



8165 E Kaiser Blvd. Anaheim, CA 92808
www.lightlaboratory.com

Report No: L041706608



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Issue Date: 4/27/2017

Report Prepared For: Leotek Electronics USA, LLC
1955 Lundy Ave, San Jose, 95131

Model Number: ES2-88H-MV-WW-FT-DB-450

Test: Electrical and Photometric tests

Standards Used: Appropriate part or all test guidelines were used for test performed:
IESNA LM79: 2008 Approved Methods for Electrical and Photometric Measurements of Solid-State Lighting Products
ANSI NEMA ANSLG C78.377: 2008 Specification of the Chromaticity of Solid State Lighting Products
ANSI C82.77:2002: Harmonic Emission Limits-Related Quality Requirements for Lighting Equipment

Description of Sample: Client submitted the sample. Received in working and undamaged condition. No modifications were necessary.

Testing Condition: Fixture is tested with no special conditions.

Sample Arrival Date: 4/18/17

Date of Tests: 4/25/17 - 4/26/17

Seasoning of Sample: No seasoning was performed in accordance with IESNA LM-79.

Equipment List

Equipment Used	Model No	Stock No	Calibration Due Date
Chroma Programmable AC Source	61604	PS-AC02	--
Yokogawa Digital Power Meter	WT210	MT-EL06-S1	11/28/17
ITECH	IT6122	PS-DC03-S1	11/28/17
Fluke Digital Thermometer	52k/J	MT-TP02-GC	11/28/17
LLI Type C Goniophotometer System	RMG-C-MKII	CD-LL04-GC	--
LLI 2M Sphere	2MR97	CD-SN03-S2	--
LLI Spectroradiometer	SPR-3000	MT-SC01-S2	Before Use

*All Results in accordance to IESNA LM-79-2008: Approved Method for the Electrical and Photometric Testing of Solid-State Lighting.

Test Summary

Manufacturer:	Leotek Electronics USA, LLC	
Model Number:	ES2-88H-MV-WW-FT-DB-450	
Driver Model Number:	INVENTRONICS EUD-200S490DT	
Total Lumens:	13491.40	
Input Voltage (VAC/60Hz):	120.00	
Input Current (Amp):	1.08	
Input Power (W):	129.68	
Input Power Factor:	1.00	
Current ATHD @ 120V(%):	5%	
Current ATHD @ 277V(%):	18% (0.52A, 127.58W, 0.89PF)	
Efficacy:	104	
Color Rendering Index (CRI):	73	
Correlated Color Temperature (K):	3070	
Chromaticity Coordinate x:	0.4379	
Chromaticity Coordinate y:	0.4148	
Ambient Temperature (°C):	25.0	
Stabilization Time (Hours):	0:45	
Total Operating Time (Hours):	3:40	

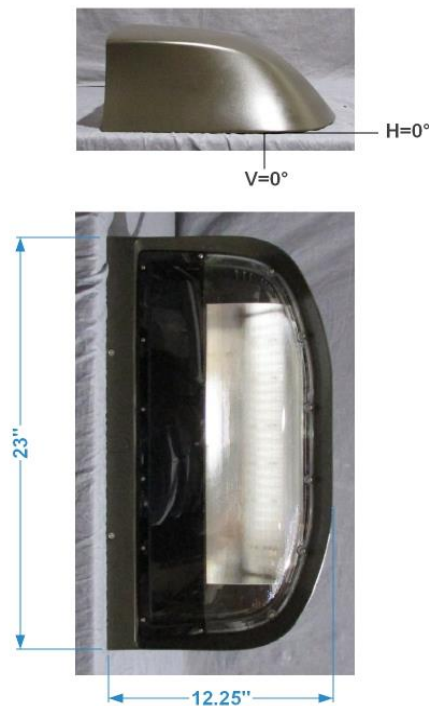
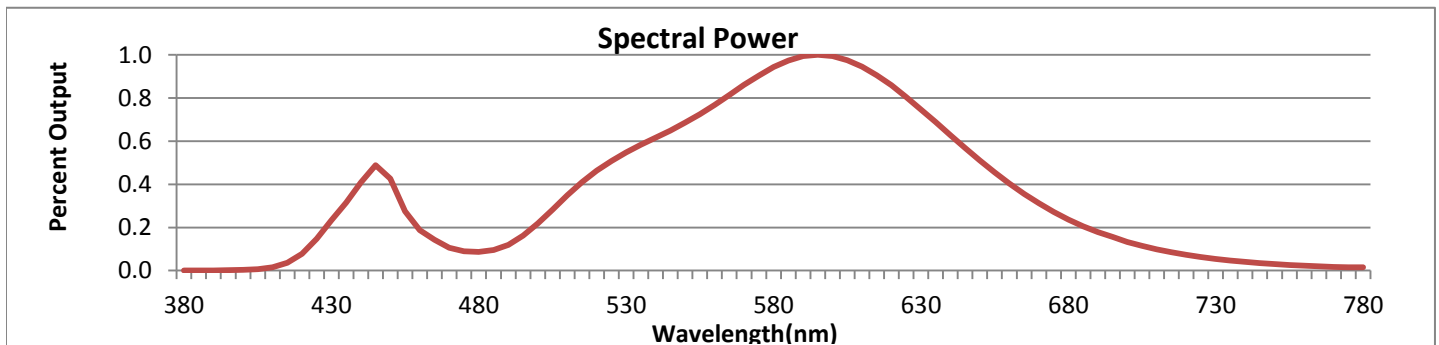


FIG. 1 LUMINAIRE



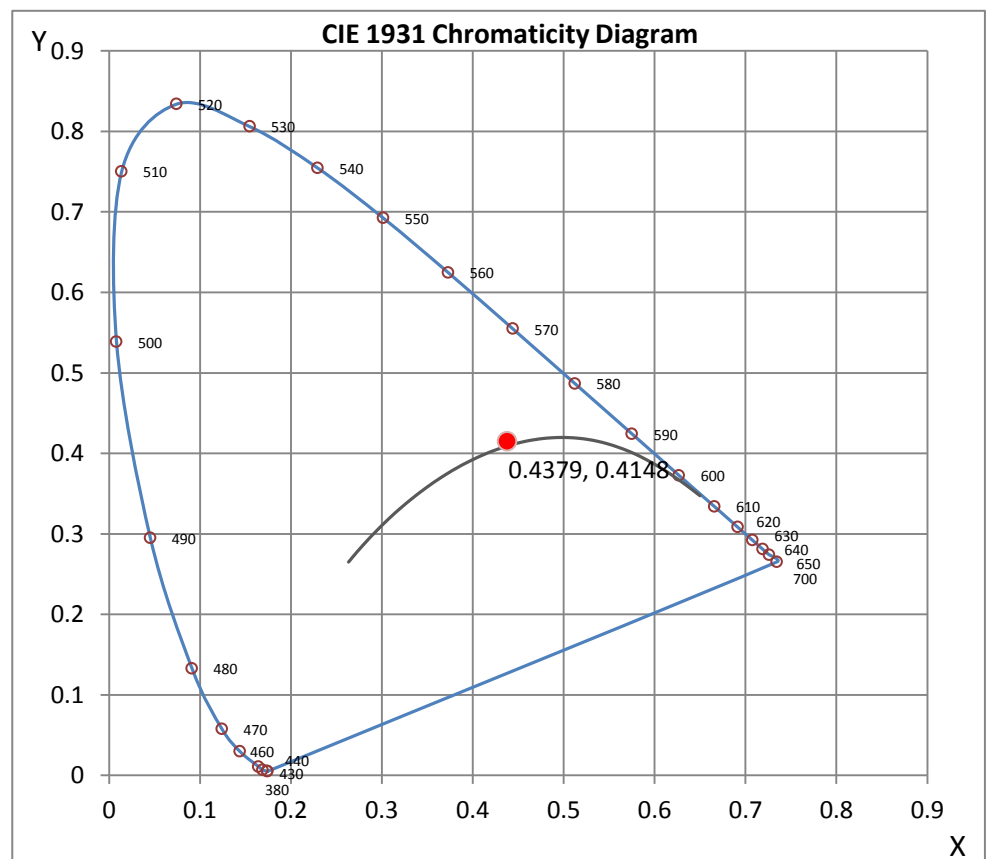
Wavelength	W/m ² nm	440	0.4087	510	0.3491	580	0.9438	650	0.5110	720	0.0734
380	0.0009	450	0.4263	520	0.4639	590	0.9941	660	0.4044	730	0.0541
390	0.0011	460	0.1880	530	0.5477	600	0.9940	670	0.3120	740	0.0402
400	0.0030	470	0.1066	540	0.6162	610	0.9461	680	0.2371	750	0.0302
410	0.0151	480	0.0869	550	0.6857	620	0.8591	690	0.1779	760	0.0229
420	0.0780	490	0.1194	560	0.7679	630	0.7474	700	0.1329	770	0.0172
430	0.2328	500	0.2182	570	0.8611	640	0.6281	710	0.0988	780	0.0150

CRI & CCT

x	0.4379
y	0.4148
u'	0.2466
v'	0.5257
CRI	73.00
CCT	3070
Duv	0.00409

R Values

R1	69.65
R2	80.27
R3	90.71
R4	71.94
R5	68.27
R6	72.53
R7	80.96
R8	49.45
R9	-23.56
R10	54.71
R11	67.76
R12	48.20
R13	71.06
R14	94.35



Test Methods

Photometric Measurements - Goniophotometer

A Custom Light Laboratory Type C Rotating Mirror Goniophotometer was used to measure candelas(intensity) at each angle of distribution as defined by IESNA for the appropriate fixture type.

