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## Test report of

## IES LM-79-08

## Approved Method: Electrical and Photometric

## Measurements of Solid-State Lighting Products

Rendered to:

**LIGHT EFFICIENT DESIGN, DIV OF TADD LLC**

188 S. Northwest Highway Cary, IL60013

For products:

LED Street Light

Models:

LED-8090M4T4

**Test date:** Mar 25, 2015 to Mar 26, 2015

**Test laboratory:** LCTECH (Zhongshan) Testing Service Co.,Ltd  
2/F.,Technology and Enterprise Development Center, Guangyuan Road,  
Xiaolan, Zhongshan, Guangdong, China

**Laboratory note:** N/A

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**Complied by:**

Lin Qiu

Test Engineer

Mar 28, 2015

**Reviewed by:**

Richard Li

Technical Manager

Mar 28, 2015

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## 1 General

### 1.1 Product Information

Brand Name	Light Efficient Design
Trade Mark	-
Luminaire Type	LED Street Light
Model Number	LED-8090M4T4
Rated Inputs	120-347VAC,50/60Hz
Rated Power	120 W
Rated Initial Lumens	8500 lm
Declared CCT	4000 K
Power Supply	Integral LED driver
LED Package, Array or Module	-
Date of Receipt Samples	Mar 23, 2015
Quantity of Receipt Samples	1 unit

#### Photo



Picture 1

## 1.2 Standards or methods

The following standards are partly or totally used or referenced for test:

No.	Name
ANSI/NEMA/ ANSLG C78.377-2011	Specifications for the Chromaticity of Solid State Lighting Products
ANSI C82.77-2002	Harmonic Emission Limits—Related Power Quality Requirements for Lighting Equipment
CIE Pub. No. 13.3-1995	Method of Measuring and Specifying Color Rendering of Light Sources
CIE Pub. No. 15:2004	Colorimetry
IES LM-79-08	Electrical and Photometric Measurements of Solid-State Lighting Products

## 1.3 Equipment list

ID	Instrument	Model name	Cal. date	Next cal. Date
AC Power supply	LC-I-923	CHP-500	2015-02-05	2016-02-04
AC Power supply	LC-I-987	APW-110N	2015-02-05	2016-02-04
Power analyzer	LC-I-928	WT210	2015-02-09	2016-02-08
Power analyzer	LC-I-954	WT210	2015-03-04	2016-03-03
Photometric colorimetric electric system (2 meter sphere)	LC-I-900	SPR3000	Before use	Before use
Standard lamp	LC-I-917	24V100W	2014-10-14	2015-10-13
Goniophotometer(with mirror)	LC-I-902	GMS2000	2014-05-14	2015-05-13
Wireless temperature transmitter	LC-I-958	DWRP-B(0)	2014-08-19	2015-08-18
Wireless temperature transmitter	LC-I-959	DWRP-B(0)	2014-08-19	2015-08-18

## 2 Test conducted and method

### 2.1 Ambient Condition

The ambient temperature in which measurements are being taken was maintained at  $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$ , the air flow around the sample(s) being tested did not affect the performance.

### 2.2 Power Supply Characteristics

The AC power supply had a sinusoidal voltage wave shape at the prescribed frequency (60 Hz) such that the RMS summation of the harmonic components does not exceed 3 percent of the fundamental during operation of the test item.

The voltage of AC power supply (RMS voltage) applied to the device under test was regulated to within  $\pm 0.2$  percent under load.

### 2.3 Seasoning and Stabilization

No seasoning was performed in accordance with IESNA LM-79-08. And before the measurement, the sample was stabilized until the light output and power variations were less than 0.5% in 30 minutes intervals (3 readings, 15 minutes apart).

### 2.4 Electrical Instrumentation

The calibration uncertainties of the instruments for AC voltage and current were less than 0.2 percent, and the calibration uncertainty of the AC power meter was less than 0.5 percent (95 % confidence interval,  $k=2$ ).

### 2.5 Color Measurement Method

Spectral radiant flux was measured by a sphere (2 meter)-spectroradiometer system, and the color characteristics (Color rendering index, correlated color temperature, chromaticity coordinate) were calculated from these by software automatically.

### 2.6 Total Luminous Flux Measurement Method

Total luminous flux was measured by both sphere-spectroradiometer system and goniophotometer.

Spectral radiant flux was measured by a sphere (2 meter)-spectroradiometer system, and the total luminous flux was calculated from these by software automatically.

Light intensity distribution was measured by a type C goniophotometer (with mirror) which can keep the sample in burn position when the tests conduct, and the total luminous flux was calculated from the intensity data by software automatically.

### 2.7 Luminous Intensity Distribution Measurement Method

Luminous intensity distribution was measured by a mirror-type goniophotometer (Type C) which can keep the sample in burn position when the tests conduct, and the kinds of graph were generated by software automatically.

### 2.8 Spatial Non-uniformity of Chromaticity

The customer did not require this measurement.

### 3 Test Result Summary

#### 3.1 Electrical data

Criteria Item	Result (Sphere)	Result (Goniophotometer)
Input Voltage	277.02 V~60Hz	276.93 V~60Hz
Input Current	0.462 A	0.464 A
Total Power	116.83 W	117.21 W
Power Factor	0.912	0.912
I-THD	19.13%	-
Off-state Power	0.0 W	-

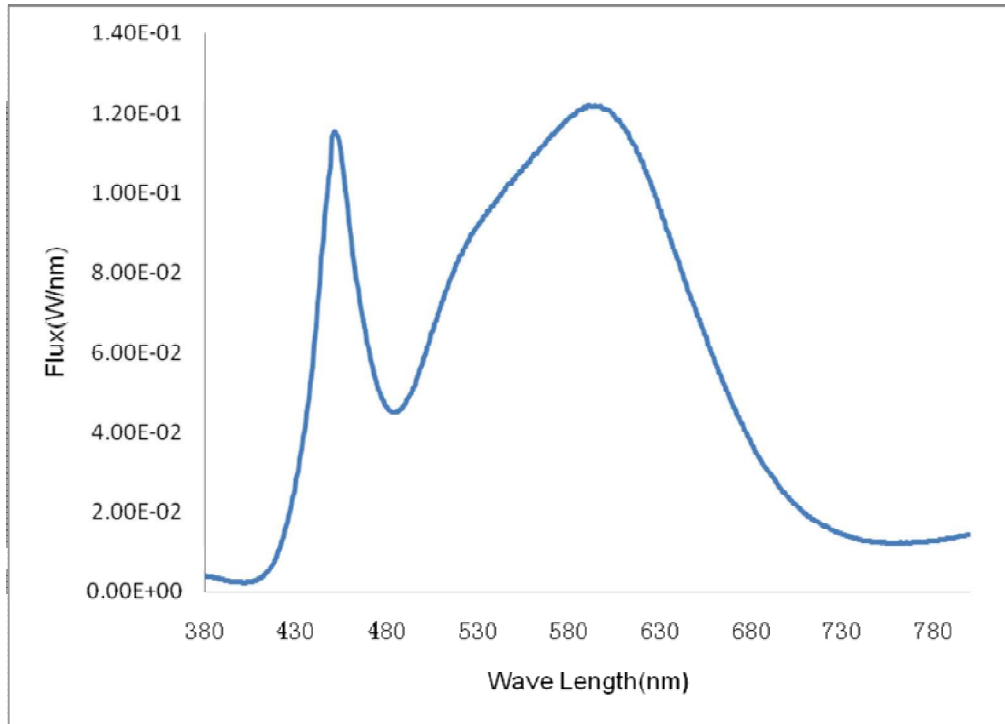
#### 3.2 Photometric data

Criteria Item	Result (Sphere)	Result (Goniophotometer)
Total Lumens	8483.56 lm	8553.57 lm
Luminaire Efficacy	72.62 lm/W	72.98 lm/W
Correlated Color Temperature (CCT)	4068 K	-
Color Rendering Index (CRI)	84.1	-
R9	18	-
Chromaticity Coordinate (x,y)	x=0.3786 y=0.3791	-
Chromaticity Coordinate (u,v)	u=0.2230 v=0.3349	-
Chromaticity Coordinate (u',v')	u'=0.223 v'=0.5023	-
Duv	0.0016	-
Zone Lumens between 0-90°	-	99.48%
Zone Lumens between 80-90°	-	2.8%

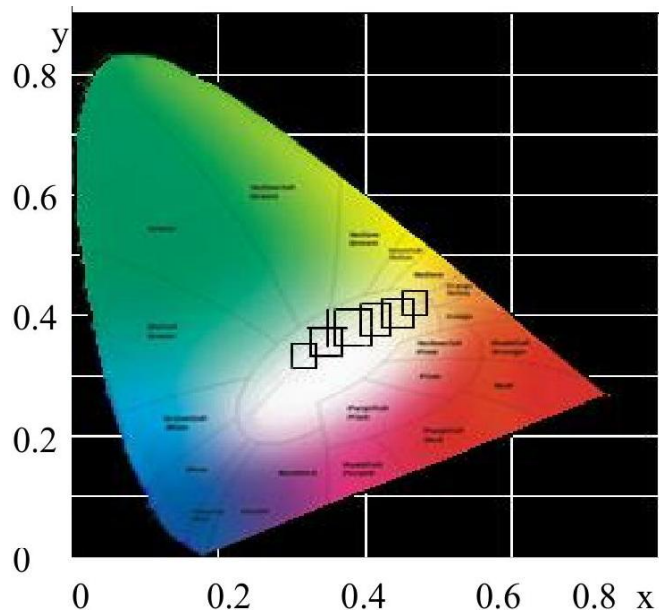
Note: N.A.

