119.98	1.76	119.99	80.01	40.01
130	4°33′	2°57.45′	64.99	0.56	129.97	2.24	129.98	86.68	43.34
140	4°54′	3°25.80′	69.99	0.70	139.95	2.79	139.98	93.35	46.68
150	5°15′	3°56.25′	74.99	0.86	149.93	3.43	149.97	100.02	50.02
160	5°36′	4°28.80′	79.98	1.04	159.90	4.17	159.96	106.70	53.36
170	5°57′	5°03.45′	84.98	1.25	169.87	5.00	169.94	113.38	56.71
180	6°18′	5°40.20′	89.97	1.48	179.82	5.93	179.92	120.06	60.06
190	6°39′	6°19.05′	94.96	1.75	189.77	6.98	189.90	126.75	63.41
200	7°00′	7°00.00′	99.95	2.04	199.70	8.14	199.87	133.44	66.76
210	7°21′	7°43.05′	104.94	2.36	209.62	9.42	209.83	140.13	70.12
220	7°42′	8°28.20′	109.92	2.71	219.52	10.82	219.79	146.83	73.49
230	8°03′	9°15.45′	114.90	3.09	229.40	12.36	229.73	153.54	76.86
240	8°24′	10°04.80′	119.88	3.51	239.26	14.04	239.67	160.26	80.24
250	8°45′	10°56.25′	124.85	3.97	249.09	15.87	249.60	166.99	83.62
260	9°06′	11°49.80′	129.82	4.47	258.89	17.84	259.51	173.72	87.02
270	9°27′	12°45.45′	134.78	5.00	268.66	19.97	269.41	180.47	90.43
280	9°48′	13°43.20′	139.73	5.58	278.40	22.26	279.29	187.23	93.85
290	10°09′	14°43.05′	144.68	6.19	288.09	24.71	289.15	194.01	97.28
300	10°30′	15°45.00′	149.62	6.85	297.74	27.34	298.99	200.80	100.73
310	10°51′	16°49.05′	154.56	7.56	307.34	30.14	308.81	207.61	104.19
320	11°12′	17°55.20′	159.48	8.31	316.88	33.13	318.61	214.44	107.67
330	11°33′	19°03.45′	164.39	9.11	326.37	36.30	328.38	221.29	111.17
340	11°54′	20°13.80′	169.30	9.96	335.79	39.66	338.12	228.16	114.70
350	12°15′	21°26.25′	174.19	10.86	345.13	43.22	347.83	235.07	118.24
360	12°36′	22°40.80′	179.06	11.81	354.40	46.97	357.50	242.00	121.82
370	12°57′	23°57.45′	183.93	12.81	363.58	50.93	367.13	248.96	125.42
380	13°18′	25°16.20′	188.77	13.87	372.67	55.09	376.72	255.96	129.06
390	13°39′	26°37.05′	193.61	14.98	381.67	59.47	386.27	263.00	132.73
400	14°00′	28°00.00′	198.42	16.15	390.55	64.06	395.77	270.08	136.44
410	14°21′	29°25.05′	203.21	17.38	399.32	68.86	405.22	277.21	140.19
420	14°42′	30°52.20′	207.98	18.66	407.97	73.88	414.61	284.38	143.99
430	15°03′	32°21.45′	212.73	20.01	416.49	79.12	423.94	291.61	147.83
440	15°24′	33°52.80′	217.46	21.41	424.86	84.58	433.20	298.89	151.73
450	15°45′	35°26.25′	222.16	22.88	433.09	90.27	442.40	306.24	155.69
460	16°06′	37°01.80′	226.83	24.41	441.15	96.18	451.52	313.66	159.71
470	16°27′	38°39.45′	231.48	26.00	449.05	102.32	460.56	321.15	163.79
480	16°48′	40°19.20′	236.09	27.66	456.77	108.67	469.52	328.71	167.95
490	17°09′	42°01.05′	240.67	29.38	464.30	115.26	478.39	336.37	172.19
500	17°30′	43°45.00′	245.22	31.16	471.62	122.06	487.16	344.12	176.51

TABLE V, THE STANDARD HIGHWAY SPIRAL

a = 3.5—Continued

L	D	S	q	p	X	Y	C	U	V
510	17°51′	45°31.05′	249.73	33.01	478.74	129.09	495.84	351.96	180.93
520	18°12′	47°19.20′	254.20	34.93	485.63	136.33	504.41	359.92	185.44
530	18°33′	49°09.45′	258.63	36.91	492.29	143.79	512.86	367.99	190.07
540	18°54′	51°01.80′	263.02	38.96	498.71	151.46	521.20	376.19	194.81
550	19°15′	52°56.25′	267.36	41.08	504.87	159.34	529.41	384.53	199.67
560	19°36′	54°52.80′	271.65	43.26	510.76	167.42	537.50	393.01	204.68
570	19°57′	56°51.45′	275.90	45.51	516.37	175.69	545.44	401.65	209.83
580	20°18′	58°52.20′	280.09	47.83	521.69	184.16	553.24	410.47	215.14
590	20°39′	60°55.05′	284.23	50.21	526.71	192.81	560.89	419.47	220.63
600	21°00′	63°00.00′	288.31	52.66	531.41	201.64	568.38	428.67	226.30
610	21°21′	65°07.05′	292.33	55.18	535.78	210.63	575.70	438.09	232.18
620	21°42′	67°16.20′	296.29	57.76	539.82	219.78	582.84	447.75	238.28
630	22°03′	69°27.45′	300.18	60.41	543.51	229.07	589.81	457.67	244.63
640	22°24′	71°40.80′	304.01	63.11	546.83	238.50	596.58	467.86	251.23
650	22°45′	73°56.25′	307.77	65.89	549.79	248.05	603.16	478.37	258.13
660	23°06′	76°13.80′	311.46	68.72	552.36	257.71	609.53	489.21	265.34
670	23°27′	78°33.45′	315.07	71.61	554.55	267.47	615.68	500.41	272.90
680	23°48′	80°55.20′	318.61	74.57	556.33	277.31	621.61	512.01	280.83
690	24°09′	83°19.05′	322.06	77.58	557.70	287.22	627.31	524.05	289.18
700	24°30′	85°45.00′	325.44	80.64	558.65	297.17	632.77	536.57	297.99
710	24°51′	88°13.05′	328.72	83.76	559.18	307.16	637.99	549.62	307.30
720	25°12′	90°43.20′	331.93	86.93	559.27	317.15	642.94	563.26	317.18
730	25°33′	93°15.45′	335.04	90.16	558.93	327.15	647.63	577.55	327.68
740	25°54′	95°49.80′	338.06	93.43	558.13	337.12	652.04	592.56	338.87
750	26°15′	98°26.25′	340.99	96.74	556.89	347.04	656.17	608.37	350.83
760	26°36′	101°04.80′	343.82	100.10	555.20	356.89	660.01	625.09	363.67

TABLE V, THE STANDARD HIGHWAY SPIRAL

a = 4.0

L	D	S	q	p	x	y	C	U	V
10	0°24′	0°01.20′	5.00	0.00	10.00	0.00	10.00	6.67	3.33
20	0°48′	0°04.80′	10.00	0.00	20.00	0.01	20.00	13.33	6.67
30	1°12′	0°10.80′	15.00	0.01	30.00	0.03	30.00	20.00	10.00
40	1°36′	0°19.20′	20.00	0.02	40.00	0.07	40.00	26.67	13.33
50	2°00′	0°30.00′	25.00	0.04	50.00	0.15	50.00	33.33	16.67
60	2°24′	0°43.20′	30.00	0.06	60.00	0.25	60.00	40.00	20.00
70	2°48′	0°58.80′	35.00	0.10	70.00	0.40	70.00	46.67	23.33
80	3°12′	1°16.80′	40.00	0.15	80.00	0.60	80.00	53.33	26.67
90	3°36′	1°37.20′	45.00	0.21	89.99	0.85	90.00	60.00	30.00
100	4°00′	2°00.00′	50.00	0.29	99.99	1.16	99.99	66.67	33.34
110	4°24′	2°25.20′	55.00	0.39	109.98	1.55	109.99	73.34	36.67
120	4°48′	2°52.80′	59.99	0.50	119.97	2.01	119.99	80.01	40.01
130	5°12′	3°22.80′	64.99	0.64	129.95	2.56	129.98	86.68	43.35
140	5°36′	3°55.20′	69.99	0.80	139.93	3.19	139.97	93.36	46.69
150	6°00′	4°30.00′	74.98	0.98	149.91	3.93	149.96	100.03	50.03
160	6°24′	5°07.20′	79.98	1.19	159.87	4.76	159.94	106.71	53.37
170	6°48′	5°46.80′	84.97	1.43	169.83	5.71	169.92	113.39	56.72
180	7°12′	6°28.80′	89.96	1.70	179.77	6.78	179.90	120.08	60.07
190	7°36′	7°13.20′	94.95	1.99	189.70	7.97	189.87	126.77	63.43
200	8°00′	8°00.00′	99.94	2.33	199.61	9.30	199.83	133.47	66.79
210	8°24′	8°49.20′	104.92	2.69	209.50	10.76	209.78	140.17	70.16
220	8°48′	9°40.80′	109.90	3.09	219.37	12.36	219.72	146.89	73.53
230	9°12′	10°34.80′	114.87	3.53	229.22	14.12	229.65	153.61	76.92
240	9°36′	11°31.20′	119.84	4.02	239.03	16.04	239.57	160.34	80.31
250	10°00′	12°30.00′	124.80	4.54	248.81	18.12	249.47	167.08	83.71
260	10°24′	13°31.20′	129.76	5.10	258.56	20.37	259.36	173.84	87.13
270	10°48′	14°34.80′	134.71	5.71	268.26	22.80	269.22	180.61	90.56
280	11°12′	15°40.80′	139.65	6.37	277.91	25.41	279.07	187.40	94.00
290	11°36′	16°49.20′	144.58	7.07	287.51	28.20	288.89	194.21	97.47
300	12°00′	18°00.00′	149.51	7.83	297.05	31.20	298.69	201.04	100.95
310	12°24′	19°13.20′	154.42	8.63	306.53	34.39	308.45	207.90	104.45
320	12°48′	20°28.80′	159.32	9.49	315.94	37.78	318.19	214.78	107.98
330	13°12′	21°46.80′	164.21	10.40	325.26	41.38	327.89	221.69	111.54
340	13°36′	23°07.20′	169.08	11.37	334.51	45.20	337.55	228.63	115.12
350	14°00′	24°30.00′	173.94	12.39	343.65	49.24	347.16	235.61	118.74
360	14°24′	25°55.20′	178.78	13.47	352.70	53.50	356.74	242.62	122.39
370	14°48′	27°22.80′	183.60	14.61	361.64	57.98	366.26	249.68	126.08
380	15°12′	28°52.80′	188.40	15.82	370.46	62.70	375.73	256.79	129.81
390	15°36′	30°25.20′	193.18	17.08	379.15	67.64	385.14	263.95	133.59
400	16°00′	32°00.00′	197.94	18.41	387.70	72.82	394.48	271.16	137.43
410	16°24′	33°37.20′	202.67	19.80	396.11	78.24	403.76	278.43	141.31
420	16°48′	35°16.80′	207.37	21.26	404.35	83.90	412.97	285.77	145.26
430	17°12′	36°58.80′	212.05	22.79	412.43	89.79	422.09	293.18	149.27
440	17°36′	38°43.20′	216.69	24.38	420.33	95.93	431.13	300.67	153.36
450	18°00′	40°30.00′	221.30	26.04	428.03	102.30	440.09	308.25	157.52
460	18°24′	42°19.20′	225.88	27.77	435.53	108.92	448.94	315.91	161.77
470	18°48′	44°10.80′	230.42	29.57	442.81	115.77	457.70	323.68	166.12
480	19°12′	46°04.80′	234.92	31.44	449.87	122.86	466.34	331.56	170.56
490	19°36′	48°01.20′	239.37	33.38	456.68	130.17	474.87	339.56	175.11
500	20°00′	50°00.00′	243.79	35.39	463.24	137.72	483.28	347.68	179.78