Ambient temperature is set to 25°C and is measured from the center of the fixture, within 1ft from the outside of the fixture. Temperature is maintained at 25°C throughout the testing process and the sample is stabilized for at least 30mins and longer as necessary for the sample to achieve stabilization.

Electrical measurements are measured using the listed equipment.

Spectral Measurements - Integrating Sphere

A Sensing Spectroradiometer SPR-3000, in conjunction with Light Laboratory 2 meter integrating sphere was used to measure chromaticity coordinates, correlated color temperature(CCT) and the color rendering index(CRI) for each sample.

Ambient temperature is set to 25°C and is measured from the center of the fixture, within 1ft from the outside of the fixture. Temperature is maintained at 25°C throughout the testing process and the sample is stabilized for at least 30mins and longer as necessary for the sample to achieve stabilization.

Electrical measurements are measured using the listed equipment.

Disclaimers:

This report must not be used by the customer to claim product certification, approval or endorsement by NVLAP, NIST or any agency of Federal Government.

Report Prepared by : Jeff Ahn

Test Report Released by:



Jeff Ahn
Engineering Manager

Test Report Reviewed by:



Steve Kang
Quality Assurance

**Attached are photometric data reports. Total number of pages: 24*



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Photometric Test Report

IES ROAD REPORT

PHOTOMETRIC FILENAME : L041706608.IES

DESCRIPTIVE INFORMATION (From Photometric File)

IESNA:LM-63-2002
[TEST] L041706608
[TESTLAB] LIGHT LABORATORY, INC. (www.lightlaboratory.com)
[ISSUEDATE] 4/27/2017
[MANUFAC] Leotek Electronics USA, LLC
[LUMCAT] ES2-88H-MV-WW-FT-DB-450
[LUMINAIRE] outdoor wall lighting product
[BALLASTCAT] INVENTRONICS EUD-200S490DT
[OTHER] INDICATING THE CANDELA VALUES ARE ABSOLUTE AND
[MORE] SHOULD NOT BE FACTORED FOR DIFFERENT LAMP RATINGS.
[INPUT] 120VAC, 129.68W
[TEST PROCEDURE] IESNA:LM-79-08

CHARACTERISTICS

IES Classification	Type III
Longitudinal Classification	Very Short
Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Luminaire Lumens	13491
Downward Total Efficiency	N.A. (absolute)
Total Luminaire Efficiency	N.A. (absolute)
Luminaire Efficacy Rating (LER)	104
Total Luminaire Watts	129.68
Ballast Factor	1.00
Upward Waste Light Ratio	0.00
Maximum Candela	9760
Maximum Candela Angle	5H 56V
Maximum Candela (<90 Degrees Vertical)	9760
Maximum Candela Angle (<90 Degrees Vertical)	5H 56V
Maximum Candela At 90 Degrees Vertical	0 (0.0% Luminaire Lumens)
Maximum Candela from 80 to <90 Degrees Vertical	1717 (12.7% Luminaire Lumens)
Cutoff Classification (deprecated)	N.A. (absolute)

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LUMINAIRE CLASSIFICATION SYSTEM (LCS)

	Lumens	% Lamp	% Luminaire
FL - Front-Low (0-30)	662.8	N.A.	4.9
FM - Front-Medium (30-60)	4058.1	N.A.	30.1
FH - Front-High (60-80)	3431.3	N.A.	25.4
FVH - Front-Very High (80-90)	184.2	N.A.	1.4
BL - Back-Low (0-30)	1336.5	N.A.	9.9
BM - Back-Medium (30-60)	3302.8	N.A.	24.5
BH - Back-High (60-80)	499.7	N.A.	3.7
BVH - Back-Very High (80-90)	16.0	N.A.	0.1
UL - Uplight-Low (90-100)	0.0	N.A.	0.0
UH - Uplight-High (100-180)	0.0	N.A.	0.0
Total	13491.4	N.A.	100.0
BUG Rating	B3-U0-G2		

ZONAL LUMEN SUMMARY

Zone	%
0-20	6.5
0-30	14.8
0-40	27.5
0-60	69.4
0-80	98.5
0-90	100
10-90	98.3
20-40	21
20-50	39.2
40-70	61.9
60-80	29.1
70-80	9.1
80-90	1.5
90-110	0
90-120	0
90-130	0
90-150	0
90-180	0
110-180	0
0-180	100

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CANDELA TABULATION

Vert. Angles	Horizontal Angles									
	<u>0</u>	<u>5</u>	<u>10</u>	<u>15</u>	<u>20</u>	<u>25</u>	<u>30</u>	<u>35</u>	<u>40</u>	<u>45</u>
0.0	2353	2353	2353	2353	2353	2353	2353	2353	2353	2353
0.5	2217	2219	2222	2233	2239	2250	2261	2272	2284	2295
1.0	2147	2153	2157	2167	2176	2192	2203	2218	2226	2236
1.5	2130	2137	2140	2144	2148	2147	2158	2167	2183	2204
2.0	2105	2106	2119	2125	2130	2139	2144	2147	2151	2164
2.5	2091	2097	2107	2111	2117	2118	2122	2130	2142	2144
3.0	2095	2098	2103	2105	2109	2111	2113	2113	2117	2123
3.5	2110	2116	2125	2126	2120	2111	2105	2104	2107	2111
4.0	2081	2086	2096	2104	2115	2121	2118	2106	2100	2102
4.5	2042	2046	2059	2067	2081	2093	2106	2119	2109	2092
5.0	2020	2017	2022	2026	2037	2049	2070	2087	2109	2102
5.5	2010	2002	2010	2016	2017	2024	2032	2052	2075	2097
6.0	1970	1964	1976	1982	1995	2011	2015	2020	2039	2061
6.5	1895	1891	1900	1917	1942	1968	1994	2008	2020	2046
7.0	1897	1888	1895	1896	1894	1910	1948	1983	2004	2020
7.5	1849	1848	1859	1873	1886	1891	1896	1942	1984	2001
8.0	1803	1801	1811	1825	1847	1874	1876	1885	1930	1990
8.5	1764	1765	1773	1787	1796	1820	1858	1870	1883	1946
9.0	1721	1723	1727	1734	1755	1778	1811	1854	1870	1906
9.5	1696	1699	1705	1711	1718	1735	1774	1815	1868	1874
10.0	1677	1681	1685	1684	1689	1702	1722	1768	1826	1865
10.5	1636	1637	1652	1661	1665	1680	1701	1741	1800	1858
11.0	1606	1609	1625	1635	1643	1660	1679	1706	1763	1828
11.5	1598	1602	1608	1607	1611	1625	1649	1679	1714	1777
12.0	1570	1579	1586	1586	1592	1607	1630	1655	1689	1729
12.5	1535	1540	1556	1560	1571	1582	1611	1648	1683	1727
13.0	1503	1508	1523	1528	1537	1559	1593	1625	1662	1700
13.5	1482	1487	1493	1496	1508	1537	1562	1602	1639	1685
14.0	1458	1466	1474	1471	1477	1506	1546	1580	1621	1667
14.5	1439	1441	1449	1448	1456	1475	1514	1561	1605	1657
15.0	1420	1422	1424	1426	1434	1455	1488	1536	1579	1634
15.5	1415	1412	1410	1397	1403	1431	1467	1513	1565	1614
16.0	1420	1409	1402	1388	1378	1405	1444	1486	1549	1598
16.5	1440	1440	1419	1378	1370	1377	1427	1471	1532	1582
17.0	1458	1444	1431	1397	1372	1369	1400	1448	1501	1565
17.5	1496	1457	1461	1422	1381	1355	1375	1413	1469	1532
18.0	1442	1432	1463	1427	1400	1359	1366	1390	1448	1515
18.5	1387	1397	1404	1408	1402	1388	1359	1371	1430	1496
19.0	1356	1366	1356	1364	1380	1387	1364	1359	1396	1465
19.5	1327	1331	1319	1313	1320	1349	1378	1348	1384	1458
20.0	1314	1315	1305	1289	1285	1313	1377	1357	1373	1440
20.5	1306	1310	1295	1278	1266	1278	1346	1371	1362	1410
21.0	1301	1301	1287	1269	1257	1260	1302	1347	1355	1395
21.5	1297	1292	1279	1257	1246	1243	1263	1359	1364	1390
22.0	1282	1279	1267	1246	1237	1232	1244	1302	1380	1388
22.5	1276	1269	1256	1236	1227	1225	1230	1273	1372	1385
23.0	1268	1265	1250	1222	1216	1212	1219	1249	1338	1391
23.5	1265	1257	1240	1217	1204	1203	1212	1231	1303	1410
24.0	1259	1250	1235	1211	1198	1193	1203	1223	1289	1400
24.5	1255	1248	1234	1206	1192	1185	1195	1218	1265	1378
25.0	1249	1244	1231	1206	1189	1183	1186	1210	1250	1340
25.5	1240	1233	1224	1205	1188	1181	1180	1206	1252	1333
26.0	1236	1232	1221	1202	1188	1180	1180	1199	1241	1305