## 4 Test Data

### 4.1 Spectral Distribution

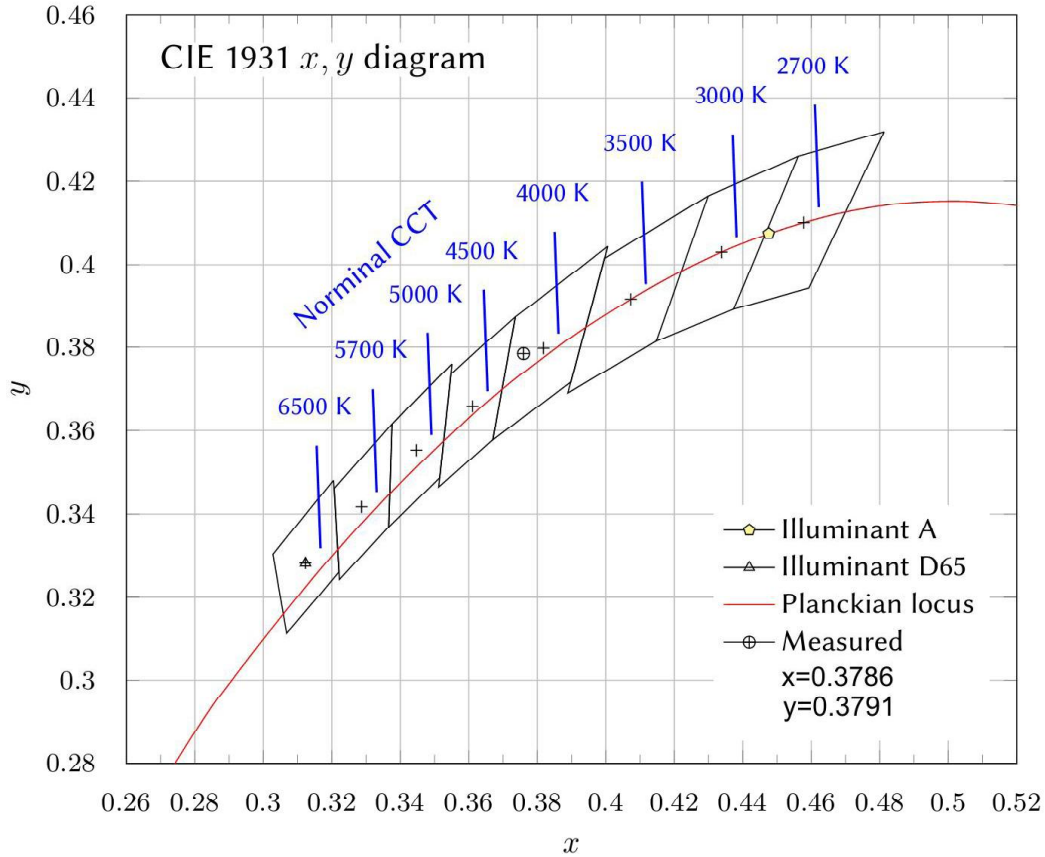


### 4.2 Chromaticity Diagram (CIE 1931)





**4.3 ANSI Chromaticity Quadrangles Diagram**



**4.4 Color Rendering Details**

R1	R2	R3	R4	R5
82	90	95	83	82
R6	R7	R8	R9	R10
85	88	68	18	75
R11	R12	R13	R14	R15
81	64	85	97	77





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**4.5 Goniometry Test Data**

IES Classification	Type IV	Cut Off Classification	Non-Cutoff
Longitudinal Classification	Very Short	Luminous Length	0.130m
Test Distance	18.70 m	Luminous Width	0.070m
		Luminous Height	0.010m

**4.6 Zonal Lumen Summary**

Zone	Lumens	%Lamp	%Fixt
0-30	1048.18	12.25%	12.25%
0-40	2110.84	24.68%	24.68%
0-60	6282.06	73.44%	73.44%
0-90	8509.01	99.48%	99.48%
90-120	34.21	0.40%	0.40%
90-130	37.33	0.44%	0.44%
90-150	41.22	0.48%	0.48%
90-180	44.56	0.52%	0.52%
0-180	8553.57	100.00%	100.00%
0-10	112.95		
10-20	343.16		
20-30	592.07		
30-40	1062.66		
40-50	2046.03		
50-60	2125.19		
60-70	1240.82		
70-80	743.25		
80-90	242.88		
90-100	26.63		
100-110	4.03		
110-120	3.55		
120-130	3.12		
130-140	2.14		
140-150	1.74		
150-160	1.59		
160-170	1.27		
170-180	0.49		



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#### 4.7 Flux Distribution



	Lumens	Percent Of Lamp
Downward Street Side	6037.6	70.6
Downward House Side	2471.5	28.9
Downward Total	8509.0	99.5
Upward Street Side	28.0	0.3
Upward House Side	16.6	0.2
Upward Total	44.6	0.5
Total Flux	8553.6	100.0

#### 4.8 Luminaire Classification System (LCS)

	Lumens	% Lamp	% Luminaire
FL - Front-Low (0-30)	575.2	6.7	6.7
FM - Front-Medium (30-60)	3701.5	43.3	43.3
FH - Front-High (60-80)	1549.3	18.1	18.1
FVH - Front-Very High (80-90)	211.5	2.5	2.5
BL - Back-Low (0-30)	473.0	5.5	5.5
BM - Back-Medium (30-60)	1532.4	17.9	17.9
BH - Back-High (60-80)	434.7	5.1	5.1
BVH - Back-Very High (80-90)	31.4	0.4	0.4
UL - Uplight-Low (90-100)	26.6	0.3	0.3
UH - Uplight-High (100-180)	17.9	0.2	0.2
Total	8553.5	100.0	100.0