TABLE V, THE STANDARD HIGHWAY SPIRAL

a = 4.0—Continued

L	D	S	q	p	X	Y	C	U	V
510	20°24′	52°01.20′	248.15	37.47	469.53	145.49	491.56	355.94	184.58
520	20°48′	54°04.80′	252.47	39.62	475.55	153.48	499.70	364.36	189.52
530	21°12′	56°10.80′	256.73	41.85	481.26	161.69	507.70	372.94	194.62
540	21°36′	58°19.20′	260.94	44.15	486.67	170.10	515.54	381.70	199.88
550	22°00′	60°30.00′	265.09	46.51	491.76	178.71	523.23	390.66	205.32
560	22°24′	62°43.20′	269.18	48.95	496.52	187.50	530.74	399.82	210.97
570	22°48′	64°58.80′	273.21	51.46	500.92	196.48	538.08	409.22	216.82
580	23°12′	67°16.80′	277.17	54.04	504.97	205.62	545.23	418.87	222.92
590	23°36′	69°37.20′	281.06	56.69	508.64	214.92	552.19	428.80	229.27
600	24°00′	72°00.00′	284.88	59.40	511.93	224.36	558.94	439.03	235.91
610	24°24′	74°25.20′	288.63	62.19	514.82	233.94	565.48	449.59	242.86
620	24°48′	76°52.80′	292.30	65.04	517.30	243.62	571.80	460.52	250.15
630	25°12′	79°22.80′	295.89	67.95	519.36	253.41	577.88	471.84	257.83
640	25°36′	81°55.20′	299.39	70.92	520.98	263.23	583.73	483.61	265.92
650	26°00′	84°30.00′	302.81	73.96	522.16	273.20	589.32	495.86	274.47
660	26°24′	87°07.20′	306.14	77.05	522.90	283.18	594.65	508.65	283.54
670	26°48′	89°46.80′	309.38	80.20	523.17	293.17	599.71	522.04	293.17
680	27°12′	92°28.80′	312.52	83.41	522.97	303.17	604.49	536.10	303.45
690	27°36′	95°13.20′	315.57	86.67	522.30	313.15	608.98	550.91	314.45
700	28°00′	98°00.00′	318.51	89.97	521.15	323.08	613.17	566.55	326.25
710	28°24′	100°49.20′	321.36	93.33	519.51	332.94	617.05	583.15	338.97

TABLE V, THE STANDARD HIGHWAY SPIRAL

$a = 4.5$

L	D	S	q	p	X	Y	C	U	V
10	0°27′	0°01.35′	5.00	0.00	10.00	0.00	10.00	6.67	3.33
20	0°54′	0°05.40′	10.00	0.00	20.00	0.01	20.00	13.33	6.67
30	1°21′	0°12.15′	15.00	0.01	30.00	0.04	30.00	20.00	10.00
40	1°48′	0°21.60′	20.00	0.02	40.00	0.08	40.00	26.67	13.33
50	2°15′	0°33.75′	25.00	0.04	50.00	0.16	50.00	33.33	16.67
60	2°42′	0°48.60′	30.00	0.07	60.00	0.28	60.00	40.00	20.00
70	3°09′	1°06.15′	35.00	0.11	70.00	0.45	70.00	46.67	23.33
80	3°36′	1°26.40′	40.00	0.17	79.99	0.67	80.00	53.34	26.67
90	4°03′	1°49.35′	45.00	0.24	89.99	0.95	90.00	60.00	30.00
100	4°30′	2°15.00′	50.00	0.33	99.98	1.31	99.99	66.67	33.34
110	4°57′	2°43.35′	55.00	0.44	109.98	1.74	109.99	73.34	36.67
120	5°24′	3°14.40′	59.99	0.57	119.96	2.26	119.98	80.01	40.01
130	5°51′	3°48.15′	64.99	0.72	129.94	2.87	129.97	86.69	43.35
140	6°18′	4°24.60′	69.99	0.90	139.92	3.59	139.96	93.36	46.69
150	6°45′	5°03.75′	74.98	1.10	149.88	4.42	149.95	100.04	50.04
160	7°12′	5°45.60′	79.97	1.34	159.84	5.36	159.93	106.72	53.38
170	7°39′	6°30.15′	84.96	1.61	169.78	6.43	169.90	113.41	56.74
180	8°06′	7°17.40′	89.95	1.91	179.71	7.63	179.87	120.10	60.09
190	8°33′	8°07.35′	94.94	2.24	189.62	8.97	189.83	126.80	63.45
200	9°00′	9°00.00′	99.92	2.62	199.51	10.45	199.78	133.51	66.82
210	9°27′	9°55.35′	104.90	3.03	209.37	12.10	209.72	140.22	70.20
220	9°54′	10°53.40′	109.87	3.48	219.21	13.90	219.65	146.95	73.59
230	10°21′	11°54.15′	114.83	3.98	229.01	15.88	229.56	153.68	76.98
240	10°48′	12°57.60′	119.80	4.52	238.77	18.03	239.45	160.43	80.39
250	11°15′	14°03.75′	124.75	5.10	248.50	20.37	249.33	167.20	83.81
260	11°42′	15°12.60′	129.70	5.74	258.17	22.89	259.19	173.98	87.25
270	12°09′	16°24.15′	134.63	6.42	267.80	25.61	269.02	180.78	90.71
280	12°36′	17°38.40′	139.56	7.16	277.36	28.54	278.82	187.60	94.18
290	13°03′	18°55.35′	144.47	7.95	286.85	31.68	288.60	194.45	97.68
300	13°30′	20°15.00′	149.38	8.80	296.27	35.03	298.34	201.32	101.21
310	13°57′	21°37.35′	154.27	9.70	305.61	38.60	308.04	208.23	104.76
320	14°24′	23°02.40′	159.14	10.66	314.86	42.40	317.71	215.17	108.34
330	14°51′	24°30.15′	164.00	11.68	324.02	46.43	327.33	222.15	111.95
340	15°18′	26°00.60′	168.84	12.77	333.06	50.70	336.90	229.16	115.61
350	15°45′	27°33.75′	173.66	13.92	341.99	55.20	346.41	236.23	119.30
360	16°12′	29°09.60′	178.46	15.13	350.79	59.95	355.87	243.34	123.04
370	16°39′	30°48.15′	183.23	16.41	359.45	64.95	365.27	250.51	126.83
380	17°06′	32°29.40′	187.98	17.75	367.96	70.19	374.60	257.74	130.68
390	17°33′	34°13.35′	192.70	19.17	376.31	75.69	383.85	265.03	134.59
400	18°00′	36°00.00′	197.40	20.65	384.49	81.44	393.03	272.40	138.56
410	18°27′	37°49.35′	202.06	22.21	392.49	87.45	402.11	279.84	142.61
420	18°54′	39°41.40′	206.69	23.83	400.29	93.71	411.11	287.38	146.73
430	19°21′	41°36.15′	211.28	25.53	407.88	100.22	420.01	295.01	150.94
440	19°48′	43°33.60′	215.83	27.31	415.24	106.99	428.80	302.74	155.25
450	20°15′	45°33.75′	220.34	29.16	422.36	114.00	437.48	310.58	159.66
460	20°42′	47°36.60′	224.81	31.08	429.24	121.26	446.04	318.55	164.19
470	21°09′	49°42.15′	229.23	33.08	435.84	128.77	454.47	326.65	168.84
480	21°36′	51°50.40′	233.60	35.15	442.17	136.52	462.76	334.89	173.62
490	22°03′	54°01.35′	237.92	37.30	448.20	144.50	470.91	343.30	178.56
500	22°30′	56°15.00′	242.18	39.53	453.91	152.70	478.91	351.88	183.65

TABLE V, THE STANDARD HIGHWAY SPIRAL

a = 4.5—Continued

L	D	S	q	p	X	Y	C	U	V
510	22°57′	58°31.35′	246.38	41.83	459.30	161.12	486.74	360.65	188.92
520	23°24′	60°50.40′	250.53	44.20	464.35	169.75	494.41	369.63	194.39
530	23°51′	63°12.15′	254.61	46.66	469.04	178.58	501.89	378.84	200.07
540	24°18′	65°36.60′	258.62	49.18	473.36	187.60	509.18	388.30	205.98
550	24°45′	68°03.75′	262.56	51.78	477.30	196.79	516.27	398.04	212.16
560	25°12′	70°33.60′	266.43	54.46	480.83	206.15	523.16	408.07	218.61
570	25°39′	73°06.15′	270.22	57.20	483.95	215.65	529.82	418.44	225.38
580	26°06′	75°41.40′	273.92	60.01	486.64	225.28	536.25	429.17	232.49
590	26°33′	78°19.35′	277.55	62.90	488.89	235.02	542.44	440.31	239.99
600	27°00′	81°00.00′	281.09	65.85	490.68	244.86	548.38	451.90	247.91
610	27°27′	83°43.35′	284.54	68.86	492.01	254.77	554.06	463.99	256.31
620	27°54′	86°29.40′	287.89	71.94	492.87	264.73	559.46	476.63	265.23
630	28°21′	89°18.15′	291.15	75.08	493.23	274.72	564.58	489.89	274.74
640	28°48′	92°09.60′	294.30	78.28	493.11	284.72	569.40	503.84	284.92
650	29°15′	95°03.75′	297.36	81.53	492.48	294.70	573.92	518.58	295.86
660	29°42′	98°00.60′	300.31	84.84	491.34	304.64	578.11	534.21	307.64
670	30°09′	101°00.15′	303.15	88.19	489.69	314.50	581.98	550.83	320.39