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CANDELA TABULATION - (Cont.)

26.5	1234	1226	1221	1198	1190	1183	1181	1189	1232	1283
27.0	1232	1225	1217	1201	1186	1184	1181	1187	1226	1274
27.5	1230	1223	1221	1204	1192	1184	1184	1189	1216	1259
28.0	1236	1229	1224	1209	1193	1182	1185	1191	1203	1247
28.5	1242	1235	1230	1221	1203	1186	1185	1190	1200	1243
29.0	1249	1251	1243	1234	1210	1190	1185	1192	1197	1225
29.5	1255	1255	1252	1247	1224	1204	1185	1186	1196	1215
30.0	1270	1272	1267	1262	1233	1210	1186	1185	1195	1203
30.5	1303	1296	1285	1279	1255	1223	1192	1182	1194	1194
31.0	1377	1351	1320	1309	1274	1238	1201	1181	1187	1196
31.5	1428	1449	1381	1356	1298	1262	1210	1179	1179	1189
32.0	1453	1516	1448	1430	1339	1285	1221	1181	1171	1184
32.5	1527	1584	1503	1519	1393	1312	1242	1180	1165	1185
33.0	1564	1581	1557	1592	1461	1339	1256	1187	1157	1172
33.5	1626	1643	1619	1632	1512	1416	1284	1190	1151	1160
34.0	1693	1718	1707	1679	1615	1497	1312	1211	1148	1156
34.5	1851	1852	1829	1783	1669	1506	1336	1224	1154	1151
35.0	1967	1979	1953	1877	1764	1606	1424	1236	1153	1139
35.5	2101	2103	2064	1984	1847	1663	1508	1262	1153	1132
36.0	2240	2244	2202	2118	1960	1730	1545	1316	1185	1130
36.5	2384	2384	2335	2258	2094	1839	1617	1357	1192	1130
37.0	2521	2514	2457	2361	2201	1938	1657	1422	1218	1126
37.5	2775	2750	2677	2514	2334	2018	1723	1469	1241	1132
38.0	3001	2975	2859	2691	2477	2187	1855	1545	1283	1142
38.5	3137	3110	3031	2878	2639	2290	1898	1611	1359	1164
39.0	3298	3291	3213	3038	2793	2454	2024	1722	1435	1200
39.5	3483	3483	3382	3207	2943	2582	2147	1803	1479	1206
40.0	3687	3679	3594	3397	3126	2719	2281	1907	1565	1287
40.5	3908	3894	3796	3610	3327	2964	2428	2019	1637	1318
41.0	4134	4112	3994	3801	3494	3120	2598	2153	1739	1357
41.5	4386	4347	4224	4027	3701	3307	2759	2281	1865	1440
42.0	4597	4572	4459	4261	3941	3537	2944	2431	1943	1509
42.5	4799	4786	4651	4442	4128	3706	3157	2613	2081	1598
43.0	5110	5086	4943	4677	4351	3830	3352	2773	2256	1688
43.5	5473	5444	5272	4991	4594	3968	3593	2981	2339	1778
44.0	5885	5827	5625	5253	4849	4018	3739	3108	2477	1873
44.5	6258	6189	5946	5572	5125	4578	3888	3336	2654	1989
45.0	6730	6674	6405	5986	5441	4838	4040	3588	2809	2114
45.5	7178	7120	6869	6384	5787	5071	4125	3739	2975	2229
46.0	7463	7415	7209	6803	6200	5466	4485	3918	3177	2381
46.5	7654	7622	7501	7227	6662	5846	4981	4010	3320	2481
47.0	7814	7767	7641	7452	7019	6217	5253	4103	3483	2667
47.5	7964	7911	7767	7640	7378	6708	5760	4352	3789	2751
48.0	8256	8199	7978	7762	7546	6976	6044	4824	3875	2953
48.5	8490	8456	8224	7954	7699	7329	6550	5344	4023	3138
49.0	8638	8627	8486	8238	7918	7563	6901	5694	4155	3323
49.5	8697	8675	8594	8425	8123	7733	7190	6025	4241	3421
50.0	8734	8702	8633	8535	8342	7946	7376	6383	4448	3708
50.5	8878	8836	8710	8596	8501	8161	7627	6763	4626	3908
51.0	9042	9006	8854	8662	8573	8309	7759	6908	5621	3959
51.5	9162	9144	9006	8798	8665	8454	7961	7166	5971	4214
52.0	9307	9265	9143	8963	8779	8588	8157	7429	6329	4253
52.5	9404	9390	9273	9109	8934	8659	8237	7503	6434	4406
53.0	9495	9472	9373	9229	9072	8798	8400	7649	6545	4493
53.5	9526	9512	9437	9337	9223	8958	8470	7789	6842	4648
54.0	9581	9573	9499	9412	9317	9067	8608	7919	6902	4848

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CANDELA TABULATION - (Cont.)

54.5	9671	9661	9590	9488	9411	9169	8688	8015	7106	5808
55.0	9724	9720	9667	9572	9477	9295	8850	8175	7312	5983
55.5	9741	9747	9701	9664	9560	9354	8892	8185	7279	6033
56.0	9760	9760	9725	9710	9634	9427	9019	8330	7447	6218
56.5	9720	9730	9750	9741	9727	9544	9094	8436	7464	6201
57.0	9623	9657	9702	9751	9751	9601	9167	8518	7555	6292
57.5	9568	9586	9622	9698	9758	9678	9234	8531	7667	6408
58.0	9505	9516	9555	9639	9740	9694	9269	8581	7803	6462
58.5	9467	9472	9484	9547	9701	9681	9311	8615	7761	6520
59.0	9421	9422	9426	9489	9626	9671	9363	8709	7874	6569
59.5	9349	9352	9367	9447	9564	9645	9335	8684	7805	6602
60.0	9231	9253	9282	9396	9512	9575	9352	8713	7736	6524
60.5	9154	9168	9195	9293	9432	9530	9314	8709	7821	6636
61.0	8989	9028	9065	9170	9330	9472	9238	8753	7898	6631
61.5	8835	8843	8895	9012	9235	9402	9193	8671	7797	6605
62.0	8551	8588	8682	8854	9065	9266	9171	8677	7859	6568
62.5	8238	8287	8424	8661	8936	9124	9034	8580	7734	6538
63.0	7928	7966	8112	8369	8740	8964	8917	8517	7598	6394
63.5	7602	7645	7802	8038	8456	8779	8777	8444	7619	6443
64.0	7307	7360	7502	7789	8196	8573	8621	8350	7651	6382
64.5	6991	7028	7165	7463	7897	8313	8459	8217	7580	6360
65.0	6644	6687	6821	7122	7561	8038	8232	8078	7479	6288
65.5	6414	6458	6584	6836	7262	7740	7958	7928	7275	6126
66.0	6142	6178	6332	6564	6956	7436	7724	7766	7175	6060
66.5	5860	5913	6061	6331	6732	7174	7423	7522	7058	6026
67.0	5589	5629	5763	6052	6464	6911	7149	7270	6924	5932
67.5	5321	5357	5488	5772	6181	6622	6857	7008	6797	5827
68.0	5081	5111	5232	5482	5909	6365	6573	6721	6521	5706
68.5	4868	4888	5005	5251	5647	6066	6304	6445	6249	5509
69.0	4664	4684	4788	5019	5354	5777	6048	6185	6052	5433
69.5	4496	4525	4612	4810	5164	5540	5754	5888	5781	5219
70.0	4361	4368	4435	4620	4941	5304	5479	5605	5498	5006
70.5	4173	4182	4235	4414	4733	5068	5235	5346	5269	4860
71.0	4013	4016	4070	4225	4532	4879	5003	5104	4995	4449
71.5	3889	3889	3934	4055	4337	4635	4764	4825	4713	4063
72.0	3746	3754	3797	3903	4134	4410	4545	4578	4479	3971
72.5	3597	3604	3643	3749	3990	4230	4319	4350	4253	3872
73.0	3453	3456	3494	3587	3835	4051	4099	4108	3870	3715
73.5	3272	3277	3321	3428	3655	3867	3914	3840	3777	3496
74.0	3114	3119	3170	3276	3498	3677	3719	3701	3544	3304
74.5	2988	2993	3028	3109	3328	3497	3516	3489	3331	3101
75.0	2816	2824	2855	2946	3188	3341	3341	3276	3122	2912
75.5	2663	2668	2689	2783	2996	3174	3158	3082	2915	2705
76.0	2508	2510	2533	2623	2816	2993	2984	2884	2740	2532
76.5	2346	2345	2368	2454	2650	2818	2810	2710	2566	2358
77.0	2188	2189	2214	2292	2480	2653	2645	2523	2370	2180
77.5	2029	2032	2057	2142	2319	2479	2482	2356	2200	2027
78.0	1857	1861	1891	1986	2163	2320	2327	2212	2053	1876
78.5	1713	1717	1745	1825	2001	2162	2161	2040	1878	1712
79.0	1578	1584	1607	1683	1846	1996	2011	1886	1725	1579
79.5	1444	1450	1472	1541	1699	1842	1861	1760	1599	1449
80.0	1304	1310	1339	1409	1561	1694	1717	1613	1459	1312
80.5	1183	1190	1214	1283	1426	1558	1570	1475	1327	1200
81.0	1070	1075	1097	1158	1292	1408	1430	1350	1212	1080
81.5	960	966	987	1041	1168	1278	1292	1217	1084	959
82.0	856	860	880	933	1049	1151	1164	1091	968	859