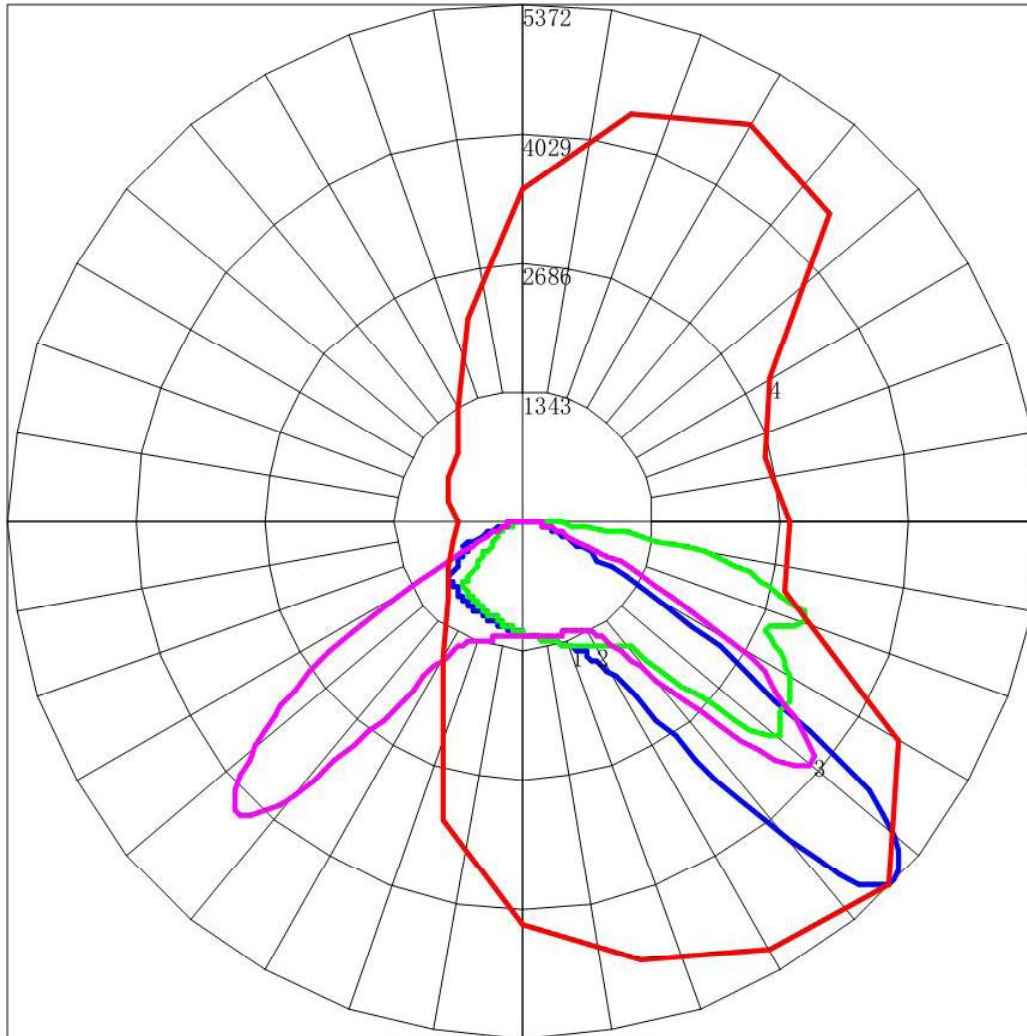


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### 4.9 Polar Curves



Ref. No. LCZP-16030810



Maximum Candela = 5372.29 Located At Horizontal Angle = 315, Vertical Angle = 46

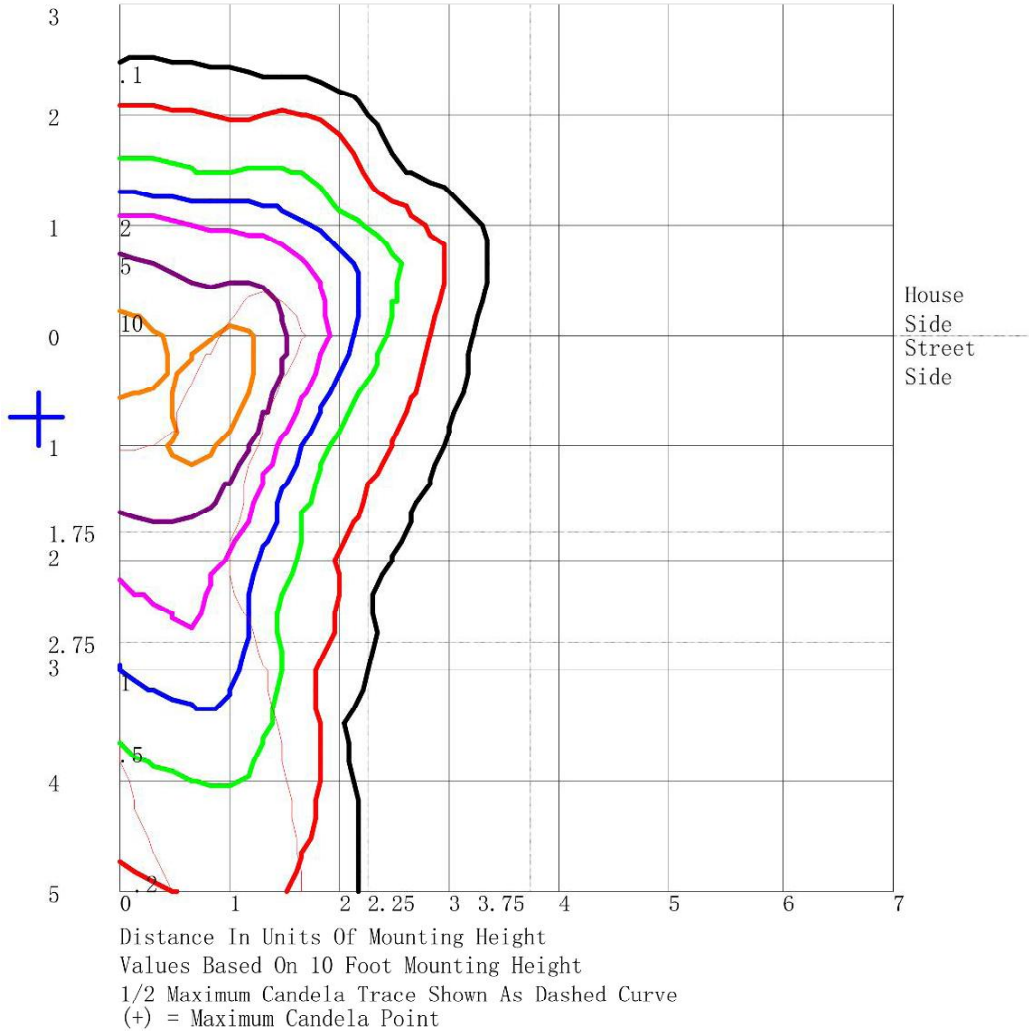
# 1 - Vertical Plane Through Horizontal Angles (315 - 135) (Through Max. Cd.)