TABLE V, THE STANDARD HIGHWAY SPIRAL

$a = 5.0$

L	D	S	q	p	X	Y	C	U	V
10	0°30′	0°01.50′	5.00	0.00	10.00	0.00	10.00	6.67	3.33
20	1°00′	0°06.00′	10.00	0.00	20.00	0.01	20.00	13.33	6.67
30	1°30′	0°13.50′	15.00	0.01	30.00	0.04	30.00	20.00	10.00
40	2°00′	0°24.00′	20.00	0.02	40.00	0.09	40.00	26.67	13.33
50	2°30′	0°37.50′	25.00	0.05	50.00	0.18	50.00	33.33	16.67
60	3°00′	0°54.00′	30.00	0.08	60.00	0.31	60.00	40.00	20.00
70	3°30′	1°13.50′	35.00	0.12	70.00	0.50	70.00	46.67	23.33
80	4°00′	1°36.00′	40.00	0.19	79.99	0.74	80.00	53.34	26.67
90	4°30′	2°01.50′	45.00	0.27	89.99	1.06	90.00	60.00	30.00
100	5°00′	2°30.00′	50.00	0.36	99.98	1.45	99.99	66.67	33.34
110	5°30′	3°01.50′	54.99	0.48	109.97	1.94	109.99	73.34	36.68
120	6°00′	3°36.00′	59.99	0.63	119.95	2.51	119.98	80.02	40.02
130	6°30′	4°13.50′	64.99	0.80	129.93	3.19	129.97	86.69	43.36
140	7°00′	4°54.00′	69.98	1.00	139.90	3.99	139.95	93.37	46.70
150	7°30′	5°37.50′	74.98	1.23	149.86	4.91	149.94	100.05	50.05
160	8°00′	6°24.00′	79.97	1.49	159.80	5.95	159.91	106.74	53.40
170	8°30′	7°13.50′	84.95	1.79	169.73	7.14	169.88	113.43	56.75
180	9°00′	8°06.00′	89.94	2.12	179.64	8.47	179.84	120.13	60.11
190	9°30′	9°01.50′	94.92	2.49	189.53	9.96	189.79	126.83	63.48
200	10°00′	10°00.00′	99.90	2.91	199.39	11.61	199.73	133.55	66.86
210	10°30′	11°01.50′	104.87	3.36	209.22	13.43	209.65	140.27	70.25
220	11°00′	12°06.00′	109.84	3.87	219.02	15.44	219.56	147.01	73.65
230	11°30′	13°13.50′	114.80	4.42	228.78	17.63	229.46	153.76	77.06
240	12°00′	14°24.00′	119.75	5.02	238.49	20.02	239.33	160.53	80.48
250	12°30′	15°37.50′	124.69	5.67	248.15	22.61	249.17	167.32	83.93
260	13°00′	16°54.00′	129.62	6.37	257.75	25.40	259.00	174.13	87.39
270	13°30′	18°13.50′	134.55	7.13	267.28	28.42	268.79	180.96	90.88
280	14°00′	19°36.00′	139.46	7.95	276.74	31.66	278.55	187.82	94.39
290	14°30′	21°01.50′	144.35	8.83	286.12	35.13	288.27	194.71	97.92
300	15°00′	22°30.00′	149.23	9.76	295.41	38.84	297.95	201.64	101.49
310	15°30′	24°01.50′	154.10	10.76	304.59	42.79	307.58	208.60	105.10
320	16°00′	25°36.00′	158.94	11.83	313.67	46.98	317.17	215.61	108.74
330	16°30′	27°13.50′	163.77	12.96	322.63	51.43	326.70	222.66	112.42
340	17°00′	28°54.00′	168.57	14.16	331.45	56.13	336.17	229.76	116.15
350	17°30′	30°37.50′	173.35	15.43	340.13	61.10	345.58	236.92	119.94
360	18°00′	32°24.00′	178.10	16.77	348.66	66.32	354.91	244.15	123.78
370	18°30′	34°13.50′	182.82	18.19	357.01	71.82	364.17	251.44	127.68
380	19°00′	36°06.00′	187.51	19.67	365.19	77.57	373.34	258.81	131.66
390	19°30′	38°01.50′	192.17	21.23	373.17	83.60	382.42	266.26	135.71
400	20°00′	40°00.00′	196.79	22.87	380.94	89.89	391.40	273.81	139.85
410	20°30′	42°01.50′	201.38	24.58	388.49	96.45	400.28	281.46	144.08
420	21°00′	44°06.00′	205.92	26.38	395.79	103.28	409.05	289.21	148.41
430	21°30′	46°13.50′	210.42	28.25	402.84	110.37	417.69	297.09	152.86
440	22°00′	48°24.00′	214.87	30.20	409.62	117.72	426.20	305.10	157.42
450	22°30′	50°37.50′	219.27	32.23	416.12	125.33	434.58	313.26	162.13
460	23°00′	52°54.00′	223.62	34.33	422.30	133.18	442.81	321.58	166.98
470	23°30′	55°13.50′	227.91	36.52	428.17	141.28	450.88	330.08	171.99
480	24°00′	57°36.00′	232.14	38.79	433.71	149.60	458.78	338.76	177.19
490	24°30′	60°01.50′	236.31	41.14	438.89	158.16	466.51	347.66	182.58
500	25°00′	62°30.00′	240.41	43.57	443.69	166.93	474.05	356.80	188.19

TABLE V, THE STANDARD HIGHWAY SPIRAL

a = 5.0—Continued

L	D	S	q	p	X	Y	C	U	V
510	25°30′	65°01.50′	244.44	46.07	448.11	175.89	481.40	366.19	194.04
520	26°00′	67°36.00′	248.39	48.66	452.13	185.05	488.54	375.86	200.15
530	26°30′	70°13.50′	252.27	51.32	455.73	194.38	495.45	385.85	206.56
540	27°00′	72°54.00′	256.07	54.06	458.89	203.87	502.14	396.18	213.29
550	27°30′	75°37.50′	259.78	56.87	461.61	213.49	508.58	406.89	220.39
560	28°00′	78°24.00′	263.41	59.75	463.85	223.23	514.78	418.03	227.89
570	28°30′	81°13.50′	266.94	62.71	465.62	233.07	520.70	429.65	235.83
580	29°00′	84°06.00′	270.38	65.73	466.90	242.99	526.35	441.79	244.29
590	29°30′	87°01.50′	273.71	68.82	467.68	252.96	531.70	454.53	253.30
600	30°00′	90°00.00′	276.95	71.97	467.94	262.96	536.76	467.94	262.96
610	30°30′	93°01.50′	280.08	75.18	467.67	272.95	541.50	482.10	273.33
620	31°00′	96°06.00′	283.10	78.45	466.88	282.92	545.91	497.11	284.53
630	31°30′	99°13.50′	286.01	81.78	465.55	292.83	549.98	513.10	296.66
640	32°00′	102°24.00′	288.80	85.15	463.67	302.65	553.70	530.21	309.88

TABLE V, THE STANDARD HIGHWAY SPIRAL

a = 5.5

L	D	S	q	p	X	Y	C	U	V
10	0°33′	0°01.65′	5.00	0.00	10.00	0.00	10.00	6.67	3.33
20	1°06′	0°06.60′	10.00	0.00	20.00	0.01	20.00	13.33	6.67
30	1°39′	0°14.85′	15.00	0.01	30.00	0.04	30.00	20.00	10.00
40	2°12′	0°26.40′	20.00	0.03	40.00	0.10	40.00	26.67	13.33
50	2°45′	0°41.25′	25.00	0.05	50.00	0.20	50.00	33.33	16.67
60	3°18′	0°59.40′	30.00	0.09	60.00	0.35	60.00	40.00	20.00
70	3°51′	1°20.85′	35.00	0.14	70.00	0.55	70.00	46.67	23.33
80	4°24′	1°45.60′	40.00	0.20	79.99	0.82	80.00	53.34	26.67
90	4°57′	2°13.65′	45.00	0.29	89.99	1.17	89.99	60.00	30.00
100	5°30′	2°45.00′	50.00	0.40	99.98	1.60	99.99	66.67	33.34
110	6°03′	3°19.65′	54.99	0.53	109.96	2.13	109.98	73.35	36.68
120	6°36′	3°57.60′	59.99	0.69	119.94	2.76	119.97	80.02	40.02
130	7°09′	4°38.85′	64.99	0.88	129.91	3.51	129.96	86.70	43.36
140	7°42′	5°23.40′	69.98	1.10	139.88	4.39	139.94	93.38	46.71
150	8°15′	6°11.25′	74.97	1.35	149.83	5.40	149.92	100.06	50.06
160	8°48′	7°02.40′	79.96	1.64	159.76	6.55	159.89	106.75	53.41
170	9°21′	7°56.85′	84.95	1.96	169.67	7.85	169.85	113.45	56.77
180	9°54′	8°54.60′	89.93	2.33	179.57	9.31	179.81	120.15	60.14
190	10°27′	9°55.65′	94.91	2.74	189.43	10.95	189.75	126.87	63.51
200	11°00′	11°00.00′	99.88	3.20	199.26	12.77	199.67	133.59	66.90
210	11°33′	12°07.65′	104.84	3.70	209.06	14.77	209.58	140.33	70.30
220	12°06′	13°18.60′	109.80	4.25	218.82	16.97	219.47	147.08	73.71
230	12°39′	14°32.85′	114.75	4.86	228.52	19.38	229.34	153.85	77.14
240	13°12′	15°50.40′	119.69	5.51	238.17	22.00	239.19	160.65	80.59
250	13°45′	17°11.25′	124.63	6.23	247.76	24.84	249.00	167.46	84.05
260	14°18′	18°35.40′	129.55	7.00	257.28	27.91	258.79	174.30	87.56
270	14°51′	20°02.85′	134.45	7.84	266.71	31.22	268.53	181.17	91.06
280	15°24′	21°33.60′	139.34	8.74	276.06	34.77	278.24	188.07	94.61
290	15°57′	23°07.65′	144.22	9.70	285.31	38.57	287.91	195.01	98.19
300	16°30′	24°45.00′	149.07	10.73	294.45	42.62	297.52	201.99	101.81
310	17°03′	26°25.65′	153.91	11.83	303.47	46.94	307.08	209.02	105.47
320	17°36′	28°09.60′	158.72	12.99	312.36	51.53	316.58	216.10	109.18
330	18°09′	29°56.85′	163.51	14.23	321.10	56.38	326.01	223.23	112.94
340	18°42′	31°47.40′	168.27	15.55	329.68	61.51	335.37	230.43	116.76
350	19°15′	33°41.25′	173.00	16.94	338.09	66.92	344.65	237.70	120.65
360	19°48′	35°38.40′	177.70	18.41	346.32	72.61	353.85	245.05	124.61
370	20°21′	37°38.85′	182.37	19.95	354.34	78.57	362.95	252.49	128.64
380	20°54′	39°42.60′	187.00	21.57	362.15	84.82	371.95	260.02	132.76
390	21°27′	41°49.65′	191.59	23.28	369.72	91.35	380.84	267.65	136.98
400	22°00′	44°00.00′	196.13	25.07	377.05	98.16	389.61	275.40	141.31
410	22°33′	46°13.65′	200.63	26.93	384.10	105.24	398.26	283.27	145.75
420	23°06′	48°30.60′	205.08	28.89	390.88	112.60	406.77	291.29	150.32
430	23°39′	50°50.85′	209.48	30.92	397.35	120.22	415.14	299.46	155.03
440	24°12′	53°14.40′	213.82	33.04	403.50	128.11	423.35	307.80	159.90
450	24°45′	55°41.25′	218.10	35.24	409.31	136.24	431.39	316.33	164.95
460	25°18′	58°11.40′	222.31	37.53	414.77	144.62	439.26	325.06	170.18
470	25°51′	60°44.85′	226.46	39.90	419.85	153.24	446.94	334.02	175.63
480	26°24′	63°21.60′	230.54	42.35	424.53	162.07	454.42	343.23	181.32
490	26°57′	66°01.65′	234.55	44.89	428.81	171.11	461.69	352.72	187.26
500	27°30′	68°45.00′	238.47	47.50	432.65	180.34	468.73	362.52	193.49