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82.5	757	760	776	823	930	1024	1044	978	864	750
83.0	654	658	682	730	829	912	927	865	759	653
83.5	573	577	592	626	710	794	805	750	654	568
84.0	489	494	508	540	618	685	697	640	552	470
84.5	411	414	426	457	523	583	585	534	458	392
85.0	340	343	352	376	431	480	480	439	373	312
85.5	273	276	282	300	345	382	382	342	284	237
86.0	211	212	218	233	267	295	289	258	213	176
86.5	157	157	161	169	195	214	211	187	150	121
87.0	109	109	112	117	132	145	143	123	97	76
87.5	68	68	69	72	80	85	81	71	54	42
88.0	35	35	35	36	39	40	36	28	20	14
88.5	9	10	10	10	11	11	10	7	5	4
89.0	2	1	1	2	2	2	2	2	3	3
89.5	1	1	1	2	2	2	2	2	2	3
90.0	0	0	0	0	0	0	0	0	0	0

Vert. Angles	Horizontal Angles									
	<u>50</u>	<u>55</u>	<u>60</u>	<u>65</u>	<u>70</u>	<u>75</u>	<u>80</u>	<u>85</u>	<u>90</u>	<u>95</u>
0.0	2353	2353	2353	2353	2353	2353	2353	2353	2353	2353
0.5	2306	2313	2316	2319	2321	2325	2336	2353	2374	2391
1.0	2273	2288	2304	2317	2323	2321	2329	2349	2376	2397
1.5	2225	2247	2273	2297	2313	2315	2320	2340	2369	2390
2.0	2180	2205	2234	2270	2299	2310	2315	2329	2365	2385
2.5	2148	2166	2195	2229	2271	2295	2307	2320	2360	2379
3.0	2135	2135	2149	2193	2240	2280	2296	2303	2344	2372
3.5	2124	2126	2130	2157	2209	2261	2289	2293	2340	2359
4.0	2104	2121	2123	2139	2188	2229	2278	2279	2324	2352
4.5	2093	2094	2114	2117	2160	2223	2269	2270	2323	2345
5.0	2083	2086	2101	2111	2138	2201	2259	2261	2313	2333
5.5	2093	2076	2086	2104	2115	2175	2244	2259	2301	2329
6.0	2089	2073	2069	2087	2100	2151	2230	2253	2311	2310
6.5	2070	2081	2062	2071	2091	2122	2205	2249	2276	2316
7.0	2048	2073	2052	2058	2080	2098	2171	2240	2263	2307
7.5	2023	2052	2062	2046	2069	2085	2157	2233	2259	2305
8.0	1996	2026	2053	2037	2048	2072	2148	2229	2281	2284
8.5	1987	2004	2038	2039	2038	2061	2129	2218	2261	2269
9.0	1966	1975	2017	2040	2029	2056	2122	2202	2243	2255
9.5	1934	1964	2001	2035	2011	2043	2090	2186	2228	2246
10.0	1896	1954	1974	2020	2001	2029	2075	2184	2226	2241
10.5	1862	1939	1959	2009	1997	2013	2057	2168	2198	2239
11.0	1852	1911	1947	1992	1994	2007	2040	2146	2181	2233
11.5	1842	1865	1937	1971	1991	2002	2033	2148	2197	2231
12.0	1804	1847	1926	1957	1996	1987	2019	2135	2202	2249
12.5	1800	1841	1891	1939	1978	1969	2000	2101	2161	2209
13.0	1765	1833	1870	1930	1975	1958	1985	2064	2127	2175
13.5	1736	1820	1841	1916	1957	1949	1975	2065	2127	2185
14.0	1713	1793	1828	1904	1938	1944	1961	2050	2106	2172
14.5	1700	1767	1825	1878	1923	1930	1944	2018	2095	2170
15.0	1674	1726	1809	1855	1911	1922	1930	2013	2082	2168
15.5	1667	1719	1799	1828	1899	1916	1918	1991	2061	2150
16.0	1660	1703	1786	1819	1888	1910	1896	1962	2034	2124
16.5	1643	1689	1758	1798	1877	1897	1876	1932	2008	2091
17.0	1623	1674	1726	1799	1860	1887	1862	1912	1991	2082
17.5	1604	1659	1701	1791	1839	1871	1852	1929	1994	2082