# 2 - Vertical Plane Through Horizontal Angles (0 - 180)

# 3 - Vertical Plane Through Horizontal Angles (90 - 270)

# 4 - Horizontal Cone Through Vertical Angle (46) (Through Max. Cd.)

**4.10 ISOFOOTCANDLE Lines of Horizontal Illuminance**



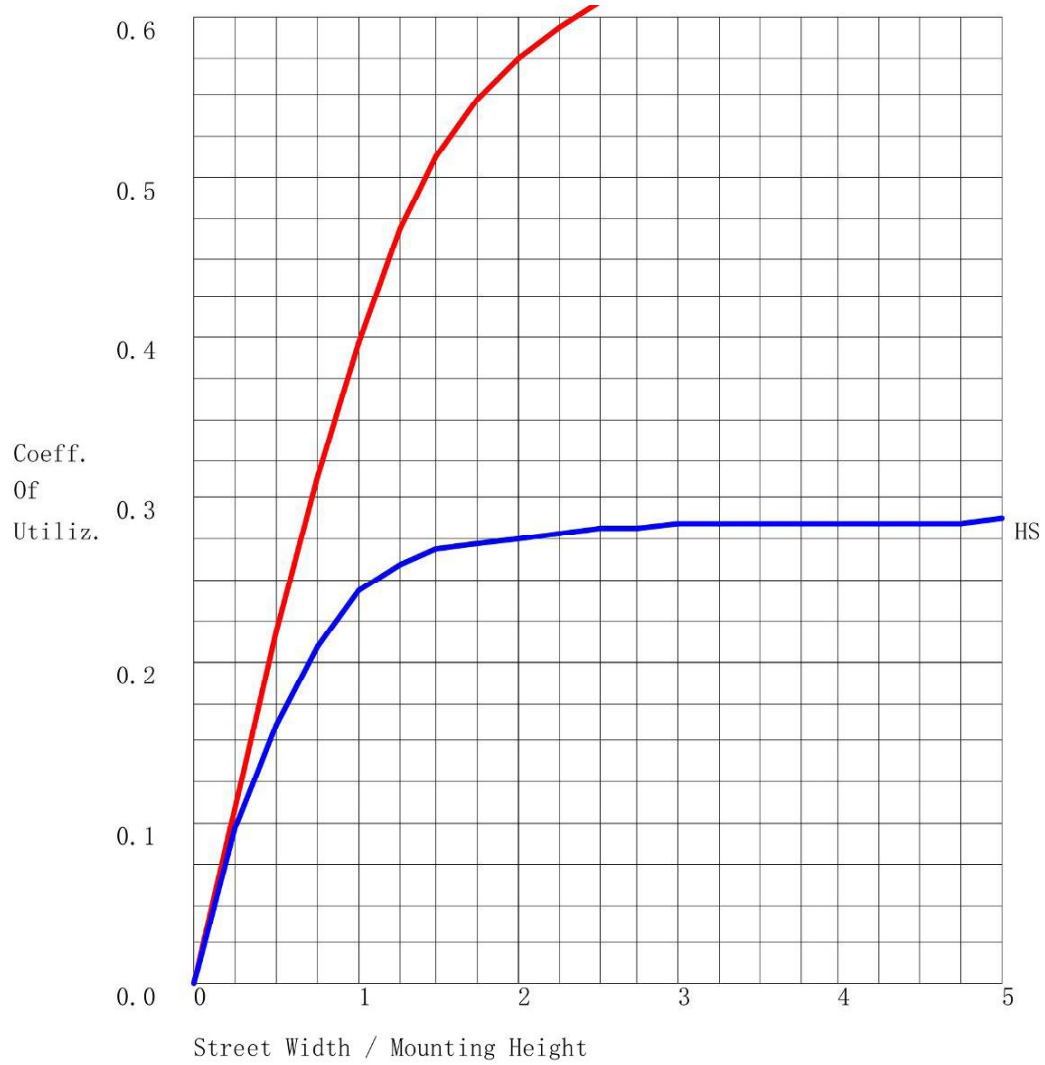


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4.11 GU Graph



Ref. No. LCZP-16030810



**4.12 Candela Tabulation**

Vert. Angles	Horizontal Angles									
	0	15	30	45	60	75	90	105	120	135
0	1174.64	1174.64	1174.64	1174.64	1174.64	1174.64	1174.64	1174.64	1174.64	1174.64
1	1177.41	1180.2	1180.55	1182.3	1183.00	1184.75	1187.55	1173.56	1166.22	1161.32
2	1184.75	1188.6	1187.2	1186.5	1185.8	1185.1	1185.1	1170.06	1160.62	1155.03
3	1193.49	1196.29	1194.54	1191.39	1189.65	1185.45	1183.35	1167.62	1157.47	1149.08
4	1202.23	1205.03	1200.84	1198.39	1193.49	1186.85	1183.00	1166.22	1153.98	1143.49
5	1209.58	1212.72	1208.53	1204.68	1198.04	1188.6	1183.00	1165.87	1150.48	1138.24
6	1219.37	1221.82	1215.87	1210.98	1203.98	1192.09	1183.7	1165.52	1147.68	1134.05
7	1228.46	1229.86	1223.57	1218.67	1208.88	1194.89	1185.1	1165.52	1144.54	1128.8
8	1237.9	1240.00	1232.66	1226.01	1215.17	1199.44	1186.85	1164.82	1142.79	1122.51
9	1249.44	1248.74	1240.7	1235.11	1222.17	1203.63	1188.25	1165.17	1140.69	1118.66
10	1260.98	1258.88	1250.49	1243.5	1227.76	1208.88	1191.04	1165.17	1139.29	1113.76
11	1270.42	1267.98	1258.53	1252.94	1234.76	1214.12	1193.49	1166.22	1138.24	1109.57
12	1280.21	1277.77	1269.03	1261.68	1241.05	1219.72	1198.04	1168.31	1136.49	1105.02
13	1291.4	1286.51	1278.12	1269.38	1248.74	1227.41	1203.28	1170.06	1136.49	1101.87
14	1300.5	1296.3	1289.31	1278.12	1257.14	1235.45	1207.83	1170.76	1135.44	1098.38
15	1311.34	1307.14	1298.4	1287.56	1266.93	1240.7	1212.72	1173.21	1134.05	1094.18
16	1321.48	1316.23	1308.54	1295.95	1274.27	1246.3	1219.02	1175.66	1132.3	1090.68
17	1330.92	1324.63	1319.03	1306.09	1282.66	1253.99	1224.27	1178.11	1131.25	1086.14
18	1340.36	1334.42	1328.47	1315.18	1290.71	1259.93	1229.86	1180.2	1130.2	1082.64
19	1351.9	1343.16	1338.26	1325.67	1299.45	1267.63	1235.81	1183.35	1130.2	1078.79
20	1362.04	1352.95	1349.1	1333.37	1307.14	1274.97	1242.45	1186.85	1129.85	1074.6
21	1374.28	1361.69	1358.2	1342.81	1316.58	1281.61	1246.99	1188.95	1129.85	1071.45
22	1384.07	1372.53	1370.43	1353.3	1324.98	1289.31	1252.59	1191.74	1129.15	1066.9
23	1395.96	1382.67	1381.97	1365.19	1335.82	1296.65	1257.14	1194.54	1127.75	1062.71
24	1406.45	1395.61	1395.61	1377.08	1347.01	1307.14	1261.68	1197.69	1126.35	1057.81
25	1419.04	1407.15	1408.55	1393.87	1363.09	1317.28	1266.23	1199.79	1124.95	1053.62
26	1428.83	1418.69	1425.34	1411.00	1381.28	1330.22	1271.47	1201.54	1123.9	1050.47
27	1442.47	1433.73	1443.17	1431.98	1405.75	1347.01	1277.77	1202.23	1122.86	1048.02
28	1453.31	1447.72	1466.6	1460.31	1430.23	1364.49	1287.91	1202.93	1120.76	1045.57
29	1466.95	1464.15	1494.58	1488.98	1466.25	1391.07	1299.1	1204.33	1118.66	1043.47
30	1480.59	1480.94	1522.2	1527.8	1510.66	1421.49	1316.93	1209.23	1115.86	1039.98
31	1492.48	1497.72	1557.17	1574.3	1559.62	1470.8	1342.11	1219.02	1112.01	1034.73
32	1506.12	1518.7	1589.34	1621.86	1616.27	1534.79	1365.54	1233.71	1108.87	1031.24
33	1522.9	1539.34	1623.61	1684.81	1694.6	1599.83	1408.55	1250.84	1106.77	1027.04
34	1538.99	1565.21	1665.22	1743.56	1785.17	1696.35	1466.95	1277.77	1104.67	1023.54
35	1561.02	1590.74	1702.64	1815.94	1948.47	1816.64	1528.14	1307.84	1103.97	1020.4
36	1581.65	1621.51	1746.00	1893.92	2137.3	1980.99	1608.57	1344.91	1105.37	1018.3
37	1605.78	1648.44	1782.02	2042.89	2403.42	2208.64	1691.8	1398.06	1111.66	1015.5
38	1625.01	1677.46	1822.93	2226.83	2640.86	2445.73	1820.84	1453.66	1121.81	1011.3
39	1645.99	1699.49	1853.36	2453.07	2947.54	2661.14	1962.11	1522.55	1137.89	1007.81
40	1667.67	1722.92	1886.23	2730.38	3230.79	2901.73	2148.84	1583.05	1155.03	1005.71
41	1738.31	1773.63	1926.79	2982.16	3559.14	3197.92	2312.5	1652.29	1174.96	1003.61
42	1920.85	1887.98	1997.08	3310.17	3882.96	3457.04	2517.42	1715.93	1203.28	1002.21
43	2138.7	2042.19	2156.54	3654.96	4136.13	3739.93	2718.84	1802.65	1231.96	999.76
44	2358.31	2244.31	2370.2	3956.74	4368.33	3993.46	2938.45	1897.07	1269.72	996.62
45	2593.65	2409.71	2631.77	4269.02	4612.06	4187.54	3192.67	2034.15	1310.99	993.47
46	2791.57	2596.1	2959.08	4511.35	4775.02	4381.62	3437.1	2194.66	1344.56	991.37
47	3023.07	2755.91	3264.36	4766.27	4877.48	4485.82	3617.89	2345.02	1382.67	991.02
48	3215.4	2948.24	3635.03	4917.34	4879.92	4514.5	3786.79	2496.44	1412.05	991.72
49	3407.03	3099.65	3931.57	4999.52	4842.16	4463.79	3880.16	2666.74	1441.42	992.42



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4.12 Candela Tabulation-Cont.

50	3486.76	3205.61	4238.04	4994.97	4769.42	4348.05	3924.57	2793.67	1462.75	991.37
51	3427.31	3184.98	4454.35	4965.25	4603.67	4217.26	3896.25	2898.23	1484.43	984.73
52	3363.67	3123.08	4634.79	4915.59	4384.41	4068.64	3798.68	2938.8	1498.42	971.09
53	3326.95	3150.71	4722.91	4776.42	4066.55	3853.93	3662.65	2928.3	1512.06	951.51
54	3314.01	3214.7	4769.42	4563.81	3736.79	3628.73	3473.82	2871.3	1521.15	919.68
55	3317.16	3351.08	4750.89	4193.13	3379.4	3310.86	3329.05	2774.09	1533.39	881.57
56	3321.71	3508.44	4688.64	3806.73	2921.31	3017.13	3188.12	2676.88	1551.22	838.21
57	3310.52	3645.17	4618.71	3351.43	2595.4	2680.02	3077.62	2561.83	1564.16	811.98
58	3284.64	3789.24	4516.6	2993.7	2269.14	2344.67	2945.44	2444.33	1564.16	796.24
59	3246.87	3888.55	4360.64	2581.76	1898.12	2065.97	2737.37	2339.78	1543.18	766.87
60	3206.31	3969.33	4097.32	2249.21	1611.37	1745.3	2477.2	2214.94	1484.78	717.56
61	3142.32	4016.54	3809.17	1908.61	1341.41	1483.73	2241.16	2102.34	1397.36	694.45
62	3067.48	4046.96	3436.4	1656.13	1102.57	1230.21	1963.16	1969.11	1310.29	671.20
63	3003.49	4071.79	3112.24	1386.87	921.43	1057.11	1735.16	1861.75	1198.39	657.73
64	2928.3	4098.37	2797.52	1184.05	774.91	897.65	1516.26	1762.79	1094.53	655.67
65	2822.35	4128.79	2475.46	1020.75	654.97	746.94	1287.21	1650.89	967.94	668.19
66	2756.61	4153.97	2195.35	874.92	581.88	654.62	1096.98	1551.92	864.08	681.41
67	2768.15	4239.29	1947.07	773.86	518.24	595.17	961.30	1422.89	680.95	682.07
68	2888.44	4412.74	1766.28	672.45	475.23	557.76	824.22	1299.1	622.03	626.05
69	3014.68	4635.14	1594.59	587.48	451.80	496.91	692.04	1141.04	511.91	551.85
70	3112.59	4935.52	1471.85	526.28	416.83	434.31	586.78	980.88	405.40	457.92
71	3125.88	5107.22	1362.04	465.79	381.86	388.51	495.16	697.04	337.03	369.73
72	3068.53	5161.77	1241.4	421.38	349.34	353.19	410.54	697.04	285.84	316.26
73	2943.69	5050.57	1130.2	381.51	313.67	321.01	353.89	575.73	247.20	275.63
74	2796.12	4805.44	986.48	343.05	288.14	307.38	300.38	456.83	220.34	243.63
75	2671.28	4554.01	859.19	313.67	264.02	303.88	267.51	335.04	196.21	212.30
76	2540.85	4248.73	728.75	291.29	246.18	266.46	234.64	269.09	181.31	179.43
77	2419.86	3989.61	635.04	270.31	229.40	242.69	209.81	223.84	168.94	160.40
78	2271.24	3737.14	544.82	248.98	211.21	223.80	186.38	196.39	159.56	145.86
79	2119.47	3436.05	469.98	234.99	195.83	203.52	180.09	172.75	149.42	135.54
80	1947.42	3125.88	425.57	219.60	184.29	185.34	153.97	154.91	136.00	126.41
81	1690.4	2809.06	372.77	204.57	180.79	179.74	139.35	136.69	126.97	116.38
82	1376.38	2332.43	325.91	192.33	163.09	152.08	126.76	121.03	116.76	106.34
83	1093.83	1884.13	291.99	180.44	152.57	137.39	112.74	106.48	108.44	97.63
84	880.52	1484.43	256.32	180.44	139.70	125.99	101.20	91.86	99.10	89.63
85	663.36	1121.81	230.10	155.02	129.42	115.75	89.52	81.23	90.43	79.87
86	509.15	895.91	206.67	140.26	129.84	103.65	78.89	70.25	83.44	69.73
87	384.66	677.35	179.39	128.34	130.92	91.76	69.13	60.60	76.09	60.64
88	282.20	513.70	179.39	113.09	119.14	83.82	56.51	52.98	66.44	50.77
89	223.10	383.26	132.50	100.05	102.35	74.59	47.10	44.34	56.41	41.79
90	189.53	276.95	109.87	84.63	86.06	67.39	34.23	37.03	44.10	31.86
91	118.65	210.86	91.48	72.25	73.72	62.14	24.58	30.39	35.18	23.11
92	80.11	183.59	73.86	60.85	58.33	56.97	20.21	24.06	24.93	16.89
93	62.70	106.31	55.29	47.80	49.24	44.62	17.27	18.18	19.23	12.69
94	43.71	73.82	42.66	38.08	39.30	32.70	14.51	13.11	14.72	9.93
95	31.12	52.35	31.82	28.54	31.61	28.29	10.28	10.49	11.40	7.13
96	20.67	33.01	24.37	21.61	24.30	23.22	8.15	7.80	8.50	5.35
97	12.73	19.51	16.86	15.88	19.48	16.64	6.05	6.29	6.12	3.85
98	7.69	14.09	11.54	10.88	15.70	10.95	4.34	4.86	4.93	3.32
99	4.41	8.53	8.67	8.43	12.17	7.31	3.15	3.74	3.78	3.01
100	1.61	4.62	6.99	6.64	7.27	4.86	2.24	2.94	3.15	2.66
101	1.01	3.25	5.91	5.63	4.97	3.46	1.64	2.59	2.90	2.69
102	0.91	2.41	5.17	4.76	4.20	2.87	1.33	2.31	2.66	2.66



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4.12 Candela Tabulation-Cont.