TABLE V, THE STANDARD HIGHWAY SPIRAL

a = 5.5—Continued

L	D	S	q	p	x	y	C	U	V
510	28°03′	71°31.65′	242.31	50.20	436.05	189.74	475.54	372.67	200.05
520	28°36′	74°21.60′	246.07	52.97	438.98	199.30	482.11	383.19	206.96
530	29°09′	77°14.85′	249.73	55.83	441.44	208.99	488.41	394.14	214.28
540	29°42′	80°11.40′	253.30	58.75	443.39	218.80	494.44	405.56	222.05
550	30°15′	83°11.25′	256.77	61.75	444.84	228.69	500.18	417.52	230.32
560	30°48′	86°14.40′	260.14	64.82	445.76	238.65	505.63	430.08	239.16
570	31°21′	89°20.85′	263.40	67.96	446.15	248.64	510.75	443.32	248.66
580	31°54′	92°30.60′	266.55	71.16	445.99	258.64	515.56	457.32	258.89
590	32°27′	95°43.65′	269.58	74.42	445.27	268.61	520.02	472.21	269.96
600	33°00′	99°00.00′	272.50	77.74	443.99	278.53	524.12	488.10	282.00
610	33°33′	102°19.65′	275.30	81.12	442.14	288.35	527.86	505.16	295.16

TABLE V, THE STANDARD HIGHWAY SPIRAL

$a = 6.0$

L	D	S	q	p	X	Y	C	U	V
10	0°36′	0°01.80′	5.00	0.00	10.00	0.00	10.00	6.67	3.33
20	1°12′	0°07.20′	10.00	0.00	20.00	0.01	20.00	13.33	6.67
30	1°48′	0°16.20′	15.00	0.01	30.00	0.05	30.00	20.00	10.00
40	2°24′	0°28.80′	20.00	0.03	40.00	0.11	40.00	26.67	13.33
50	3°00′	0°45.00′	25.00	0.05	50.00	0.22	50.00	33.33	16.67
60	3°36′	1°04.80′	30.00	0.09	60.00	0.38	60.00	40.00	20.00
70	4°12′	1°28.20′	35.00	0.15	70.00	0.60	70.00	46.67	23.33
80	4°48′	1°55.20′	40.00	0.22	79.99	0.89	80.00	53.34	26.67
90	5°24′	2°25.80′	45.00	0.32	89.98	1.27	89.99	60.01	30.01
100	6°00′	3°00.00′	50.00	0.44	99.97	1.74	99.99	66.68	33.34
110	6°36′	3°37.80′	54.99	0.58	109.96	2.32	109.98	73.35	36.68
120	7°12′	4°19.20′	59.99	0.75	119.93	3.01	119.97	80.02	40.02
130	7°48′	5°04.20′	64.98	0.96	129.90	3.83	129.95	86.70	43.37
140	8°24′	5°52.80′	69.98	1.20	139.85	4.79	139.93	93.38	46.71
150	9°00′	6°45.00′	74.97	1.47	149.79	5.88	149.91	100.07	50.07
160	9°36′	7°40.80′	79.95	1.79	159.71	7.14	159.87	106.77	53.42
170	10°12′	8°40.20′	84.94	2.14	169.61	8.56	169.83	113.47	56.79
180	10°48′	9°43.20′	89.91	2.54	179.48	10.16	179.77	120.18	60.16
190	11°24′	10°49.80′	94.89	2.99	189.32	11.94	189.70	126.90	63.55
200	12°00′	12°00.00′	99.85	3.49	199.12	13.92	199.61	133.64	66.95
210	12°36′	13°13.80′	104.81	4.03	208.88	16.10	209.50	140.39	70.36
220	13°12′	14°31.20′	109.76	4.64	218.59	18.50	219.37	147.16	73.78
230	13°48′	15°52.20′	114.71	5.29	228.24	21.12	229.22	153.95	77.23
240	14°24′	17°16.80′	119.64	6.01	237.83	23.97	239.03	160.77	80.70
250	15°00′	18°45.00′	124.56	6.79	247.34	27.06	248.81	167.61	84.19
260	15°36′	20°16.80′	129.46	7.63	256.76	30.40	258.56	174.48	87.71
270	16°12′	21°52.20′	134.35	8.54	266.09	34.00	268.26	181.39	91.27
280	16°48′	23°31.20′	139.22	9.52	275.32	37.85	277.91	188.34	94.86
290	17°24′	25°13.80′	144.07	10.57	284.43	41.98	287.51	195.33	98.49
300	18°00′	27°00.00′	148.90	11.69	293.41	46.38	297.05	202.38	102.16
310	18°36′	28°49.80′	153.70	12.88	302.24	51.06	306.53	209.48	105.89
320	19°12′	30°43.20′	158.48	14.15	310.92	56.03	315.93	216.64	109.68
330	19°48′	32°40.20′	163.23	15.50	319.43	61.28	325.26	223.87	113.52
340	20°24′	34°40.80′	167.94	16.93	327.75	66.82	334.50	231.17	117.44
350	21°00′	36°45.00′	172.63	18.44	335.87	72.66	343.64	238.57	121.44
360	21°36′	38°52.80′	177.27	20.03	343.77	78.79	352.69	246.06	125.52
370	22°12′	41°04.20′	181.88	21.70	351.44	85.21	361.62	253.65	129.71
380	22°48′	43°19.20′	186.44	23.46	358.84	91.93	370.43	261.36	133.99
390	23°24′	45°37.80′	190.95	25.30	365.98	98.93	379.12	269.20	138.40
400	24°00′	48°00.00′	195.41	27.24	372.82	106.22	387.66	277.18	142.94
410	24°36′	50°25.80′	199.82	29.25	379.36	113.80	396.06	285.32	147.62
420	25°12′	52°55.20′	204.17	31.36	385.56	121.64	404.29	293.63	152.47
430	25°48′	55°28.20′	208.46	33.55	391.41	129.75	412.35	302.13	157.49
440	26°24′	58°04.80′	212.68	35.83	396.89	138.11	420.23	310.85	162.72
450	27°00′	60°45.00′	216.83	38.20	401.98	146.72	427.92	319.81	168.16
460	27°36′	63°28.80′	220.90	40.66	406.65	155.56	435.39	329.03	173.85
470	28°12′	66°16.20′	224.90	43.20	410.90	164.61	442.65	338.54	179.81
480	28°48′	69°07.20′	228.82	45.82	414.70	173.86	449.67	348.37	186.08
490	29°24′	72°01.80′	232.65	48.53	418.02	183.29	456.44	358.57	192.69
500	30°00′	75°00.00′	236.38	51.32	420.86	192.88	462.95	369.18	199.68

TABLE V, THE STANDARD HIGHWAY SPIRAL

a = 6.0—Continued

L	D	S	q	p	X	Y	C	U	V
510	30°36′	78°01.80′	240.02	54.19	423.19	202.60	469.19	380.24	207.10
520	31°12′	81°07.20′	243.56	57.14	425.00	212.43	475.14	391.81	215.01
530	31°48′	84°16.20′	247.00	60.17	426.27	222.35	480.78	403.96	223.47
540	32°24′	87°28.80′	250.33	63.26	426.99	232.32	486.11	416.77	232.55
550	33°00′	90°45.00′	253.54	66.43	427.15	242.32	491.10	430.32	242.34
560	33°36′	94°04.80′	256.64	69.66	426.73	252.31	495.74	444.73	252.95
570	34°12′	97°28.20′	259.61	72.95	425.72	262.26	500.02	460.11	264.50
580	34°48′	100°55.20′	262.47	76.30	424.13	272.13	503.92	476.63	277.15