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18.0	1582	1648	1695	1778	1818	1862	1839	1898	1962	2066
18.5	1572	1635	1689	1769	1795	1852	1828	1873	1948	2052
19.0	1549	1619	1677	1752	1779	1834	1812	1869	1940	2027
19.5	1538	1614	1664	1723	1759	1820	1799	1837	1912	2005
20.0	1524	1604	1659	1703	1749	1811	1792	1813	1890	1980
20.5	1497	1582	1654	1692	1746	1802	1781	1808	1888	1965
21.0	1474	1562	1633	1683	1743	1789	1775	1787	1872	1944
21.5	1461	1551	1625	1675	1735	1785	1774	1775	1845	1930
22.0	1453	1544	1626	1671	1733	1775	1769	1762	1839	1910
22.5	1440	1525	1618	1672	1730	1763	1761	1743	1823	1897
23.0	1424	1508	1607	1669	1723	1760	1749	1738	1803	1881
23.5	1423	1504	1597	1667	1699	1741	1749	1724	1797	1863
24.0	1416	1489	1591	1663	1689	1733	1747	1709	1783	1844
24.5	1412	1474	1584	1660	1692	1737	1729	1697	1759	1823
25.0	1414	1479	1578	1661	1691	1727	1729	1683	1743	1807
25.5	1428	1471	1572	1661	1683	1719	1737	1679	1726	1788
26.0	1422	1464	1563	1663	1689	1717	1729	1669	1710	1777
26.5	1397	1464	1553	1657	1701	1718	1722	1657	1709	1765
27.0	1385	1470	1550	1660	1706	1727	1720	1646	1686	1740
27.5	1356	1483	1544	1656	1719	1724	1715	1635	1680	1738
28.0	1351	1482	1541	1654	1715	1728	1715	1629	1648	1719
28.5	1331	1483	1545	1654	1718	1715	1712	1625	1641	1703
29.0	1311	1507	1556	1664	1724	1717	1708	1615	1630	1693
29.5	1301	1464	1547	1654	1722	1714	1701	1602	1606	1673
30.0	1283	1431	1552	1644	1723	1713	1696	1592	1600	1657
30.5	1272	1432	1550	1651	1725	1710	1686	1583	1590	1656
31.0	1267	1404	1558	1644	1724	1704	1679	1570	1561	1632
31.5	1241	1383	1582	1639	1728	1703	1667	1557	1548	1612
32.0	1228	1344	1567	1634	1718	1700	1655	1539	1530	1604
32.5	1222	1333	1557	1630	1716	1701	1647	1535	1509	1584
33.0	1205	1313	1514	1625	1705	1694	1624	1507	1502	1574
33.5	1196	1280	1501	1622	1699	1684	1606	1487	1484	1563
34.0	1191	1279	1470	1610	1677	1664	1590	1482	1464	1552
34.5	1183	1260	1449	1604	1656	1657	1562	1459	1449	1540
35.0	1172	1228	1408	1580	1630	1628	1540	1442	1429	1527
35.5	1157	1218	1376	1562	1599	1591	1512	1426	1409	1507
36.0	1145	1202	1345	1547	1571	1568	1476	1387	1394	1513
36.5	1136	1173	1314	1536	1542	1530	1446	1375	1376	1477
37.0	1125	1159	1279	1497	1504	1497	1415	1360	1369	1484
37.5	1110	1149	1263	1480	1466	1451	1382	1330	1354	1480
38.0	1096	1133	1230	1424	1429	1410	1345	1315	1334	1454
38.5	1093	1116	1200	1372	1398	1378	1317	1291	1327	1463
39.0	1093	1096	1164	1337	1363	1330	1281	1268	1318	1464
39.5	1091	1072	1138	1285	1326	1285	1247	1247	1302	1446
40.0	1090	1066	1115	1233	1294	1247	1217	1229	1300	1452
40.5	1107	1048	1084	1196	1250	1204	1182	1207	1284	1450
41.0	1120	1040	1064	1144	1217	1165	1153	1187	1273	1441
41.5	1141	1023	1040	1100	1180	1127	1124	1178	1276	1451
42.0	1184	1038	1017	1067	1135	1092	1098	1156	1258	1437
42.5	1208	1043	994	1026	1124	1062	1074	1142	1250	1440
43.0	1270	1045	978	992	1089	1034	1051	1135	1256	1453
43.5	1341	1065	961	972	1056	1005	1035	1119	1240	1462
44.0	1411	1088	958	983	1019	979	1015	1107	1235	1440
44.5	1471	1115	949	943	970	966	996	1097	1246	1463
45.0	1547	1170	949	929	939	953	986	1089	1230	1447
45.5	1632	1207	966	922	903	943	967	1073	1227	1451

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46.0	1705	1259	959	908	881	909	961	1076	1220	1454
46.5	1797	1323	997	900	859	896	957	1067	1218	1453
47.0	1910	1370	1007	899	835	882	949	1045	1214	1449
47.5	1954	1419	1018	891	819	866	939	1048	1206	1448
48.0	2090	1486	1061	884	802	858	938	1046	1208	1446
48.5	2219	1563	1129	905	782	855	896	1026	1205	1445
49.0	2346	1639	1166	898	773	851	891	1030	1195	1418
49.5	2476	1716	1184	905	758	833	879	1017	1168	1433
50.0	2615	1798	1268	929	750	839	867	1006	1179	1420
50.5	2755	1834	1290	932	779	819	857	996	1172	1438
51.0	2829	1921	1351	939	881	806	839	999	1182	1413
51.5	2999	2013	1389	968	853	782	835	976	1158	1409
52.0	3263	2103	1433	998	851	768	824	963	1165	1421
52.5	3417	2277	1531	1049	850	757	809	948	1136	1389
53.0	3598	2383	1556	1086	861	726	793	931	1107	1379
53.5	3829	2524	1667	1125	856	718	783	918	1111	1366
54.0	4038	2565	1684	1156	865	703	770	904	1088	1359
54.5	4005	2780	1797	1197	880	695	757	891	1088	1346
55.0	4254	2790	1792	1221	877	687	735	860	1088	1330
55.5	4179	3036	1927	1294	894	717	718	854	1054	1320
56.0	4200	3156	1934	1293	893	710	706	831	1015	1301
56.5	4336	3278	2075	1365	913	669	695	812	1011	1281
57.0	4463	3531	2260	1363	941	719	680	781	976	1245
57.5	4496	3541	2275	1446	956	711	668	760	954	1248
58.0	4486	3572	2306	1452	956	822	653	751	947	1249
58.5	4554	3665	2388	1485	981	833	639	723	914	1200
59.0	4515	3748	2468	1525	995	818	628	700	906	1192
59.5	4576	3914	2623	1571	972	827	617	679	863	1143
60.0	4527	3861	2608	1610	991	823	604	648	821	1143
60.5	4967	3893	2660	1641	990	826	588	637	812	1091
61.0	4583	3915	2710	1677	1031	822	570	618	802	1086
61.5	4996	3832	2746	1704	1036	848	556	595	759	1031
62.0	4887	3850	2776	1744	1046	828	541	572	747	1022
62.5	4970	3936	2872	1769	1011	800	525	554	705	968
63.0	4564	3924	2791	1779	1051	823	512	528	671	922
63.5	4912	3910	2867	1791	1031	804	494	518	660	909
64.0	4556	3840	2815	1831	1069	811	483	493	632	873
64.5	4510	3897	2728	1775	1028	838	468	479	609	839
65.0	4456	3850	2696	1767	1028	807	456	458	580	819
65.5	4399	3806	2745	1819	1066	829	443	436	543	763
66.0	4327	3752	2705	1795	1014	793	432	420	520	711
66.5	4381	3699	2674	1723	1008	818	415	407	506	693
67.0	4309	3595	2590	1725	1012	778	410	386	471	657
67.5	4225	3534	2542	1697	1005	775	403	374	461	624
68.0	4213	3531	2493	1666	997	774	386	355	430	601
68.5	4118	3383	2437	1628	975	789	383	339	410	554
69.0	4099	3380	2446	1590	959	618	366	325	388	524
69.5	4082	3232	2322	1550	931	754	357	313	369	506
70.0	4035	3143	2198	1506	944	748	356	298	349	468
70.5	3908	3053	2190	1461	921	595	345	285	337	451
71.0	3847	3030	2125	1416	895	489	327	272	313	425
71.5	3687	2863	2050	1362	896	490	326	261	293	390
72.0	3579	2825	2032	1309	868	459	307	249	284	369
72.5	3411	2651	1896	1256	874	466	301	239	267	344
73.0	3260	2520	1796	1179	840	451	291	227	253	322
73.5	3040	2427	1771	1120	840	419	281	215	238	299

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74.0	2880	2305	1691	1107	827	402	270	205	221	278
74.5	2714	2189	1602	1040	633	384	259	196	210	257
75.0	2566	2019	1478	955	579	365	247	185	199	242
75.5	2369	1934	1427	938	567	348	235	174	181	219
76.0	2247	1843	1332	874	507	329	223	165	169	202
76.5	2101	1691	1243	819	494	317	210	154	159	189
77.0	1932	1581	1162	766	461	298	204	146	146	169
77.5	1813	1505	1086	715	416	273	187	135	135	157
78.0	1661	1375	1006	663	402	262	176	125	126	143
78.5	1524	1275	934	614	372	245	169	119	114	129
79.0	1406	1195	864	565	332	222	153	109	105	119
79.5	1272	1074	791	517	315	210	143	99	96	107
80.0	1153	979	723	453	286	193	135	93	87	95
80.5	1048	897	671	425	251	172	120	84	78	85
81.0	932	791	586	382	233	160	110	74	70	76
81.5	829	703	521	327	203	141	99	68	62	67
82.0	735	623	452	293	180	125	88	59	55	59
82.5	641	544	404	254	157	113	78	53	47	51
83.0	555	469	350	228	136	96	67	46	41	43
83.5	475	401	291	188	117	82	58	38	34	37
84.0	396	333	248	163	98	69	49	33	29	31
84.5	327	270	201	132	80	57	40	27	24	25
85.0	254	211	156	103	65	46	32	21	19	21
85.5	194	159	118	79	48	35	25	17	15	16
86.0	142	115	83	57	35	25	18	12	11	12
86.5	95	74	55	38	24	17	12	8	8	9
87.0	58	44	33	23	13	10	7	6	6	6
87.5	32	24	19	12	7	5	4	4	4	4
88.0	13	8	8	6	4	3	3	2	2	3
88.5	4	4	4	3	2	2	2	2	2	2
89.0	3	3	3	2	2	2	2	1	1	2
89.5	3	3	3	2	2	2	2	1	1	2
90.0	0	0	0	0	0	0	0	0	0	0