103	1.01	2.13	4.37	4.23	3.67	2.41	1.12	2.38	2.31	2.59
104	0.94	1.71	3.88	3.88	3.15	2.24	1.22	2.34	2.27	2.66
105	0.77	1.50	3.43	3.36	2.83	2.10	1.29	2.45	2.20	2.69
106	0.98	1.43	3.15	3.18	2.73	2.03	1.26	2.38	2.27	2.90
107	0.94	1.29	2.69	2.90	2.55	2.10	1.22	2.52	2.38	3.01
108	0.84	1.12	2.48	2.69	2.41	1.92	1.26	2.66	2.48	3.11
109	0.91	1.26	2.27	2.62	2.27	1.92	1.40	2.59	2.62	3.32
110	0.91	1.05	1.99	2.38	2.31	1.82	1.33	2.73	2.66	3.39
111	0.94	1.08	1.78	2.20	2.10	1.82	1.33	2.83	2.83	3.53
112	0.87	0.94	1.78	1.99	2.03	1.82	1.26	2.94	2.87	3.67
113	0.87	1.08	1.36	1.89	1.96	1.78	1.33	3.04	2.90	3.85
114	0.94	1.05	1.47	1.85	1.82	1.75	1.43	3.15	3.11	3.88
115	0.80	0.98	1.33	1.61	1.85	1.85	1.26	3.25	3.22	3.95
116	0.87	0.98	1.29	1.68	1.78	1.68	1.40	3.39	3.39	4.20
117	0.80	1.05	1.26	1.54	1.68	1.78	1.40	3.53	3.50	4.34
118	0.77	0.98	1.29	1.57	1.75	1.75	1.50	3.74	3.71	4.48
119	0.91	1.12	1.15	1.57	1.71	1.85	1.71	3.71	3.81	4.62
120	0.94	1.08	1.15	1.54	1.92	2.10	1.99	3.88	3.88	4.62
121	0.91	0.94	1.36	1.54	1.96	2.27	2.31	3.78	3.85	4.76
122	1.05	1.08	1.26	1.57	2.27	2.55	2.69	3.78	3.95	4.55
123	1.12	1.15	1.33	1.64	2.13	2.80	2.94	3.78	3.92	4.51
124	1.22	1.26	1.57	1.68	2.34	3.04	3.29	3.67	3.85	4.48
125	1.29	1.50	1.47	1.89	2.66	3.32	3.74	3.74	3.81	4.37
126	1.40	1.36	1.61	2.06	2.66	3.60	4.13	3.64	3.78	4.23
127	1.50	1.64	1.71	2.06	2.90	3.85	4.48	3.60	3.67	4.20
128	1.57	1.68	1.78	2.20	2.97	4.13	4.76	3.53	3.50	4.02
129	1.61	1.75	1.92	2.31	3.15	4.06	4.93	3.36	3.60	3.92
130	1.82	1.82	2.03	2.38	3.29	4.27	5.04	3.32	3.29	3.71
131	1.64	1.78	2.13	2.45	3.22	4.27	5.04	2.97	3.29	3.60
132	1.71	1.82	1.99	2.34	3.32	4.37	5.11	3.01	3.04	3.32
133	1.71	1.82	1.99	2.41	3.25	4.30	5.07	2.87	3.04	3.22
134	1.64	1.75	1.99	2.38	3.15	4.16	5.04	2.73	3.01	3.08
135	1.71	1.68	1.96	2.41	3.22	3.99	4.83	2.69	2.87	2.97
136	1.57	1.61	1.85	2.20	2.97	3.95	4.65	2.73	2.87	3.08
137	1.61	1.64	1.75	2.06	2.97	3.85	4.27	2.73	3.04	3.15
138	1.54	1.64	1.78	2.13	2.87	3.53	4.30	2.97	3.15	3.22
139	1.57	1.64	1.75	2.10	2.83	3.50	4.09	2.87	3.18	3.29
140	1.68	1.71	1.85	2.24	2.76	3.39	3.99	2.97	3.22	3.25
141	1.75	1.68	1.92	2.27	2.69	3.36	3.88	3.04	3.29	3.36
142	1.68	1.85	1.89	2.24	2.73	3.32	3.85	3.22	3.25	3.36
143	1.85	1.89	2.03	2.24	2.69	3.15	3.81	3.18	3.43	3.36
144	1.85	1.92	2.20	2.24	2.66	3.36	3.81	3.25	3.67	3.57
145	2.17	2.17	2.13	2.38	2.73	3.25	3.78	3.53	3.74	3.60
146	2.20	2.20	2.34	2.45	2.76	3.32	3.85	3.64	3.78	3.74
147	2.31	2.38	2.38	2.59	2.90	3.39	3.85	3.78	3.92	3.74
148	2.41	2.48	2.55	2.73	3.01	3.50	4.06	3.74	4.02	3.85
149	2.52	2.62	2.62	2.73	3.11	3.57	4.13	3.74	4.02	3.99
150	2.76	2.80	2.83	3.01	3.29	3.64	4.30	3.57	3.74	3.71
151	2.90	2.80	3.04	3.08	3.39	3.85	4.44	3.46	3.60	3.60
152	2.94	2.90	2.97	3.22	3.50	3.88	4.44	3.57	3.60	3.57
153	3.11	3.11	3.18	3.32	3.43	3.92	4.23	3.57	3.50	3.57
154	3.15	3.18	3.22	3.36	3.67	4.02	4.27	3.39	3.53	3.46
155	3.39	3.46	3.36	3.53	3.74	4.09	4.41	3.39	3.57	3.43





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**4.12 Candela Tabulation-Cont.**

156	3.50	3.50	3.57	3.57	3.99	4.16	4.48	3.46	3.57	3.50
157	3.57	3.81	3.85	4.09	3.99	4.30	4.65	3.57	3.50	3.50
158	3.81	3.81	3.99	4.09	4.23	4.34	4.55	3.50	3.67	3.60
159	4.06	3.99	4.02	4.27	4.51	4.48	4.72	3.64	3.64	3.64
160	4.20	4.20	4.23	4.34	4.48	4.65	4.86	3.85	3.67	3.71
161	4.37	4.37	4.34	4.48	4.65	4.79	4.90	3.81	3.88	3.85
162	4.41	4.37	4.44	4.65	4.76	4.72	5.04	3.88	3.99	3.99
163	4.58	4.51	4.62	4.62	4.83	4.97	5.00	3.92	4.09	4.13
164	4.58	4.65	4.69	4.86	4.90	4.90	5.04	4.13	4.20	4.27
165	4.65	4.76	4.86	4.86	4.93	4.97	5.11	4.37	4.30	4.37
166	4.86	4.76	4.76	4.83	4.97	5.14	5.17	4.48	4.55	4.55
167	4.79	4.86	4.97	5.04	4.97	5.07	5.17	4.58	4.58	4.62
168	5.00	4.90	5.11	5.11	5.17	5.17	5.25	4.62	4.72	4.72
169	4.97	4.97	5.00	5.14	5.14	5.17	5.32	4.69	4.72	4.83
170	5.17	5.04	5.17	5.17	5.14	5.21	5.32	4.79	4.83	4.90
171	5.28	5.17	5.14	5.11	5.28	5.28	5.25	4.86	4.90	4.86
172	5.17	5.14	5.21	5.28	5.21	5.35	5.38	5.04	4.86	4.90
173	5.35	5.17	5.25	5.21	5.25	5.25	5.28	4.93	5.04	5.04
174	5.11	5.25	5.17	5.35	5.21	5.21	5.28	5.14	5.17	5.00
175	5.28	5.21	5.28	5.21	5.28	5.17	5.38	5.21	5.14	5.11
176	5.32	5.21	5.32	5.14	5.25	5.21	5.42	5.11	5.17	5.21
177	5.25	5.17	5.28	5.21	5.17	5.35	5.42	5.28	5.21	5.21
178	5.32	5.21	5.32	5.21	5.42	5.28	5.35	5.28	5.25	5.35
179	5.21	5.35	5.28	5.32	5.35	5.32	5.28	5.46	5.28	5.32
180	5.31	5.31	5.31	5.31	5.31	5.31	5.31	5.31	5.31	5.31

**Vert. Angles Horizontal Angles**

	150	165	180	195	210	225	240	255	270	285
0	1174.64	1174.64	1174.64	1174.64	1174.64	1174.64	1174.64	1174.64	1174.64	1174.64
1	1159.92	1159.92	1160.27	1164.47	1168.31	1171.81	1178.11	1184.05	1192.44	1182.3
2	1152.58	1151.53	1150.83	1158.52	1163.07	1167.62	1175.66	1184.4	1195.24	1186.5
3	1144.19	1143.49	1143.14	1150.48	1156.78	1163.42	1174.61	1186.5	1199.09	1190.35
4	1137.89	1135.09	1135.09	1144.19	1152.23	1159.92	1174.26	1188.6	1201.88	1197.34
5	1131.6	1127.75	1127.75	1136.84	1148.03	1157.12	1174.26	1191.04	1206.08	1201.18
6	1123.2	1117.61	1119.36	1129.85	1143.84	1155.03	1174.61	1193.14	1210.28	1208.18
7	1117.61	1109.92	1112.01	1123.9	1138.94	1152.93	1174.61	1195.94	1214.82	1214.82
8	1109.92	1102.57	1104.32	1117.61	1133.35	1150.48	1174.96	1199.09	1220.77	1221.82
9	1103.27	1094.53	1095.93	1110.27	1128.45	1148.73	1176.01	1201.88	1225.66	1229.86
10	1095.58	1087.54	1089.28	1102.92	1122.51	1146.63	1177.06	1206.08	1232.66	1236.85
11	1089.28	1079.49	1082.99	1096.98	1118.31	1144.88	1179.15	1209.93	1238.6	1245.6
12	1082.99	1073.2	1075.65	1090.33	1113.76	1143.14	1181.6	1213.08	1243.5	1252.94
13	1075.65	1065.51	1069.35	1084.74	1108.87	1141.74	1183.35	1215.87	1250.84	1261.33
14	1069.7	1058.86	1062.36	1079.49	1104.32	1140.69	1183.7	1220.07	1257.14	1268.33
15	1063.76	1051.87	1056.41	1072.5	1099.78	1138.94	1184.4	1224.96	1265.18	1277.77
16	1058.51	1045.57	1049.77	1067.95	1096.28	1137.19	1184.75	1227.76	1270.77	1286.16
17	1052.57	1038.58	1043.47	1061.31	1091.38	1134.74	1185.1	1231.61	1277.77	1294.2
18	1046.62	1031.24	1036.83	1055.71	1087.19	1132.65	1185.45	1235.45	1285.11	1303.99
19	1041.38	1025.99	1031.59	1051.17	1082.64	1131.6	1186.5	1238.6	1292.11	1315.18
20	1035.43	1020.05	1025.99	1046.62	1078.09	1129.5	1187.2	1242.1	1300.5	1327.07
21	1030.89	1014.8	1021.45	1041.73	1074.6	1127.75	1187.55	1245.6	1310.29	1343.16
22	1025.29	1010.95	1017.25	1037.88	1071.1	1124.25	1187.2	1249.44	1324.63	1359.94
23	1021.79	1005.71	1013.4	1034.03	1068.3	1120.06	1186.85	1253.29	1340.71	1384.07



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4.12 Candela Tabulation-Cont.