TABLE V, THE STANDARD HIGHWAY SPIRAL

a = 6.5

L	D	S	q	p	X	Y	C	U	V
10	0°39′	0°01.95′	5.00	0.00	10.00	0.00	10.00	6.67	3.33
20	1°18′	0°07.80′	10.00	0.00	20.00	0.02	20.00	13.33	6.67
30	1°57′	0°17.55′	15.00	0.01	30.00	0.05	30.00	20.00	10.00
40	2°36′	0°31.20′	20.00	0.03	40.00	0.12	40.00	26.67	13.33
50	3°15′	0°48.75′	25.00	0.06	50.00	0.24	50.00	33.33	16.67
60	3°54′	1°10.20′	30.00	0.10	60.00	0.41	60.00	40.00	20.00
70	4°33′	1°35.55′	35.00	0.16	69.99	0.65	70.00	46.67	23.34
80	5°12′	2°04.80′	40.00	0.24	79.99	0.97	80.00	53.34	26.67
90	5°51′	2°37.95′	45.00	0.34	89.98	1.38	89.99	60.01	30.01
100	6°30′	3°15.00′	49.99	0.47	99.97	1.89	99.99	66.68	33.34
110	7°09′	3°55.95′	54.99	0.63	109.95	2.52	109.98	73.35	36.68
120	7°48′	4°40.80′	59.99	0.82	119.92	3.27	119.96	80.03	40.03
130	8°27′	5°29.55′	64.98	1.04	129.88	4.15	129.95	86.71	43.37
140	9°06′	6°22.20′	69.97	1.30	139.83	5.18	139.92	93.39	46.72
150	9°45′	7°18.75′	74.96	1.59	149.76	6.37	149.89	100.09	50.08
160	10°24′	8°19.20′	79.94	1.93	159.66	7.73	159.85	106.78	53.44
170	11°03′	9°23.55′	84.92	2.32	169.54	9.27	169.80	113.49	56.81
180	11°42′	10°31.80′	89.90	2.75	179.39	11.00	179.73	120.21	60.19
190	12°21′	11°43.95′	94.87	3.24	189.20	12.93	189.65	126.95	63.59
200	13°00′	13°00.00′	99.83	3.77	198.97	15.07	199.54	133.69	67.00
210	13°39′	14°19.95′	104.78	4.37	208.69	17.43	209.42	140.46	70.42
220	14°18′	15°43.80′	109.72	5.02	218.35	20.02	219.26	147.25	73.86
230	14°57′	17°11.55′	114.66	5.73	227.94	22.86	229.08	154.06	77.33
240	15°36′	18°43.20′	119.57	6.51	237.45	25.94	238.86	160.90	80.82
250	16°15′	20°18.75′	124.48	7.35	246.88	29.28	248.61	167.78	84.34
260	16°54′	21°58.20′	129.37	8.26	256.20	32.88	258.30	174.69	87.90
270	17°33′	23°41.55′	134.23	9.25	265.42	36.76	267.95	181.64	91.49
280	18°12′	25°28.80′	139.08	10.30	274.51	40.92	277.55	188.64	95.13
290	18°51′	27°19.95′	143.91	11.44	283.47	45.37	287.08	195.69	98.81
300	19°30′	29°15.00′	148.71	12.64	292.28	50.11	296.54	202.80	102.55
310	20°09′	31°13.95′	153.48	13.93	300.91	55.14	305.93	209.98	106.35
320	20°48′	33°16.80′	158.22	15.30	309.37	60.48	315.23	217.23	110.22
330	21°27′	35°23.55′	162.92	16.76	317.63	66.12	324.44	224.56	114.16
340	22°06′	37°34.20′	167.59	18.30	325.67	72.06	333.55	231.99	118.19
350	22°45′	39°48.75′	172.22	19.92	333.47	78.31	342.55	239.52	122.31
360	23°24′	42°07.20′	176.81	21.63	341.03	84.87	351.43	247.17	126.54
370	24°03′	44°29.55′	181.34	23.43	348.30	91.73	360.18	254.94	130.89
380	24°42′	46°55.80′	185.83	25.32	355.29	98.88	368.79	262.85	135.36
390	25°21′	49°25.95′	190.26	27.31	361.95	106.33	377.25	270.92	139.98
400	26°00′	52°00.00′	194.63	29.38	368.29	114.07	385.55	279.16	144.76
410	26°39′	54°37.95′	198.94	31.54	374.26	122.09	393.67	287.60	149.72
420	27°18′	57°19.80′	203.18	33.79	379.85	130.38	401.61	296.25	154.88
430	27°57′	60°05.55′	207.35	36.14	385.05	138.92	409.34	305.14	160.27
440	28°36′	62°55.20′	211.45	38.58	389.82	147.71	416.87	314.30	165.90
450	29°15′	65°48.75′	215.46	41.10	394.15	156.73	424.16	323.75	171.81
460	29°54′	68°46.20′	219.39	43.71	398.01	165.95	431.22	333.54	178.03
470	30°33′	71°47.55′	223.22	46.41	401.38	175.36	438.02	343.70	184.60
480	31°12′	74°52.80′	226.97	49.20	404.25	184.94	444.54	354.28	191.57
490	31°51′	78°01.95′	230.61	52.07	406.59	194.66	450.79	365.33	198.98
500	32°30′	81°15.00′	234.15	55.02	408.39	204.50	456.73	376.92	206.90

TABLE V, THE STANDARD HIGHWAY SPIRAL

a = 6.5—Continued

L	D	S	q	p	X	Y	C	U	V
510	33°09′	84°31.95′	237.58	58.05	409.63	214.42	462.35	389.11	215.40
520	33°48′	87°52.80′	240.89	61.15	410.29	224.39	467.64	401.98	224.56
530	34°27′	91°17.55′	244.09	64.32	410.36	234.39	472.59	415.65	234.45
540	35°06′	94°46.20′	247.17	67.57	409.84	244.38	477.16	430.23	245.23
550	35°45′	98°18.75′	250.11	70.87	408.70	254.31	481.36	445.86	257.01
560	36°24′	101°55.20′	252.93	74.24	406.94	264.15	485.16	462.71	269.97

TABLE V, THE STANDARD HIGHWAY SPIRAL

$a = 7.0$

L	D	S	q	p	X	Y	C	U	V
10	0°42′	0°02.10′	5.00	0.00	10.00	0.00	10.00	6.67	3.33
20	1°24′	0°08.40′	10.00	0.00	20.00	0.02	20.00	13.33	6.67
30	2°06′	0°18.90′	15.00	0.01	30.00	0.05	30.00	20.00	10.00
40	2°48′	0°33.60′	20.00	0.03	40.00	0.13	40.00	26.67	13.33
50	3°30′	0°52.50′	25.00	0.06	50.00	0.25	50.00	33.33	16.67
60	4°12′	1°15.60′	30.00	0.11	60.00	0.44	60.00	40.00	20.00
70	4°54′	1°42.90′	35.00	0.17	69.99	0.70	70.00	46.67	23.34
80	5°36′	2°14.40′	40.00	0.26	79.99	1.04	79.99	53.34	26.67
90	6°18′	2°50.10′	45.00	0.37	89.98	1.48	89.99	60.01	30.01
100	7°00′	3°30.00′	49.99	0.51	99.96	2.04	99.98	66.68	33.35
110	7°42′	4°14.10′	54.99	0.68	109.94	2.71	109.97	73.35	36.69
120	8°24′	5°02.40′	59.98	0.88	119.91	3.52	119.96	80.03	40.03
130	9°06′	5°54.90′	64.98	1.12	129.86	4.47	129.94	86.72	43.38
140	9°48′	6°51.60′	69.97	1.40	139.80	5.58	139.91	93.40	46.73
150	10°30′	7°52.50′	74.95	1.72	149.72	6.86	149.87	100.10	50.09
160	11°12′	8°57.60′	79.93	2.08	159.61	8.33	159.83	106.80	53.46
170	11°54′	10°06.90′	84.91	2.50	169.47	9.98	169.76	113.52	56.84
180	12°36′	11°20.40′	89.88	2.96	179.30	11.84	179.69	120.25	60.22
190	13°18′	12°38.10′	94.85	3.49	189.08	13.92	189.59	126.99	63.63
200	14°00′	14°00.00′	99.80	4.06	198.81	16.22	199.47	133.75	67.05
210	14°42′	15°26.10′	104.75	4.70	208.48	18.76	209.32	140.54	70.49
220	15°24′	16°56.40′	109.68	5.40	218.08	21.55	219.15	147.34	73.95
230	16°06′	18°30.90′	114.60	6.17	227.61	24.59	228.93	154.18	77.44
240	16°48′	20°09.60′	119.51	7.01	237.05	27.90	238.68	161.05	80.96
250	17°30′	21°52.50′	124.40	7.91	246.38	31.49	248.38	167.96	84.51
260	18°12′	23°39.60′	129.26	8.89	255.60	35.35	258.03	174.91	88.10
270	18°54′	25°30.90′	134.11	9.95	264.69	39.51	267.63	181.91	91.74
280	19°36′	27°26.40′	138.94	11.08	273.65	43.97	277.16	188.96	95.42
290	20°18′	29°26.10′	143.73	12.30	282.44	48.73	286.61	196.08	99.16
300	21°00′	31°30.00′	148.50	13.60	291.06	53.80	295.99	203.26	102.97
310	21°42′	33°38.10′	153.24	14.98	299.49	59.18	305.28	210.52	106.85
320	22°24′	35°50.40′	157.94	16.45	307.70	64.88	314.47	217.88	110.81
330	23°06′	38°06.90′	162.60	18.01	315.69	70.89	323.56	225.33	114.86
340	23°48′	40°27.60′	167.21	19.66	323.43	77.23	332.52	232.88	119.01
350	24°30′	42°52.50′	171.78	21.39	330.90	83.87	341.37	240.57	123.27
360	25°12′	45°21.60′	176.30	23.23	338.08	90.83	350.07	248.38	127.66
370	25°54′	47°54.90′	180.77	25.15	344.95	98.10	358.63	256.35	132.19
380	26°36′	50°32.40′	185.18	27.17	351.48	105.67	367.02	264.49	136.87
390	27°18′	53°14.10′	189.52	29.28	357.65	113.54	375.24	272.82	141.73
400	28°00′	56°00.00′	193.80	31.49	363.44	121.69	383.27	281.36	146.79
410	28°42′	58°50.10′	198.00	33.79	368.83	130.12	391.11	290.13	152.06
420	29°24′	61°44.40′	202.13	36.19	373.78	138.80	398.72	299.17	157.58
430	30°06′	64°42.90′	206.17	38.68	378.29	147.73	406.11	308.51	163.38
440	30°48′	67°45.60′	210.13	41.26	382.32	156.88	413.25	318.17	169.49
450	31°30′	70°52.50′	214.00	43.93	385.85	166.23	420.14	328.21	175.94
460	32°12′	74°03.60′	217.77	46.70	388.86	175.77	426.74	338.66	182.79
470	32°54′	77°18.90′	221.44	49.54	391.34	185.45	433.06	349.59	190.09
480	33°36′	80°38.40′	225.00	52.48	393.25	195.27	439.06	361.06	197.90
490	34°18′	84°02.10′	228.45	55.49	394.56	205.18	444.74	373.15	206.29
500	35°00′	87°30.00′	231.78	58.59	396.32	215.15	450.08	385.93	215.35