Vert. Angles	Horizontal Angles									
	<u>100</u>	<u>105</u>	<u>110</u>	<u>115</u>	<u>120</u>	<u>125</u>	<u>130</u>	<u>135</u>	<u>140</u>	<u>145</u>
0.0	2353	2353	2353	2353	2353	2353	2353	2353	2353	2353
0.5	2403	2404	2392	2384	2383	2393	2412	2432	2456	2472
1.0	2404	2391	2375	2377	2406	2443	2480	2500	2502	2491
1.5	2392	2373	2367	2403	2455	2491	2492	2469	2445	2436
2.0	2376	2362	2394	2455	2491	2472	2440	2426	2444	2477
2.5	2361	2366	2428	2486	2468	2429	2431	2473	2511	2527
3.0	2351	2389	2468	2467	2429	2430	2482	2517	2522	2519
3.5	2348	2416	2466	2435	2426	2478	2512	2512	2513	2543
4.0	2348	2424	2448	2417	2469	2501	2499	2514	2560	2598
4.5	2337	2443	2431	2414	2482	2490	2501	2558	2601	2609
5.0	2349	2449	2401	2449	2487	2478	2538	2589	2600	2631
5.5	2350	2433	2386	2466	2474	2505	2572	2592	2632	2675
6.0	2379	2405	2392	2470	2471	2529	2572	2591	2653	2682
6.5	2350	2396	2400	2457	2493	2555	2577	2645	2680	2752
7.0	2376	2362	2424	2446	2517	2550	2620	2668	2753	2837
7.5	2371	2352	2433	2460	2528	2579	2632	2722	2822	2862
8.0	2390	2355	2421	2476	2523	2600	2642	2753	2841	2873
8.5	2378	2358	2413	2476	2515	2594	2671	2803	2857	2880
9.0	2365	2351	2404	2485	2532	2599	2737	2822	2851	2899

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9.5	2350	2345	2398	2476	2552	2644	2774	2826	2855	2994
10.0	2319	2351	2392	2473	2555	2686	2784	2825	2906	3052
10.5	2293	2342	2392	2483	2578	2720	2799	2844	3007	3048
11.0	2289	2344	2407	2486	2584	2733	2791	2907	3029	3029
11.5	2258	2339	2405	2485	2599	2734	2785	2955	3007	3033
12.0	2253	2322	2399	2495	2623	2727	2793	2981	2986	3016
12.5	2239	2305	2395	2500	2652	2715	2907	2959	2987	3020
13.0	2229	2303	2392	2521	2662	2725	2924	2955	2973	3114
13.5	2225	2294	2391	2527	2649	2749	2916	2945	2986	3168
14.0	2203	2279	2382	2550	2647	2815	2901	2924	3061	3188
14.5	2203	2280	2395	2563	2637	2837	2888	2939	3133	3193
15.0	2202	2272	2379	2554	2636	2844	2878	2967	3139	3187
15.5	2186	2259	2367	2555	2649	2828	2864	3013	3142	3197
16.0	2167	2245	2364	2555	2724	2812	2891	3092	3140	3253
16.5	2169	2239	2368	2536	2755	2807	2949	3094	3152	3303
17.0	2146	2227	2401	2521	2737	2790	2987	3089	3177	3322
17.5	2133	2214	2383	2516	2734	2771	2999	3074	3208	3307
18.0	2119	2195	2393	2518	2713	2759	3027	3090	3259	3323
18.5	2104	2189	2379	2544	2695	2808	3015	3129	3251	3355
19.0	2079	2197	2372	2563	2688	2841	2996	3144	3249	3368
19.5	2059	2172	2357	2568	2675	2894	2997	3196	3278	3437
20.0	2047	2184	2355	2576	2657	2899	3009	3189	3321	3475
20.5	2037	2183	2350	2567	2659	2909	3028	3186	3345	3470
21.0	2011	2176	2339	2558	2665	2905	3077	3211	3389	3515
21.5	1994	2189	2346	2554	2713	2894	3103	3244	3429	3615
22.0	1994	2185	2346	2540	2744	2899	3112	3258	3461	3641
22.5	1969	2167	2337	2552	2774	2939	3131	3322	3524	3642
23.0	1956	2167	2381	2539	2799	2951	3140	3354	3583	3700
23.5	1941	2142	2372	2539	2812	2992	3159	3365	3589	3749
24.0	1930	2128	2375	2526	2796	2999	3168	3422	3596	3780
24.5	1922	2129	2378	2533	2793	3019	3196	3447	3641	3835
25.0	1904	2104	2358	2542	2786	3038	3253	3499	3673	3924
25.5	1894	2095	2356	2558	2788	3071	3317	3547	3737	3985
26.0	1884	2122	2342	2621	2856	3083	3325	3541	3759	4010
26.5	1886	2100	2354	2617	2854	3101	3371	3577	3844	4081
27.0	1863	2087	2340	2617	2874	3100	3412	3608	3889	4139
27.5	1877	2093	2320	2623	2901	3142	3437	3639	3904	4180
28.0	1855	2071	2341	2620	2917	3177	3464	3712	3965	4272
28.5	1842	2067	2339	2614	2927	3205	3475	3768	4022	4349
29.0	1845	2082	2314	2616	2938	3252	3487	3792	4074	4395
29.5	1826	2063	2323	2621	2940	3287	3549	3844	4146	4482
30.0	1816	2055	2346	2635	2943	3310	3587	3875	4198	4548
30.5	1822	2068	2339	2640	2953	3337	3612	3903	4232	4589
31.0	1790	2039	2336	2657	2983	3341	3675	3985	4313	4659
31.5	1776	2030	2341	2661	3000	3344	3711	4041	4383	4690
32.0	1767	2034	2348	2677	3024	3355	3726	4072	4432	4714
32.5	1758	2029	2328	2666	3035	3399	3787	4155	4507	4844
33.0	1753	2001	2346	2700	3094	3424	3781	4170	4511	4894
33.5	1748	2035	2344	2705	3103	3442	3812	4216	4552	4940
34.0	1736	2010	2320	2686	3090	3468	3906	4322	4625	4913
34.5	1729	1986	2321	2725	3131	3513	3934	4337	4691	4907
35.0	1729	2036	2358	2734	3144	3536	3938	4358	4771	4955
35.5	1724	2011	2315	2729	3143	3560	3994	4385	4751	4963
36.0	1734	2001	2352	2739	3145	3542	3994	4392	4714	4963
36.5	1709	2015	2353	2757	3151	3567	4035	4476	4744	4980
37.0	1708	1998	2334	2774	3163	3642	4105	4514	4754	4999