24	1018.65	1001.51	1007.81	1029.14	1065.51	1116.56	1184.4	1260.28	1360.99	1410.3
25	1014.45	995.22	1003.26	1025.64	1062.36	1112.36	1182.3	1268.33	1391.77	1446.32
26	1009.9	989.27	998.01	1019.7	1058.86	1108.87	1179.85	1280.91	1430.23	1486.53
27	1005.71	983.33	993.47	1015.15	1055.37	1105.02	1178.45	1295.25	1470.8	1534.79
28	1001.51	979.13	988.92	1010.25	1052.22	1101.52	1177.06	1313.09	1520.8	1603.33
29	997.67	975.99	984.73	1005.71	1048.02	1096.28	1176.36	1340.01	1590.39	1674.32
30	993.47	972.14	979.83	1003.26	1043.83	1091.03	1177.76	1368.34	1662.78	1791.46
31	989.62	968.99	976.68	1000.81	1039.63	1085.79	1180.9	1416.94	1773.98	1970.15
32	985.43	966.19	972.84	998.37	1036.13	1081.24	1188.25	1454.36	1925.39	2177.52
33	982.63	963.40	968.64	994.52	1033.68	1077.39	1200.49	1515.56	2088.35	2442.93
34	980.18	960.60	964.45	990.67	1030.19	1072.5	1213.42	1586.19	2305.51	2682.82
35	977.73	957.80	960.25	986.48	1025.99	1068.3	1233.71	1654.38	2500.98	2954.18
36	974.59	955.00	956.05	981.58	1022.14	1065.16	1256.79	1739.71	2699.61	3199.66
37	971.79	950.81	952.21	976.68	1017.25	1062.01	1282.66	1820.84	2942.29	3529.42
38	968.99	946.96	947.66	970.74	1012.35	1060.26	1318.33	1930.29	3168.54	3798.33
39	965.84	943.46	942.07	965.49	1006.41	1058.16	1359.24	2048.48	3438.5	4089.97
40	964.10	939.27	935.77	957.80	1000.11	1057.81	1397.71	2215.29	3692.03	4305.73
41	959.55	932.27	926.33	949.06	992.07	1057.81	1437.92	2375.79	3886.45	4483.03
42	954.30	923.53	910.94	936.82	984.73	1058.51	1485.13	2549.94	4048.71	4642.84
43	948.36	910.59	891.71	918.29	973.89	1059.91	1524.3	2740.87	4178.45	4737.25
44	941.37	888.91	858.49	893.46	961.30	1064.11	1564.16	2890.89	4240.34	4788.65
45	931.23	854.64	803.24	844.15	942.76	1067.95	1599.83	3060.49	4238.94	4765.23
46	913.04	803.94	692.42	782.26	918.64	1073.2	1632.00	3211.9	4183.69	4690.74
47	891.71	685.88	675.85	687.00	893.46	1079.49	1666.27	3307.72	4094.87	4560.66
48	863.73	673.22	632.76	636.89	837.16	1081.59	1711.03	3356.68	3974.58	4427.77
49	809.53	599.05	588.81	574.92	696.37	1077.39	1750.55	3344.44	3801.48	4219.01
50	691.06	558.74	528.45	528.17	677.91	1066.56	1798.81	3263.66	3633.98	3990.31
51	665.99	514.29	467.47	488.66	621.33	1043.13	1840.77	3147.56	3447.94	3688.53
52	615.11	476.35	424.59	448.13	579.86	1015.5	1882.03	2981.46	3308.07	3394.44
53	577.16	437.11	404.35	425.71	535.24	969.69	1908.61	2844.73	3148.61	3030.06
54	532.44	417.18	392.70	408.96	493.94	920.38	1909.66	2706.6	2968.52	2701.7
55	489.95	401.37	380.53	394.98	440.54	880.17	1883.08	2606.59	2707.65	2370.2
56	444.32	386.97	366.44	380.92	417.00	854.64	1819.09	2496.09	2435.94	1992.53
57	412.63	371.55	354.34	362.14	400.61	827.02	1740.76	2352.01	2107.93	1656.48
58	397.67	348.29	340.18	344.06	387.63	773.51	1626.41	2200.6	1780.97	1407.85
59	382.67	331.12	328.67	328.53	372.11	745.54	1493.18	2071.56	1526.75	1156.78
60	366.89	319.13	314.27	316.68	358.22	705.67	1365.19	1931.34	1266.23	968.64
61	352.10	304.96	300.14	302.83	342.42	681.20	1212.72	1817.69	1078.79	780.51
62	335.77	293.46	288.29	289.40	327.17	677.00	1081.24	1678.51	900.80	656.72
63	322.73	280.31	275.38	277.93	313.88	688.54	958.50	1550.53	687.56	555.31
64	307.97	268.67	259.47	263.67	301.99	695.29	764.07	1396.31	687.56	499.71
65	296.85	254.22	242.02	249.82	287.51	686.37	680.01	1253.64	590.07	466.84
66	285.17	240.55	227.37	234.05	275.03	635.46	583.84	1074.6	500.65	457.74
67	271.19	225.44	213.21	220.83	259.82	560.90	472.36	921.43	409.77	431.52
68	258.39	213.70	196.42	205.93	246.81	489.64	367.35	688.64	353.82	378.01
69	243.38	198.90	181.80	192.37	232.02	412.67	311.36	625.91	306.54	340.95
70	230.90	183.10	161.63	177.43	218.77	341.79	271.99	510.09	275.52	311.57
71	216.14	168.10	144.53	159.21	204.39	299.23	245.06	384.41	246.88	289.89
72	201.56	150.26	124.49	143.72	191.14	260.34	216.84	287.31	224.75	293.04
73	189.01	134.74	101.90	125.01	175.41	227.23	194.67	238.59	207.12	268.56
74	172.96	119.66	85.81	110.71	161.56	194.74	180.16	208.03	189.11	244.08
75	159.98	104.38	64.87	93.86	146.49	170.33	169.95	188.27	170.86	222.40
76	145.68	88.44	45.77	78.12	132.92	156.59	159.25	167.99	154.63	206.32