TABLE V, THE STANDARD HIGHWAY SPIRAL

a = 7.0—Continued

L	D	S	q	p	X	Y	C	U	V
510	35°42′	91°02.10′	234.99	61.75	395.45	225.15	455.05	399.52	225.18
520	36°24′	94°38.40′	238.07	64.99	394.96	235.13	459.65	414.04	235.90
530	37°06′	98°18.90′	241.02	68.30	393.83	245.07	463.85	429.65	247.67
540	37°48′	102°03.60′	243.83	71.66	392.06	254.91	467.64	446.52	260.66

TABLE V, THE STANDARD HIGHWAY SPIRAL

$a = 8.0$

L	D	S	q	p	x	y	C	U	V
10	0°48′	0°02.40′	5.00	0.00	10.00	0.00	10.00	6.67	3.33
20	1°36′	0°09.60′	10.00	0.00	20.00	0.02	20.00	13.33	6.67
30	2°24′	0°21.60′	15.00	0.02	30.00	0.06	30.00	20.00	10.00
40	3°12′	0°38.40′	20.00	0.04	40.00	0.15	40.00	26.67	13.33
50	4°00′	1°00.00′	25.00	0.07	50.00	0.29	50.00	33.33	16.67
60	4°48′	1°26.40′	30.00	0.13	60.00	0.50	60.00	40.00	20.00
70	5°36′	1°57.60′	35.00	0.20	69.99	0.80	70.00	46.67	23.34
80	6°24′	2°33.60′	40.00	0.30	79.98	1.19	79.99	53.34	26.67
90	7°12′	3°14.40′	45.00	0.42	89.97	1.70	89.99	60.01	30.01
100	8°00′	4°00.00′	49.99	0.58	99.95	2.33	99.98	66.68	33.35
110	8°48′	4°50.40′	54.99	0.77	109.92	3.10	109.97	73.36	36.69
120	9°36′	5°45.60′	59.98	1.00	119.88	4.02	119.95	80.04	40.04
130	10°24′	6°45.60′	64.97	1.28	129.82	5.11	129.92	86.73	43.39
140	11°12′	7°50.40′	69.96	1.60	139.74	6.38	139.88	93.43	46.75
150	12°00′	9°00.00′	74.94	1.96	149.63	7.84	149.84	100.13	50.12
160	12°48′	10°14.40′	79.91	2.38	159.49	9.51	159.77	106.85	53.50
170	13°36′	11°33.60′	84.88	2.85	169.31	11.40	169.69	113.58	56.89
180	14°24′	12°57.60′	89.85	3.39	179.08	13.52	179.59	120.32	60.29
190	15°12′	14°26.40′	94.80	3.98	188.80	15.89	189.46	127.09	63.72
200	16°00′	16°00.00′	99.74	4.64	198.45	18.51	199.31	133.88	67.17
210	16°48′	17°38.40′	104.67	5.37	208.02	21.41	209.12	140.70	70.64
220	17°36′	19°21.60′	109.58	6.17	217.50	24.58	218.89	147.55	74.14
230	18°24′	21°09.60′	114.48	7.04	226.88	28.04	228.61	154.44	77.68
240	19°12′	23°02.40′	119.36	8.00	236.15	31.80	238.28	161.38	81.25
250	20°00′	25°00.00′	124.21	9.03	245.28	35.87	247.89	168.36	84.87
260	20°48′	27°02.40′	129.04	10.14	254.27	40.26	257.44	175.40	88.55
270	21°36′	29°09.60′	133.84	11.35	263.09	44.96	266.90	182.50	92.28
280	22°24′	31°21.60′	138.61	12.64	271.73	50.00	276.29	189.68	96.08
290	23°12′	33°38.40′	143.35	14.02	280.16	55.37	285.58	196.94	99.96
300	24°00′	36°00.00′	148.05	15.49	288.37	61.08	294.77	204.30	103.92
310	24°48′	38°26.40′	152.70	17.06	296.33	67.13	303.84	211.76	107.98
320	25°36′	40°57.60′	157.31	18.72	304.03	73.52	312.79	219.34	112.15
330	26°24′	43°33.60′	161.87	20.48	311.43	80.24	321.60	227.05	116.44
340	27°12′	46°14.40′	166.38	22.34	318.51	87.30	330.26	234.92	120.87
350	28°00′	49°00.00′	170.82	24.30	325.25	94.68	338.75	242.95	125.45
360	28°48′	51°50.40′	175.20	26.36	331.63	102.39	347.07	251.17	130.22
370	29°36′	54°45.60′	179.51	28.53	337.60	110.40	355.20	259.61	135.18
380	30°24′	57°45.60′	183.74	30.79	343.16	118.72	363.11	268.28	140.36
390	31°12′	60°50.40′	187.90	33.15	348.26	127.31	370.80	277.23	145.79
400	32°00′	64°00.00′	191.96	35.62	352.89	136.18	378.26	286.47	151.51
410	32°48′	67°14.40′	195.94	38.18	357.02	145.28	385.45	296.07	157.55
420	33°36′	70°33.60′	199.82	40.84	360.62	154.61	392.37	306.05	163.96
430	34°24′	73°57.60′	203.60	43.60	363.67	164.13	398.99	316.48	170.78
440	35°12′	77°26.40′	207.26	46.45	366.14	173.82	405.31	327.41	178.08
450	36°00′	81°00.00′	210.82	49.39	368.01	183.64	411.29	338.92	185.93
460	36°48′	84°38.40′	214.25	52.41	369.26	193.56	416.92	351.10	194.41
470	37°36′	88°21.60′	217.55	55.52	369.87	203.54	422.18	364.05	203.63
480	38°24′	92°09.60′	220.73	58.71	369.83	213.54	427.05	377.88	213.69
490	39°12′	96°02.40′	223.76	61.97	369.12	223.51	431.51	392.77	224.76
500	40°00′	100°00.00′	226.66	65.30	367.72	233.41	435.55	408.88	237.02

TABLE V, THE STANDARD HIGHWAY SPIRAL

a = 9.0

L	D	S	q	p	X	Y	C	U	V
10	0°54′	0°02.70′	5.00	0.00	10.00	0.00	10.00	6.67	3.33
20	1°48′	0°10.80′	10.00	0.01	20.00	0.02	20.00	13.33	6.67
30	2°42′	0°24.30′	15.00	0.02	30.00	0.07	30.00	20.00	10.00
40	3°36′	0°43.20′	20.00	0.04	40.00	0.17	40.00	26.67	13.33
50	4°30′	1°07.50′	25.00	0.08	50.00	0.33	50.00	33.33	16.67
60	5°24′	1°37.20′	30.00	0.14	60.00	0.57	60.00	40.00	20.00
70	6°18′	2°12.30′	35.00	0.22	69.99	0.90	70.00	46.67	23.34
80	7°12′	2°52.80′	40.00	0.34	79.98	1.34	79.99	53.34	26.67
90	8°06′	3°38.70′	44.99	0.48	89.96	1.91	89.98	60.01	30.01
100	9°00′	4°30.00′	49.99	0.65	99.94	2.62	99.97	66.69	33.35
110	9°54′	5°26.70′	54.98	0.87	109.90	3.48	109.96	73.37	36.70
120	10°48′	6°28.80′	59.97	1.13	119.85	4.52	119.93	80.05	40.05
130	11°42′	7°36.30′	64.96	1.44	129.77	5.74	129.90	86.75	43.41
140	12°36′	8°49.20′	69.94	1.79	139.67	7.17	139.85	93.45	46.77
150	13°30′	10°07.50′	74.92	2.21	149.53	8.82	149.79	100.16	50.15
160	14°24′	11°31.20′	79.89	2.68	159.35	10.69	159.71	106.89	53.54
170	15°18′	13°00.30′	84.85	3.21	169.13	12.81	169.61	113.64	56.95
180	16°12′	14°34.80′	89.81	3.81	178.84	15.20	179.48	120.41	60.37
190	17°06′	16°14.70′	94.75	4.48	188.48	17.85	189.32	127.20	63.82
200	18°00′	18°00.00′	99.67	5.22	198.04	20.80	199.12	134.03	67.30
210	18°54′	19°50.70′	104.58	6.04	207.49	24.04	208.88	140.89	70.81
220	19°48′	21°46.80′	109.47	6.93	216.84	27.59	218.59	147.79	74.36
230	20°42′	23°48.30′	114.34	7.91	226.06	31.46	228.24	154.74	77.95
240	21°36′	25°55.20′	119.19	8.98	235.13	35.67	237.82	161.75	81.59
250	22°30′	28°07.50′	124.00	10.14	244.04	40.21	247.33	168.82	85.29
260	23°24′	30°25.20′	128.79	11.39	252.77	45.10	256.76	175.96	89.06
270	24°18′	32°48.30′	133.54	12.73	261.28	50.34	266.09	183.19	92.91
280	25°12′	35°16.80′	138.25	14.17	269.57	55.93	275.31	190.51	96.84
290	26°06′	37°50.70′	142.92	15.72	277.60	61.89	284.42	197.94	100.87
300	27°00′	40°30.00′	147.54	17.36	285.35	68.20	293.39	205.50	105.02
310	27°54′	43°14.70′	152.10	19.11	292.80	74.88	302.22	213.19	109.29
320	28°48′	46°04.80′	156.61	20.96	299.91	81.90	310.90	221.04	113.71
330	29°42′	49°00.30′	161.06	22.92	306.66	89.28	319.40	229.07	118.29
340	30°36′	52°01.20′	165.43	24.98	313.02	97.00	327.71	237.30	123.06
350	31°30′	55°07.50′	169.74	27.15	318.96	105.04	335.81	245.75	128.03
360	32°24′	58°19.20′	173.96	29.43	324.45	113.40	343.69	254.47	133.25
370	33°18′	61°36.30′	178.10	31.82	329.45	122.05	351.34	263.47	138.75
380	34°12′	64°58.80′	182.14	34.31	333.95	130.98	358.72	272.81	144.55
390	35°06′	68°26.70′	186.08	36.90	337.90	140.17	365.82	282.53	150.71
400	36°00′	72°00.00′	189.92	39.60	341.29	149.58	372.63	292.69	157.27
410	36°54′	75°38.70′	193.65	42.40	344.07	159.18	379.11	303.34	164.31
420	37°48′	79°22.80′	197.26	45.30	346.24	168.94	385.25	314.56	171.88
430	38°42′	83°12.30′	200.74	48.29	347.75	178.82	391.04	326.45	180.09
440	39°36′	87°07.20′	204.09	51.37	348.60	188.78	396.43	339.10	189.02
450	40°30′	91°07.50′	207.31	54.53	348.75	198.78	401.42	352.66	198.82
460	41°24′	95°13.20′	210.38	57.78	348.20	208.76	405.99	367.27	209.63
470	42°18′	99°24.30′	213.30	61.10	346.93	218.68	410.10	383.15	221.66
480	43°12′	103°40.80′	216.06	64.48	344.93	228.48	413.74	400.54	235.15