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37.5	1729	2015	2369	2786	3187	3644	4094	4501	4768	5023
38.0	1700	2011	2374	2801	3210	3680	4098	4493	4783	4993
38.5	1701	1992	2348	2795	3256	3719	4129	4487	4790	4990
39.0	1712	2027	2399	2816	3225	3694	4111	4467	4811	4997
39.5	1732	2030	2411	2834	3237	3727	4127	4506	4845	4985
40.0	1708	2004	2386	2814	3297	3803	4171	4499	4798	4915
40.5	1717	2043	2429	2842	3272	3774	4131	4452	4781	4851
41.0	1704	2031	2416	2835	3287	3769	4122	4488	4786	4805
41.5	1707	2042	2423	2821	3313	3765	4139	4507	4727	4752
42.0	1767	2079	2456	2859	3315	3751	4149	4492	4681	4704
42.5	1723	2055	2430	2821	3317	3734	4134	4450	4638	4645
43.0	1729	2036	2441	2828	3325	3746	4117	4400	4563	4562
43.5	1770	2086	2464	2882	3354	3749	3947	4358	4493	4482
44.0	1750	2068	2471	2857	3354	3726	3952	4324	4452	4403
44.5	1761	2106	2487	2867	3316	3691	3914	4275	4380	4309
45.0	1770	2090	2463	2876	3323	3712	3927	4243	4299	4234
45.5	1774	2096	2487	2882	3276	3700	3927	4169	4200	4151
46.0	1779	2132	2488	2877	3256	3642	3871	4097	4109	4076
46.5	1784	2109	2462	2867	3259	3620	3853	4033	4037	3989
47.0	1775	2107	2487	2866	3220	3588	3825	3967	3943	3862
47.5	1774	2139	2484	2852	3202	3530	3810	3847	3863	3745
48.0	1778	2114	2459	2841	3197	3519	3744	3810	3779	3630
48.5	1778	2116	2478	2823	3148	3483	3671	3740	3698	3486
49.0	1794	2140	2471	2806	3111	3423	3569	3647	3573	3352
49.5	1769	2134	2458	2786	3080	3370	3493	3565	3453	3215
50.0	1755	2114	2438	2763	3042	3307	3422	3479	3329	3077
50.5	1766	2105	2433	2750	3015	3242	3348	3362	3202	2966
51.0	1740	2074	2422	2705	2977	3173	3260	3266	3099	2876
51.5	1729	2060	2404	2698	2938	3113	3181	3167	2986	2764
52.0	1739	2066	2382	2669	2888	3040	3090	3049	2861	2662
52.5	1702	2033	2363	2619	2834	2943	2992	2935	2732	2535
53.0	1711	2040	2342	2587	2765	2851	2905	2831	2637	2458
53.5	1674	2047	2333	2554	2717	2777	2811	2716	2534	2364
54.0	1667	2015	2305	2511	2656	2693	2717	2600	2440	2258
54.5	1651	1968	2259	2467	2594	2611	2619	2487	2344	2172
55.0	1632	1947	2249	2431	2523	2534	2524	2394	2267	2070
55.5	1618	1924	2203	2377	2450	2463	2432	2291	2174	1976
56.0	1598	1896	2186	2337	2378	2380	2329	2194	2084	1870
56.5	1575	1868	2134	2293	2306	2296	2242	2113	1972	1761
57.0	1557	1865	2117	2238	2238	2226	2150	2042	1881	1664
57.5	1541	1817	2077	2183	2167	2146	2053	1957	1810	1603
58.0	1520	1803	2030	2126	2099	2061	1964	1868	1707	1512
58.5	1491	1750	1969	2066	2030	1966	1870	1765	1620	1434
59.0	1475	1724	1925	2006	1962	1883	1788	1681	1542	1365
59.5	1428	1687	1876	1948	1889	1805	1711	1590	1450	1285
60.0	1419	1646	1825	1881	1827	1736	1627	1520	1380	1222
60.5	1387	1621	1787	1822	1761	1664	1561	1460	1306	1163
61.0	1337	1564	1731	1766	1704	1595	1482	1389	1229	1067
61.5	1300	1507	1671	1700	1624	1520	1396	1311	1165	1010
62.0	1280	1479	1626	1638	1551	1436	1332	1246	1095	946
62.5	1225	1421	1578	1579	1491	1381	1257	1168	1025	878
63.0	1194	1398	1522	1517	1422	1308	1197	1102	950	825
63.5	1170	1349	1467	1456	1360	1238	1140	1031	899	785
64.0	1113	1291	1410	1392	1297	1164	1077	965	844	725
64.5	1070	1243	1350	1332	1229	1104	1020	904	800	693
65.0	1043	1197	1296	1275	1167	1050	962	849	753	645

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65.5	987	1152	1242	1209	1115	993	896	784	705	593
66.0	946	1115	1182	1146	1058	941	853	740	661	555
66.5	903	1063	1125	1086	998	889	799	699	629	525
67.0	863	1006	1067	1025	942	836	738	657	586	475
67.5	822	956	1010	974	878	780	686	617	546	445
68.0	787	904	954	912	835	740	649	585	517	413
68.5	746	862	899	863	787	690	602	543	472	376
69.0	694	817	843	806	736	647	565	513	436	353
69.5	664	763	792	761	691	613	532	477	403	327
70.0	616	711	742	716	644	571	500	450	377	300
70.5	586	670	694	669	595	529	464	417	340	279
71.0	547	622	646	624	556	494	435	387	317	257
71.5	510	580	602	580	522	464	410	357	289	236
72.0	478	541	559	540	490	432	383	331	270	220
72.5	439	500	519	502	452	399	354	304	249	201
73.0	406	461	481	465	420	371	327	280	230	184
73.5	380	428	444	432	390	350	307	261	213	169
74.0	346	393	410	396	361	324	281	236	195	151
74.5	319	362	378	367	335	297	259	216	179	136
75.0	297	335	348	337	310	278	242	202	167	127
75.5	269	305	320	309	287	256	221	184	151	114
76.0	247	282	294	284	264	237	204	168	137	103
76.5	229	259	270	261	243	218	189	156	127	96
77.0	208	236	247	238	223	199	171	141	114	87
77.5	190	217	225	218	204	184	158	128	101	77
78.0	173	196	205	198	186	169	143	118	93	71
78.5	156	178	186	181	171	154	131	106	85	65
79.0	142	163	170	164	154	141	118	97	76	58
79.5	128	146	153	148	139	127	107	88	68	53
80.0	115	131	137	133	126	115	97	78	61	48
80.5	103	118	124	119	113	104	87	71	56	44
81.0	91	104	110	106	101	92	77	63	50	40
81.5	80	92	97	94	89	82	69	56	44	36
82.0	70	81	85	83	79	73	62	51	40	33
82.5	60	69	74	72	69	63	54	44	36	30
83.0	51	60	63	62	60	56	48	39	31	27
83.5	44	51	54	53	51	48	42	35	28	25
84.0	36	42	45	45	44	41	36	30	25	23
84.5	30	35	38	38	37	35	31	26	22	21
85.0	25	28	31	31	31	30	27	23	20	19
85.5	19	23	25	26	25	25	22	20	18	17
86.0	15	18	20	20	21	20	18	17	16	16
86.5	11	13	15	16	16	15	15	14	14	14
87.0	8	9	11	12	12	11	12	12	13	13
87.5	5	6	8	8	8	9	10	11	12	12
88.0	3	4	5	6	7	8	9	10	11	12
88.5	2	3	4	5	6	7	9	10	11	12
89.0	2	2	3	4	6	7	9	10	11	12
89.5	2	2	3	5	6	7	9	10	11	12
90.0	0	0	0	0	0	0	0	0	0	0

**Vert.
Angles**

Horizontal Angles

	<u>150</u>	<u>155</u>	<u>160</u>	<u>165</u>	<u>170</u>	<u>175</u>	<u>180</u>
0.0	2353	2353	2353	2353	2353	2353	2353
0.5	2484	2488	2489	2487	2483	2480	2475

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1.0	2473	2457	2442	2434	2428	2427	2421
1.5	2436	2442	2450	2460	2464	2469	2471
2.0	2505	2517	2517	2513	2511	2507	2504
2.5	2524	2515	2511	2513	2514	2517	2510
3.0	2518	2534	2560	2578	2591	2596	2592
3.5	2574	2604	2615	2614	2607	2607	2606
4.0	2612	2617	2621	2634	2647	2655	2665
4.5	2631	2662	2681	2692	2694	2699	2696
5.0	2670	2688	2697	2723	2739	2748	2753
5.5	2692	2726	2773	2813	2834	2866	2872
6.0	2730	2822	2865	2898	2899	2910	2916
6.5	2842	2881	2900	2912	2919	2924	2924
7.0	2878	2901	2915	2926	2923	2933	2943
7.5	2901	2915	2930	2950	2979	3007	3027
8.0	2907	2947	3011	3064	3103	3126	3139
8.5	2924	3027	3107	3130	3128	3136	3145
9.0	3008	3104	3118	3102	3105	3113	3126
9.5	3091	3086	3090	3103	3111	3106	3116
10.0	3068	3080	3096	3084	3090	3098	3110
10.5	3059	3077	3070	3090	3137	3167	3184
11.0	3056	3057	3123	3196	3264	3277	3286
11.5	3032	3102	3222	3285	3297	3289	3290
12.0	3079	3224	3273	3277	3281	3287	3296
12.5	3179	3252	3266	3277	3276	3298	3304
13.0	3224	3240	3265	3284	3314	3336	3351
13.5	3224	3234	3289	3344	3388	3406	3415
14.0	3217	3262	3342	3402	3407	3418	3429
14.5	3228	3317	3393	3405	3401	3406	3412
15.0	3251	3355	3389	3397	3436	3454	3463
15.5	3329	3366	3389	3449	3480	3512	3510
16.0	3348	3367	3435	3488	3524	3564	3569
16.5	3341	3395	3464	3548	3596	3587	3595
17.0	3359	3435	3543	3579	3581	3587	3588
17.5	3397	3499	3568	3575	3648	3700	3708
18.0	3431	3545	3574	3698	3767	3769	3787
18.5	3504	3537	3660	3777	3764	3755	3763
19.0	3518	3602	3747	3741	3762	3799	3797
19.5	3520	3699	3735	3768	3855	3903	3908
20.0	3610	3713	3756	3875	3925	3943	3946
20.5	3663	3712	3865	3925	3952	3979	4007
21.0	3675	3795	3907	3950	4069	4121	4138
21.5	3696	3863	3930	4052	4150	4208	4218
22.0	3752	3895	4014	4147	4212	4233	4239
22.5	3815	3948	4115	4219	4263	4323	4333
23.0	3847	4054	4175	4269	4373	4432	4451
23.5	3925	4118	4224	4359	4472	4512	4538
24.0	3986	4162	4324	4485	4583	4626	4643
24.5	4054	4257	4409	4572	4665	4729	4731
25.0	4116	4335	4482	4638	4735	4792	4795
25.5	4173	4380	4563	4714	4825	4884	4898
26.0	4251	4468	4625	4794	4911	4975	4993
26.5	4322	4526	4715	4901	4990	5023	5047
27.0	4397	4602	4814	4973	5025	5089	5132
27.5	4468	4687	4893	4993	5102	5204	5262
28.0	4525	4755	4915	5098	5264	5340	5374
28.5	4609	4838	4993	5240	5336	5354	5374