**4.12 Candela Tabulation-Cont.**

77	134.81	75.74	29.27	66.72	121.59	142.88	147.67	152.53	142.04	191.28
78	122.25	65.50	17.38	55.25	110.96	132.32	137.15	137.50	131.38	180.44
79	111.97	54.55	10.80	47.38	99.52	121.10	127.92	124.59	117.22	159.70
80	102.11	47.17	6.05	40.49	89.70	111.45	117.67	112.36	105.47	145.19
81	91.06	39.87	4.37	33.53	79.97	101.86	108.96	99.45	93.93	133.41
82	82.77	34.06	4.06	29.16	72.07	91.97	99.87	89.10	84.00	120.50
83	73.26	29.48	4.09	24.30	63.92	84.48	92.11	78.96	73.78	108.19
84	62.63	24.62	4.48	21.51	54.45	76.02	85.29	70.36	63.26	100.43
85	54.06	21.16	4.62	18.46	47.31	68.19	77.49	61.86	54.52	90.01
86	44.76	18.29	4.97	16.19	39.76	58.43	68.89	53.78	43.61	80.78
87	37.45	15.32	5.21	13.99	33.53	50.08	58.43	47.07	32.80	73.08
88	31.23	13.29	5.67	11.68	26.72	40.46	48.19	39.20	25.04	64.24
89	24.34	10.84	6.01	10.11	20.74	32.14	40.21	32.94	21.96	59.34
90	18.11	9.37	6.12	8.57	16.16	23.22	31.68	26.82	19.72	54.03
91	14.02	8.04	6.71	7.52	12.13	17.17	23.85	22.34	16.96	42.84
92	10.42	6.71	6.89	6.75	9.90	13.22	17.07	16.40	14.27	34.62
93	7.90	6.33	7.27	6.85	8.08	10.67	13.60	11.64	10.88	30.07
94	6.33	6.36	7.59	7.03	6.92	7.66	10.35	9.41	7.55	24.34
95	5.07	6.57	7.73	7.17	6.47	6.19	8.04	7.24	6.16	17.76
96	4.83	6.64	8.08	7.27	6.22	5.21	6.22	5.77	4.44	13.11
97	4.58	6.75	8.18	7.34	6.12	4.58	4.97	4.51	3.64	9.34
98	4.65	6.85	8.39	7.45	6.29	4.30	4.13	3.67	3.15	6.22
99	4.79	7.06	8.74	7.55	6.33	3.95	3.64	3.15	2.69	4.69
100	4.79	7.17	8.88	7.52	6.43	3.99	3.25	3.04	2.69	3.57
101	5.14	7.24	9.09	7.76	6.54	3.85	3.08	2.87	2.83	3.08
102	5.28	7.41	9.13	7.80	6.75	3.95	2.97	2.87	2.94	2.76
103	5.53	7.48	9.30	7.87	7.03	4.20	2.90	2.80	3.11	2.45
104	5.59	7.52	9.48	8.01	6.99	4.13	3.04	2.76	3.29	2.34
105	5.67	7.59	9.41	8.11	7.24	4.27	3.04	2.90	3.32	2.17
106	6.01	7.73	9.48	8.15	7.13	4.48	3.01	3.08	3.36	2.17
107	6.01	7.94	9.62	8.18	7.38	4.62	3.22	3.18	3.53	2.10
108	6.16	7.97	9.69	8.29	7.48	4.76	3.32	3.36	3.60	2.03
109	6.29	8.04	9.69	8.43	7.55	4.86	3.57	3.39	3.85	2.17
110	6.33	8.04	9.69	8.39	7.59	5.04	3.67	3.57	4.06	2.03
111	6.50	8.04	9.72	8.53	7.69	5.14	3.67	3.53	4.06	2.10
112	6.47	8.11	9.55	8.39	7.59	5.25	3.88	3.74	4.13	1.96
113	6.43	8.04	9.58	8.43	7.62	5.21	4.06	3.92	4.16	1.82
114	6.43	8.15	9.58	8.43	7.55	5.25	4.06	3.99	4.23	1.89
115	6.50	8.01	9.13	8.32	7.59	5.38	4.27	4.06	4.44	1.85
116	6.64	8.08	9.16	8.22	7.52	5.46	4.37	4.13	4.37	1.78
117	6.61	8.08	9.02	8.15	7.48	5.74	4.65	4.27	4.65	1.75
118	6.61	7.87	8.85	8.04	7.24	5.63	4.62	4.51	4.62	1.71
119	6.57	8.04	8.67	7.83	7.31	5.77	4.86	4.44	4.62	1.75
120	6.54	7.69	8.25	7.59	6.89	5.63	4.72	4.65	4.69	1.89
121	6.47	7.41	8.01	7.31	6.82	5.63	4.72	4.55	4.76	2.10
122	6.19	7.34	7.55	6.85	6.43	5.49	4.69	4.55	4.55	2.13
123	6.19	6.96	7.06	6.57	6.29	5.21	4.55	4.37	4.41	2.34
124	5.70	6.61	6.57	6.19	5.88	5.17	4.37	4.23	4.34	2.62
125	5.59	6.19	6.05	5.84	5.46	4.83	4.34	4.20	4.20	2.76
126	5.35	5.84	5.59	5.49	5.21	4.65	4.20	3.95	3.99	3.08
127	5.04	5.49	5.17	4.97	5.00	4.44	4.02	3.85	3.88	3.15
128	4.79	4.97	4.72	4.65	4.62	4.34	4.02	3.92	3.78	3.32
129	4.62	4.76	4.34	4.34	4.41	4.16	3.74	3.74	3.67	3.43



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4.12 Candela Tabulation-Cont.

130	4.37	4.48	3.92	3.88	3.99	3.78	3.43	3.43	3.43	3.39
131	4.06	4.02	3.57	3.53	3.60	3.50	3.39	3.22	3.25	3.46
132	3.64	3.67	3.18	3.29	3.43	3.25	3.11	3.15	2.97	3.50
133	3.50	3.25	2.83	2.94	3.11	3.11	2.97	3.08	2.80	3.36
134	3.18	3.08	2.55	2.66	2.90	2.97	3.01	2.83	2.73	3.36
135	3.04	2.76	2.41	2.41	2.55	2.80	2.62	2.73	2.48	3.25
136	2.97	2.52	2.41	2.45	2.69	2.66	2.73	2.66	2.45	3.22
137	3.15	2.83	2.38	2.45	2.66	2.76	2.76	2.73	2.52	2.97
138	3.11	2.69	2.38	2.52	2.66	2.76	2.73	2.69	2.62	2.90
139	3.04	2.66	2.45	2.45	2.66	2.69	2.76	2.76	2.45	2.73
140	3.08	2.76	2.38	2.34	2.52	2.66	2.73	2.90	2.48	2.83
141	3.08	2.66	2.34	2.38	2.59	2.66	2.73	2.66	2.59	2.87
142	3.11	2.62	2.27	2.34	2.62	2.73	2.80	2.73	2.62	2.73
143	3.25	2.62	2.45	2.48	2.59	2.69	2.87	2.76	2.62	2.73
144	3.11	2.83	2.52	2.52	2.66	2.87	2.94	2.80	2.66	2.76
145	3.29	2.83	2.52	2.52	2.55	2.90	2.94	2.87	2.66	2.76
146	3.36	2.87	2.69	2.62	2.76	2.80	3.04	2.90	2.76	2.76
147	3.39	2.90	2.66	2.66	2.83	3.04	3.15	3.08	2.83	2.69
148	3.50	3.01	2.80	2.73	2.94	3.15	3.18	3.18	2.87	2.90
149	3.43	3.04	2.80	2.80	2.90	3.04	3.04	3.01	2.94	3.04
150	3.39	2.97	2.73	2.90	2.90	3.01	3.04	3.01	2.73	3.18
151	3.18	3.04	2.83	2.90	2.94	3.04	3.04	2.94	2.83	3.46
152	3.39	3.08	2.97	2.94	2.90	2.97	2.94	3.01	2.94	3.39
153	3.32	3.01	2.97	3.04	3.01	3.01	3.04	2.94	2.80	3.39
154	3.36	3.15	3.11	3.04	3.08	3.04	3.08	3.01	2.94	3.64
155	3.32	3.18	3.04	3.11	3.01	3.18	3.15	3.11	3.01	3.60
156	3.39	3.29	3.29	3.22	3.18	3.22	3.25	3.11	3.08	3.88
157	3.50	3.43	3.43	3.22	3.25	3.29	3.18	3.32	3.15	3.92
158	3.60	3.29	3.29	3.43	3.32	3.36	3.39	3.25	3.25	4.09
159	3.64	3.53	3.53	3.57	3.53	3.50	3.39	3.39	3.25	4.20
160	3.64	3.71	3.64	3.60	3.57	3.57	3.60	3.50	3.57	4.34
161	3.88	3.71	3.81	3.78	3.74	3.78	3.57	3.57	3.64	4.48
162	3.95	3.92	3.88	3.85	3.81	3.88	3.74	3.81	3.74	4.51
163	4.06	4.09	3.92	4.09	4.09	3.99	3.99	3.99	4.02	4.65
164	4.23	4.23	4.23	4.23	4.09	4.20	4.13	4.13	3.99	4.76
165	4.34	4.41	4.20	4.20	4.30	4.23	4.30	4.20	4.09	4.76
166	4.48	4.48	4.51	4.41	4.41	4.44	4.44	4.34	4.34	4.90
167	4.58	4.62	4.58	4.55	4.62	4.62	4.48	4.44	4.44	4.93
168	4.65	4.65	4.58	4.65	4.62	4.72	4.58	4.51	4.48	5.04
169	4.72	4.72	4.79	4.72	4.72	4.79	4.69	4.58	4.69	5.11
170	4.86	4.76	4.79	4.76	4.76	4.76	4.79	4.83	4.72	5.14
171	5.00	5.00	4.93	4.97	5.00	4.83	4.83	4.86	4.72	5.17
172	5.04	5.07	5.00	4.93	4.97	4.93	4.86	4.83	4.86	5.11
173	5.07	5.11	5.00	5.07	5.11	5.00	4.97	4.97	4.97	5.38
174	5.11	5.04	5.07	5.00	5.07	5.07	5.04	5.07	5.21	5.28
175	5.07	5.14	5.11	5.07	5.17	5.07	5.07	5.14	5.17	5.35
176	5.17	5.17	5.32	5.25	5.21	5.17	5.14	5.11	5.25	5.42
177	5.28	5.25	5.28	5.14	5.28	5.17	5.25	5.28	5.32	5.35
178	5.32	5.25	5.21	5.38	5.38	5.28	5.21	5.25	5.28	5.42
179	5.28	5.28	5.32	5.28	5.35	5.28	5.21	5.25	5.35	5.32
180	5.31	5.31	5.31	5.31	5.31	5.31	5.31	5.31	5.31	5.31



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4.12 Candela Tabulation-Cont.