TABLE V, THE STANDARD HIGHWAY SPIRAL

a = 10.0

L	D	S	q	p	X	Y	C	U	V
10	1°00′	0°03.00′	5.00	0.00	10.00	0.00	10.00	6.67	3.33
20	2°00′	0°12.00′	10.00	0.01	20.00	0.02	20.00	13.33	6.67
30	3°00′	0°27.00′	15.00	0.02	30.00	0.08	30.00	20.00	10.00
40	4°00′	0°48.00′	20.00	0.05	40.00	0.19	40.00	26.67	13.33
50	5°00′	1°15.00′	25.00	0.09	50.00	0.36	50.00	33.33	16.67
60	6°00′	1°48.00′	30.00	0.16	59.99	0.63	60.00	40.00	20.00
70	7°00′	2°27.00′	35.00	0.25	69.99	1.00	69.99	46.67	23.34
80	8°00′	3°12.00′	40.00	0.37	79.98	1.49	79.99	53.34	26.67
90	9°00′	4°03.00′	44.99	0.53	89.96	2.12	89.98	60.02	30.01
100	10°00′	5°00.00′	49.99	0.73	99.92	2.91	99.97	66.69	33.36
110	11°00′	6°03.00′	54.98	0.97	109.88	3.87	109.95	73.38	36.71
120	12°00′	7°12.00′	59.97	1.26	119.81	5.02	119.92	80.07	40.06
130	13°00′	8°27.00′	64.95	1.60	129.72	6.38	129.87	86.77	43.42
140	14°00′	9°48.00′	69.93	1.99	139.59	7.97	139.82	93.48	46.80
150	15°00′	11°15.00′	74.90	2.45	149.42	9.79	149.74	100.20	50.18
160	16°00′	12°48.00′	79.87	2.97	159.20	11.87	159.65	106.95	53.59
170	17°00′	14°27.00′	84.82	3.56	168.92	14.23	169.52	113.71	57.01
180	18°00′	16°12.00′	89.76	4.23	178.57	16.87	179.36	120.51	60.46
190	19°00′	18°03.00′	94.69	4.97	188.12	19.81	189.16	127.33	63.94
200	20°00′	20°00.00′	99.60	5.79	197.58	23.07	198.92	134.19	67.45
210	21°00′	22°03.00′	104.48	6.70	206.91	26.66	208.62	141.10	71.00
220	22°00′	24°12.00′	109.35	7.69	216.11	30.58	218.26	148.06	74.60
230	23°00′	26°27.00′	114.19	8.78	225.15	34.86	227.83	155.08	78.26
240	24°00′	28°48.00′	119.00	9.96	234.01	39.49	237.32	162.17	81.98
250	25°00′	31°15.00′	123.77	11.24	242.66	44.49	246.71	169.34	85.77
260	26°00′	33°48.00′	128.51	12.62	251.10	49.87	256.00	176.60	89.65
270	27°00′	36°27.00′	133.20	14.11	259.28	55.62	265.17	183.97	93.62
280	28°00′	39°12.00′	137.84	15.70	267.17	61.75	274.22	191.46	97.70
290	29°00′	42°03.00′	142.44	17.40	274.76	68.26	283.12	199.09	101.92
300	30°00′	45°00.00′	146.97	19.21	282.02	75.15	291.86	206.87	106.27
310	31°00′	48°03.00′	151.44	21.13	288.90	82.40	300.42	214.83	110.79
320	32°00′	51°12.00′	155.83	23.16	295.37	90.02	308.79	223.00	115.51
330	33°00′	54°27.00′	160.16	25.31	301.42	97.98	316.94	231.40	120.43
340	34°00′	57°48.00′	164.39	27.57	306.99	106.28	324.87	240.06	125.60
350	35°00′	61°15.00′	168.54	29.94	312.06	114.90	332.54	249.03	131.06
360	36°00′	64°48.00′	172.59	32.42	316.60	123.81	339.95	258.34	136.83
370	37°00′	68°27.00′	176.54	35.01	320.57	132.99	347.06	268.05	142.98
380	38°00′	72°12.00′	180.38	37.72	323.94	142.40	353.85	278.22	149.56
390	39°00′	76°03.00′	184.09	40.52	326.67	152.02	360.31	288.91	156.64
400	40°00′	80°00.00′	187.68	43.43	328.75	161.80	366.41	300.22	164.29
410	41°00′	84°03.00′	191.14	46.44	330.14	171.70	372.12	312.24	172.63
420	42°00′	88°12.00′	194.46	49.54	330.81	181.67	377.42	325.10	181.76
430	43°00′	92°27.00′	197.63	52.73	330.76	191.67	382.28	338.96	191.85
440	44°00′	96°48.00′	200.65	56.00	329.95	201.64	386.69	354.00	203.07
450	45°00′	101°15.00′	203.51	59.35	328.39	211.51	390.61	370.46	215.65

TABLE V, THE STANDARD HIGHWAY SPIRAL

$a = 12.5$

L	D	S	q	p	X	Y	C	U	V
10	1°15′	0°03.75′	5.00	0.00	10.00	0.00	10.00	6.67	3.33
20	2°30′	0°15.00′	10.00	0.01	20.00	0.03	20.00	13.33	6.67
30	3°45′	0°33.75′	15.00	0.02	30.00	0.10	30.00	20.00	10.00
40	5°00′	1°00.00′	20.00	0.06	40.00	0.23	40.00	26.67	13.33
50	6°15′	1°33.75′	25.00	0.11	50.00	0.45	50.00	33.33	16.67
60	7°30′	2°15.00′	30.00	0.20	59.99	0.79	60.00	40.00	20.00
70	8°45′	3°03.75′	35.00	0.31	69.98	1.25	69.99	46.67	23.34
80	10°00′	4°00.00′	39.99	0.47	79.96	1.86	79.98	53.35	26.68
90	11°15′	5°03.75′	44.99	0.66	89.93	2.65	89.97	60.02	30.02
100	12°30′	6°15.00′	49.98	0.91	99.88	3.63	99.95	66.71	33.37
110	13°45′	7°33.75′	54.97	1.21	109.81	4.83	109.91	73.40	36.73
120	15°00′	9°00.00′	59.95	1.57	119.70	6.27	119.87	80.10	40.09
130	16°15′	10°33.75′	64.93	1.99	129.56	7.97	129.80	86.82	43.47
140	17°30′	12°15.00′	69.89	2.49	139.36	9.94	139.72	93.56	46.87
150	18°45′	14°03.75′	74.85	3.06	149.10	12.22	149.60	100.32	50.29
160	20°00′	16°00.00′	79.79	3.71	158.76	14.81	159.45	107.11	53.73
170	21°15′	18°03.75′	84.72	4.45	168.32	17.74	169.25	113.93	57.21
180	22°30′	20°15.00′	89.63	5.28	177.76	21.02	179.00	120.79	60.72
190	23°45′	22°33.75′	94.51	6.20	187.07	24.67	188.69	127.71	64.28
200	25°00′	25°00.00′	99.37	7.22	196.23	28.70	198.31	134.69	67.90
210	26°15′	27°33.75′	104.20	8.35	205.19	33.12	207.85	141.74	71.58
220	27°30′	30°15.00′	108.99	9.58	213.95	37.95	217.29	148.87	75.34
230	28°45′	33°03.75′	113.74	10.93	222.46	43.20	226.61	156.10	79.18
240	30°00′	36°00.00′	118.44	12.39	230.70	48.87	235.82	163.44	83.14
250	31°15′	39°03.75′	123.09	13.97	238.63	54.96	244.87	170.91	87.21
260	32°30′	42°15.00′	127.68	15.67	246.21	61.47	253.77	178.54	91.42
270	33°45′	45°33.75′	132.20	17.49	253.42	68.40	262.49	186.35	95.80
280	35°00′	49°00.00′	36.66	19.44	260.20	75.75	271.00	194.36	100.36
290	36°15′	52°33.75′	141.03	21.52	266.53	83.49	279.30	202.61	105.15
300	37°30′	56°15.00′	145.31	23.72	272.35	91.62	287.34	211.13	110.19
310	38°45′	60°03.75′	149.49	26.04	277.62	100.11	295.12	219.97	115.53
320	40°00′	64°00.00′	153.57	28.49	282.31	108.94	302.60	229.18	121.21
330	41°15′	68°03.75′	157.54	31.07	286.38	118.08	309.76	238.82	127.29
340	42°30′	72°15.00′	161.38	33.77	289.77	127.48	316.57	248.97	133.85
350	43°45′	76°33.75′	165.09	36.58	292.46	137.11	323.01	259.70	140.97
360	45°00′	81°00.00′	168.65	39.51	294.41	146.92	329.03	271.14	148.75
370	46°15′	85°33.75′	172.07	42.55	295.58	156.84	334.62	283.41	157.32
380	47°30′	90°15.00′	175.33	45.69	295.95	166.83	339.73	296.68	166.84
390	48°45′	95°03.75′	178.41	48.92	295.49	176.82	344.35	311.15	177.51
400	50°00′	100°00.00′	181.33	52.24	294.18	186.73	348.44	327.10	189.61

TABLE V, THE STANDARD HIGHWAY SPIRAL

a = 15.0

L	D	S	q	p	X	Y	C	U	V
10	1°30′	0°04.50′	5.00	0.00	10.00	0.00	10.00	6.67	3.33
20	3°00′	0°18.00′	10.00	0.01	20.00	0.03	20.00	13.33	6.67
30	4°30′	0°40.50′	15.00	0.03	30.00	0.12	30.00	20.00	10.00
40	6°00′	1°12.00′	20.00	0.07	40.00	0.28	40.00	26.67	13.33
50	7°30′	1°52.50′	25.00	0.14	49.99	0.55	50.00	33.34	16.67
60	9°00′	2°42.00′	30.00	0.24	59.99	0.94	59.99	40.00	20.00
70	10°30′	3°40.50′	35.00	0.37	69.97	1.50	69.99	46.68	23.34
80	12°00′	4°48.00′	39.99	0.56	79.94	2.23	79.98	53.35	26.68
90	13°30′	6°04.50′	44.98	0.79	89.90	3.18	89.96	60.04	30.03
100	15°00′	7°30.00′	49.97	1.09	99.83	4.36	99.92	66.73	33.39
110	16°30′	9°04.50′	54.95	1.45	109.72	5.80	109.88	73.43	36.75
120	18°00′	10°48.00′	59.93	1.88	119.57	7.52	119.81	80.15	40.14
130	19°30′	12°40.50′	64.89	2.39	129.37	9.55	129.72	86.89	43.54
140	21°00′	14°42.00′	69.85	2.99	139.08	11.92	139.59	93.66	46.96
150	22°30′	16°52.50′	74.78	3.67	148.70	14.64	149.42	100.46	50.42
160	24°00′	19°12.00′	79.70	4.45	158.21	17.73	159.20	107.30	53.91
170	25°30′	21°40.50′	84.60	5.33	167.58	21.22	168.92	114.19	57.45
180	27°00′	24°18.00′	89.46	6.32	176.79	25.12	178.57	121.15	61.05
190	28°30′	27°04.50′	94.30	7.42	185.80	29.45	188.12	128.18	64.71
200	30°00′	30°00.00′	99.09	8.64	194.59	34.23	197.57	135.30	68.46
210	31°30′	33°04.50′	103.84	9.98	203.11	39.46	206.91	142.52	72.30
220	33°00′	36°18.00′	108.54	11.45	211.33	45.15	216.10	149.87	76.26
230	34°30′	39°40.50′	113.19	13.05	219.21	51.30	225.14	157.37	80.35
240	36°00′	43°12.00′	117.76	14.78	226.71	57.91	233.99	165.04	84.60
250	37°30′	46°52.50′	122.26	16.64	233.78	64.99	242.64	172.91	89.04
260	39°00′	50°42.00′	126.68	18.65	240.37	72.51	251.06	181.02	93.70
270	40°30′	54°40.50′	131.00	20.79	246.43	80.46	259.23	189.41	98.61
280	42°00′	58°48.00′	135.23	23.07	251.91	88.82	267.11	198.13	103.83
290	43°30′	63°04.50′	139.34	25.48	256.77	97.55	274.68	207.23	109.41
300	45°00′	67°30.00′	143.32	28.03	260.95	106.63	281.90	216.78	115.42
310	46°30′	72°04.50′	147.17	30.72	264.41	116.01	288.74	226.88	121.93
320	48°00′	76°48.00′	150.88	33.54	267.09	125.64	295.17	237.62	129.05
330	49°30′	81°40.50′	154.43	36.48	268.96	135.47	301.15	249.14	136.91
340	51°00′	86°42.00′	157.82	39.53	269.98	145.41	306.65	261.59	145.65
350	52°30′	91°52.50′	161.03	42.70	270.10	155.41	311.62	275.19	155.49
360	54°00′	97°12.00′	164.05	45.97	269.32	165.37	316.04	290.21	166.69
370	55°30′	102°40.50′	166.87	49.33	267.59	175.22	319.86	307.00	179.60

TABLE V, THE STANDARD HIGHWAY SPIRAL

a = 20.0

L	D	S	q	p	X	Y	C	U	V
10	2°00′	0°06.00′	5.00	0.00	10.00	0.01	10.00	6.67	3.33
20	4°00′	0°24.00′	10.00	0.01	20.00	0.05	20.00	13.33	6.67
30	6°00′	0°54.00′	15.00	0.04	30.00	0.16	30.00	20.00	10.00
40	8°00′	1°36.00′	20.00	0.09	40.00	0.37	40.00	26.67	13.33
50	10°00′	2°30.00′	25.00	0.18	49.99	0.73	50.00	33.34	16.67
60	12°00′	3°36.00′	30.00	0.31	59.98	1.26	59.99	40.01	20.01
70	14°00′	4°54.00′	34.99	0.50	69.95	1.99	69.98	46.68	23.35
80	16°00′	6°24.00′	39.98	0.74	79.90	2.98	79.96	53.37	26.70
90	18°00′	8°06.00′	44.97	1.06	89.82	4.24	89.92	60.06	30.06
100	20°00′	10°00.00′	49.95	1.45	99.70	5.81	99.86	66.77	33.43
110	22°00′	12°06.00′	54.92	1.93	109.51	7.72	109.78	73.51	36.82
120	24°00′	14°24.00′	59.87	2.51	119.24	10.01	119.66	80.27	40.24
130	26°00′	16°54.00′	64.81	3.19	128.87	12.70	129.50	87.06	43.70
140	28°00′	19°36.00′	69.73	3.97	138.37	15.83	139.27	93.91	47.19
150	30°00′	22°30.00′	74.62	4.88	147.70	19.42	148.97	100.82	50.75
160	32°00′	25°36.00′	79.47	5.92	156.84	23.49	158.58	107.80	54.37
170	34°00′	28°54.00′	84.28	7.08	165.73	28.07	168.09	114.88	58.08
180	36°00′	32°24.00′	89.05	8.39	174.33	33.16	177.45	122.07	61.89
190	38°00′	36°06.00′	93.76	9.84	182.59	38.79	186.67	129.40	65.83
200	40°00′	40°00.00′	98.40	11.44	190.47	44.95	195.70	136.90	69.92
210	42°00′	44°06.00′	102.96	13.19	197.90	51.64	204.52	144.61	74.21
220	44°00′	48°24.00′	107.43	15.10	204.81	58.86	213.10	152.55	78.71
230	46°00′	52°54.00′	111.81	17.17	211.15	66.59	221.40	160.79	83.49
240	48°00′	57°36.00′	116.07	19.40	216.85	74.80	229.39	169.38	88.59
250	50°00′	62°30.00′	120.20	21.78	221.85	83.46	237.03	178.40	94.09
260	52°00′	67°36.00′	124.20	24.33	226.07	92.53	244.27	187.93	100.08
270	54°00′	72°54.00′	128.03	27.03	229.45	101.93	251.07	198.09	106.65
280	56°00′	78°24.00′	131.70	29.88	231.93	111.62	257.39	209.02	113.94
290	58°00′	84°06.00′	135.19	32.86	233.45	121.50	263.17	220.90	122.14
300	60°00′	90°00.00′	138.48	35.98	233.97	131.48	268.38	233.97	131.48
310	62°00′	96°06.00′	141.55	39.23	233.44	141.46	272.96	248.56	142.26
320	64°00′	102°24.00′	144.40	42.58	231.84	151.32	276.85	265.11	154.94

TABLE V, THE STANDARD HIGHWAY SPIRAL

$a = 25.0$

L	D	S	q	p	X	Y	C	U	V
10	2°30′	0°07.50′	5.00	0.00	10.00	0.01	10.00	6.67	3.33
20	5°00′	0°30.00′	10.00	0.01	20.00	0.06	20.00	13.33	6.67
30	7°30′	1°07.50′	15.00	0.05	30.00	0.20	30.00	20.00	10.00
40	10°00′	2°00.00′	20.00	0.12	40.00	0.47	40.00	26.67	13.33
50	12°30′	3°07.50′	25.00	0.23	49.99	0.91	49.99	33.34	16.67
60	15°00′	4°30.00′	29.99	0.39	59.96	1.57	59.98	40.01	20.01
70	17°30′	6°07.50′	34.99	0.62	69.92	2.49	69.96	46.69	23.36
80	20°00′	8°00.00′	39.97	0.93	79.84	3.72	79.93	53.39	26.72
90	22°30′	10°07.50′	44.95	1.32	89.72	5.29	89.88	60.10	30.09
100	25°00′	12°30.00′	49.92	1.81	99.53	7.25	99.79	66.83	33.49
110	27°30′	15°07.50′	54.87	2.41	109.24	9.63	109.66	73.60	36.91
120	30°00′	18°00.00′	59.80	3.13	118.82	12.48	119.47	80.42	40.38
130	32°30′	21°07.50′	64.71	3.97	128.24	15.82	129.22	87.29	43.90
140	35°00′	24°30.00′	59.58	4.96	137.46	19.70	138.87	94.24	47.49
150	37°30′	28°07.50′	74.40	6.08	146.43	24.12	148.40	101.29	51.18
160	40°00′	32°00.00′	79.18	7.36	155.08	29.13	157.79	108.46	54.97
170	42°30′	36°07.50′	83.89	8.81	163.37	34.73	167.02	115.79	58.90
180	45°00′	40°30.00′	88.52	10.42	171.21	40.92	176.03	123.30	63.01
190	47°30′	45°07.50′	93.07	12.20	178.55	47.71	184.81	131.04	67.33
200	50°00′	50°00.00′	97.51	14.16	185.30	55.09	193.31	139.07	71.91
210	52°30′	55°07.50′	101.84	16.29	191.38	63.02	201.49	147.45	76.82
220	55°00′	60°30.00′	106.04	18.61	196.70	71.48	209.29	156.26	82.13
230	57°30′	66°07.50′	110.08	21.10	201.20	80.41	216.67	165.61	87.94
240	60°00′	72°00.00′	113.95	23.76	204.77	89.75	223.58	175.61	94.36
250	62°30′	78°07.50′	117.64	26.59	207.35	99.40	229.95	186.45	101.58
260	65°00′	84°30.00′	121.12	29.58	208.87	109.28	235.73	198.34	109.79
270	67°30′	91°07.50′	124.38	32.72	209.25	119.27	240.85	211.59	119.29
280	70°00′	98°00.00′	127.41	35.99	208.46	129.23	245.27	226.62	130.50
290	72°30′	105°07.50′	130.17	39.37	206.46	139.02	248.90	244.04	144.01