Vert. Angles	Horizontal Angles				
	300	315	330	345	360
0	1174.64	1174.64	1174.64	1174.64	1174.64
1	1178.45	1175.66	1176.71	1176.71	1177.41
2	1184.75	1184.05	1186.15	1184.4	1184.75
3	1191.39	1191.04	1194.19	1192.44	1193.49
4	1198.74	1200.14	1204.33	1203.98	1202.23
5	1206.78	1208.53	1213.08	1210.98	1209.58
6	1214.82	1216.92	1223.22	1221.47	1219.37
7	1222.87	1227.06	1232.66	1232.66	1228.46
8	1229.86	1236.5	1244.2	1242.8	1237.9
9	1238.95	1244.9	1253.64	1254.69	1249.44
10	1248.74	1255.04	1265.18	1264.83	1260.98
11	1256.44	1263.78	1274.62	1275.67	1270.42
12	1265.53	1274.62	1285.81	1285.11	1280.21
13	1276.72	1284.06	1295.25	1294.55	1291.4
14	1285.81	1295.6	1306.09	1305.04	1300.5
15	1296.3	1306.44	1314.83	1315.18	1311.34
16	1306.09	1318.68	1326.03	1325.33	1321.48
17	1319.03	1332.67	1336.52	1335.12	1330.92
18	1331.27	1344.56	1348.4	1347.7	1340.36
19	1344.21	1360.64	1362.74	1360.99	1351.9
20	1362.74	1378.83	1378.13	1372.18	1362.04
21	1380.23	1395.96	1393.16	1385.82	1374.28
22	1405.06	1420.09	1414.15	1398.06	1384.07
23	1429.88	1444.57	1434.78	1413.45	1395.96
24	1464.5	1477.09	1459.96	1428.48	1406.45
25	1500.87	1510.66	1485.83	1448.07	1419.04
26	1542.83	1549.83	1519.4	1466.95	1428.83
27	1602.98	1602.98	1552.27	1486.88	1442.47
28	1664.53	1650.54	1594.94	1511.36	1453.31
29	1754.05	1711.03	1635.5	1534.09	1466.95
30	1869.44	1769.08	1686.9	1562.41	1480.59
31	2076.11	1857.55	1741.46	1588.64	1492.48
32	2314.6	1999.53	1780.62	1619.41	1506.12
33	2614.63	2187.31	1836.22	1651.59	1522.9
34	2883.19	2474.76	1892.52	1679.91	1538.99
35	3191.62	2748.91	1941.83	1715.58	1561.02
36	3483.96	3077.62	2016.31	1746.00	1581.65
37	3868.97	3356.68	2111.43	1781.32	1605.78
38	4178.45	3697.27	2277.88	1808.6	1625.01
39	4496.66	4016.19	2470.56	1833.42	1645.99
40	4715.92	4333.71	2734.58	1871.54	1667.67
41	4915.94	4671.16	2979.71	1934.48	1738.31
42	5053.37	4910.00	3287.44	2075.41	1920.85
43	5160.73	5126.11	3577.68	2251.3	2138.7
44	5200.59	5264.23	3899.39	2465.66	2358.31
45	5181.71	5353.4	4244.54	2665.34	2593.65
46	5111.07	5372.29	4540.02	2839.48	2791.57
47	5035.89	5329.28	4773.97	3062.59	3023.07
48	4889.72	5259.34	4918.04	3270.65	3215.4
49	4611.01	5192.2	5018.75	3505.29	3407.03



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4.12 Candela Tabulation-Cont.

50	4295.94	5048.13	5074.35	3675.24	3486.76
51	3885.76	4844.26	5089.74	3780.5	3427.31
52	3506.34	4554.01	5057.22	3856.38	3363.67
53	3046.85	4116.2	4986.23	3978.07	3326.95
54	2668.14	3693.08	4885.87	4087.18	3314.01
55	2313.9	3216.45	4782.71	4197.68	3317.16
56	1938.33	2838.08	4623.25	4313.08	3321.71
57	1611.02	2420.9	4418.68	4394.9	3310.52
58	1360.99	2048.14	4143.48	4451.55	3284.64
59	1106.77	1760.69	3761.97	4504.71	3246.87
60	919.34	1463.1	3366.12	4545.62	3206.31
61	752.53	1238.6	3031.11	4570.8	3142.32
62	633.64	1025.29	2657.99	4572.55	3067.48
63	559.50	884.72	2361.11	4568.00	3003.49
64	503.90	773.86	2100.24	4552.61	2928.3
65	453.90	671.05	1837.27	4543.17	2822.35
66	423.13	598.32	1618.37	4555.76	2756.61
67	411.58	527.68	1462.4	4611.36	2768.15
68	392.70	476.98	1303.99	4746.69	2888.44
69	358.78	428.72	1175.31	4925.38	3014.68
70	325.21	393.75	1033.33	5128.55	3112.59
71	299.33	359.48	917.24	5193.6	3125.88
72	277.65	334.65	795.20	5084.49	3068.53
73	256.67	313.32	703.58	4855.8	2943.69
74	241.64	292.34	610.91	4531.98	2796.12
75	224.85	272.76	541.67	4203.27	2671.28
76	211.56	253.18	473.83	3920.38	2540.85
77	198.62	238.49	423.82	3668.25	2419.86
78	184.64	225.55	374.87	3382.2	2271.24
79	179.74	210.16	339.90	3138.82	2119.47
80	163.87	197.93	309.48	2834.94	1947.42
81	153.37	184.64	279.05	2518.12	1690.4
82	139.07	180.79	254.57	2048.48	1376.38
83	129.00	158.51	228.70	1561.37	1093.83
84	128.44	146.69	205.62	1285.11	880.52
85	122.39	134.84	186.38	993.47	663.36
86	109.80	120.68	180.09	758.48	509.15
87	97.53	105.71	149.00	583.98	384.66
88	84.91	93.12	124.73	429.07	282.20
89	73.08	79.20	107.50	326.26	223.10
90	61.72	68.05	87.95	225.90	189.53
91	52.98	57.03	71.55	180.79	118.65
92	43.75	45.08	56.34	180.79	80.11
93	36.40	35.25	42.03	86.16	62.70
94	28.08	27.00	32.77	62.35	43.71
95	23.36	20.95	24.34	40.32	31.12
96	20.00	15.70	18.32	23.99	20.67
97	15.74	11.89	13.50	16.43	12.73
98	11.99	8.92	9.41	11.33	7.69
99	6.89	7.41	7.34	6.36	4.41
100	5.42	5.95	6.22	3.74	1.61
101	4.48	4.86	5.35	2.87	1.01
102	3.81	4.37	4.65	2.38	0.91



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4.12 Candela Tabulation-Cont.

103	3.39	3.85	3.92	1.92	1.01
104	2.87	3.57	3.53	1.75	0.94
105	2.62	3.15	2.97	1.40	0.77
106	2.59	2.94	2.76	1.22	0.98
107	2.45	2.69	2.38	1.29	0.94
108	2.38	2.41	2.13	1.08	0.84
109	2.27	2.27	1.99	1.08	0.91
110	2.24	2.10	1.82	1.01	0.91
111	2.17	2.03	1.71	1.01	0.94
112	1.92	1.89	1.47	0.91	0.87
113	1.92	1.82	1.40	0.98	0.87
114	1.75	1.61	1.29	0.98	0.94
115	1.78	1.61	1.12	0.77	0.80
116	1.57	1.47	1.19	0.91	0.87
117	1.57	1.36	1.08	0.91	0.80
118	1.54	1.29	1.15	0.98	0.77
119	1.57	1.36	0.98	0.84	0.91
120	1.68	1.43	1.08	0.98	0.94
121	1.82	1.40	1.15	0.98	0.91
122	1.89	1.47	1.15	1.19	1.05
123	1.89	1.54	1.36	1.26	1.12
124	2.03	1.68	1.22	1.15	1.22
125	2.17	1.71	1.50	1.33	1.29
126	2.20	1.78	1.50	1.36	1.40
127	2.34	1.89	1.61	1.54	1.50
128	2.48	1.89	1.85	1.64	1.57
129	2.62	2.06	1.82	1.68	1.61
130	2.73	2.13	1.85	1.85	1.82
131	2.55	2.20	1.96	1.75	1.64
132	2.69	2.10	1.92	1.85	1.71
133	2.62	2.17	1.85	1.68	1.71
134	2.59	2.03	1.82	1.71	1.64
135	2.59	1.99	1.75	1.64	1.71
136	2.34	2.03	1.75	1.57	1.57
137	2.41	1.92	1.75	1.68	1.61
138	2.27	1.85	1.68	1.47	1.54
139	2.24	1.78	1.64	1.61	1.57
140	2.38	1.92	1.78	1.64	1.68
141	2.24	1.96	1.89	1.71	1.75
142	2.31	1.96	1.85	1.92	1.68
143	2.41	2.13	1.92	1.71	1.85
144	2.20	2.17	2.03	1.99	1.85
145	2.34	2.20	2.13	1.99	2.17
146	2.48	2.31	2.10	2.17	2.20
147	2.52	2.38	2.27	2.31	2.31
148	2.59	2.55	2.38	2.38	2.41
149	2.76	2.66	2.59	2.45	2.52
150	2.94	2.80	2.76	2.59	2.76
151	3.01	2.90	2.87	2.87	2.90
152	3.25	2.94	2.97	2.97	2.94
153	3.18	3.25	3.08	3.04	3.11
154	3.29	3.22	3.15	3.18	3.15
155	3.43	3.39	3.53	3.25	3.39



LCTECH



**4.12 Candela Tabulation-Cont.**

156	3.67	3.57	3.46	3.53	3.50
157	3.81	3.78	3.78	3.64	3.57
158	3.88	3.95	3.78	3.71	3.81
159	4.09	4.02	3.99	4.02	4.06
160	4.30	4.20	4.13	4.09	4.20
161	4.27	4.34	4.27	4.27	4.37
162	4.55	4.44	4.51	4.41	4.41
163	4.58	4.51	4.44	4.51	4.58
164	4.62	4.65	4.69	4.62	4.58
165	4.83	4.72	4.69	4.58	4.65
166	4.90	4.72	4.76	4.86	4.86
167	4.86	4.93	4.86	4.83	4.79
168	4.97	5.04	4.97	5.04	5.00
169	5.00	5.04	5.07	5.04	4.97
170	5.14	5.17	5.11	5.11	5.17
171	5.11	5.17	5.17	5.07	5.28
172	5.17	5.25	5.28	5.25	5.17
173	5.38	5.35	5.28	5.17	5.35
174	5.38	5.35	5.35	5.28	5.11
175	5.35	5.42	5.25	5.14	5.28
176	5.35	5.35	5.25	5.35	5.32
177	5.35	5.38	5.28	5.21	5.25
178	5.32	5.25	5.28	5.21	5.32
179	5.42	5.32	5.35	5.46	5.21
180	5.31	5.31	5.31	5.31	5.31

\*\*\*\*End of test report\*\*\*\*