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29.0	4705	4863	5119	5297	5320	5340	5370
29.5	4760	4907	5216	5293	5348	5403	5426
30.0	4781	5047	5243	5314	5440	5500	5508
30.5	4838	5135	5229	5364	5487	5513	5500
31.0	4939	5149	5262	5419	5475	5486	5475
31.5	5037	5140	5334	5407	5449	5501	5494
32.0	5070	5180	5357	5384	5488	5535	5542
32.5	5040	5235	5340	5430	5526	5556	5563
33.0	5051	5268	5370	5473	5531	5559	5557
33.5	5075	5234	5384	5468	5537	5552	5551
34.0	5111	5261	5406	5477	5528	5528	5523
34.5	5129	5306	5411	5477	5493	5498	5500
35.0	5128	5310	5420	5441	5463	5493	5488
35.5	5185	5319	5396	5408	5449	5450	5431
36.0	5195	5326	5332	5385	5384	5351	5325
36.5	5167	5311	5312	5335	5269	5249	5235
37.0	5182	5239	5289	5225	5174	5170	5151
37.5	5185	5194	5229	5141	5109	5081	5052
38.0	5158	5169	5130	5073	5036	5001	4959
38.5	5107	5117	5048	4981	4934	4906	4873
39.0	5059	5037	4967	4887	4840	4814	4795
39.5	5020	4965	4890	4804	4750	4731	4710
40.0	4957	4884	4802	4723	4686	4655	4622
40.5	4879	4801	4713	4644	4592	4551	4510
41.0	4801	4729	4623	4552	4472	4409	4357
41.5	4726	4634	4541	4445	4339	4282	4241
42.0	4660	4547	4437	4305	4170	4119	4089
42.5	4555	4459	4320	4165	4025	3920	3900
43.0	4448	4342	4173	4025	3896	3822	3801
43.5	4382	4259	4062	3901	3767	3703	3685
44.0	4295	4146	3912	3764	3641	3591	3569
44.5	4195	4021	3781	3638	3517	3462	3436
45.0	4098	3886	3648	3504	3375	3323	3298
45.5	3976	3735	3502	3365	3245	3213	3196
46.0	3870	3596	3380	3245	3140	3099	3091
46.5	3744	3485	3257	3132	3032	2984	2973
47.0	3571	3337	3136	3026	2946	2896	2874
47.5	3420	3215	3036	2930	2843	2789	2769
48.0	3317	3096	2939	2827	2709	2661	2620
48.5	3191	2994	2846	2716	2588	2532	2491
49.0	3086	2900	2749	2620	2481	2416	2378
49.5	2974	2802	2653	2490	2354	2285	2248
50.0	2862	2703	2527	2372	2213	2148	2114
50.5	2771	2607	2410	2250	2111	2055	2020
51.0	2691	2494	2278	2114	1983	1926	1877
51.5	2587	2359	2140	1985	1875	1813	1775
52.0	2464	2248	2033	1888	1797	1747	1718
52.5	2366	2143	1935	1796	1714	1669	1649
53.0	2271	2046	1831	1721	1641	1595	1579
53.5	2161	1934	1736	1640	1573	1524	1515
54.0	2043	1818	1654	1558	1500	1453	1438
54.5	1954	1722	1581	1491	1431	1378	1360
55.0	1833	1636	1510	1419	1353	1297	1263
55.5	1761	1549	1431	1333	1254	1195	1165
56.0	1643	1487	1370	1263	1173	1116	1081
56.5	1570	1420	1294	1178	1090	1035	1012

IES ROAD REPORT
PHOTOMETRIC FILENAME : L041706608.IES

CANDELA TABULATION - (Cont.)

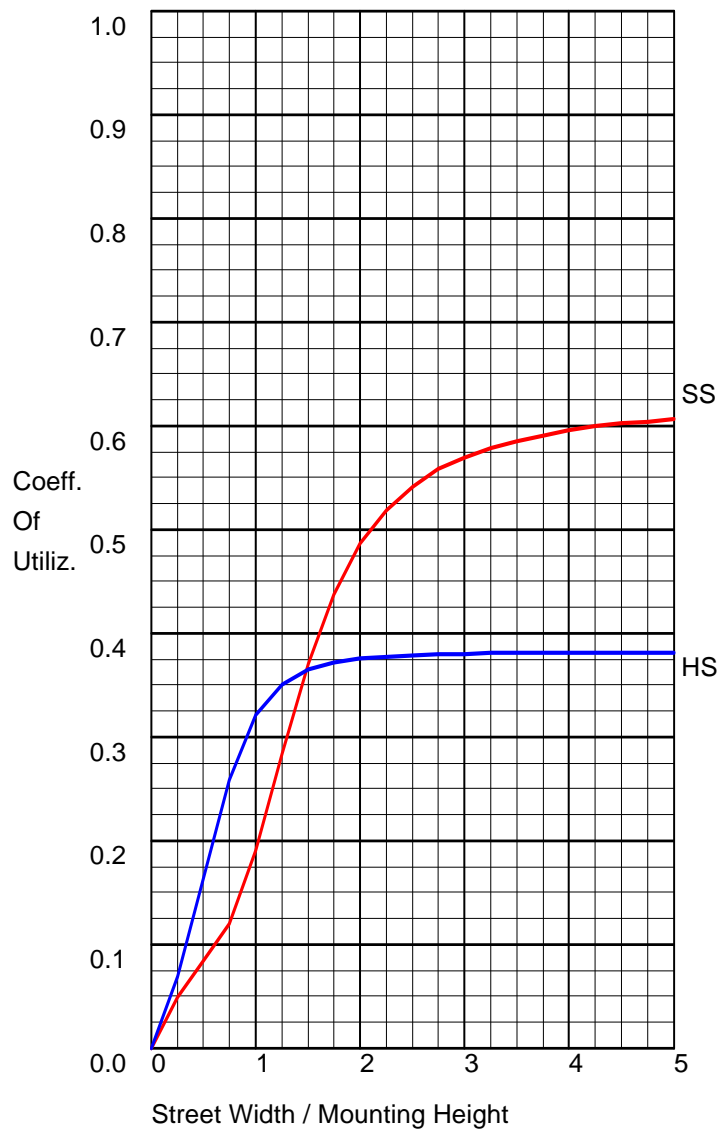
57.0	1486	1344	1209	1096	999	950	931
57.5	1432	1286	1143	1009	932	884	865
58.0	1352	1189	1051	951	878	831	811
58.5	1269	1110	972	882	811	771	751
59.0	1196	1035	913	820	750	708	687
59.5	1124	964	851	764	696	663	647
60.0	1058	900	789	698	638	614	601
60.5	997	846	739	651	600	577	565
61.0	915	777	671	608	571	553	542
61.5	858	726	634	578	541	520	513
62.0	809	675	595	545	511	486	482
62.5	747	628	558	510	476	453	452
63.0	704	592	525	478	442	418	416
63.5	657	554	491	444	407	386	385
64.0	604	514	459	408	376	357	353
64.5	564	480	424	378	345	328	323
65.0	532	449	394	348	319	303	299
65.5	488	417	364	318	292	279	276
66.0	460	392	336	292	266	255	253
66.5	430	366	310	267	243	232	229
67.0	393	334	285	243	225	214	211
67.5	368	307	261	224	205	195	193
68.0	337	283	238	205	186	178	177
68.5	311	259	215	187	170	164	165
69.0	290	239	198	170	156	151	152
69.5	268	219	183	157	142	138	140
70.0	244	195	162	141	133	131	133
70.5	227	181	149	132	124	124	125
71.0	204	165	137	122	117	117	119
71.5	186	152	125	114	111	111	113
72.0	172	139	116	107	105	106	107
72.5	154	124	107	101	100	101	102
73.0	140	114	101	96	95	96	97
73.5	131	104	94	91	90	91	92
74.0	117	96	89	86	85	86	87
74.5	106	89	84	81	81	82	83
75.0	97	83	79	77	76	77	78
75.5	89	78	75	72	72	73	73
76.0	81	73	71	68	68	69	69
76.5	75	68	66	64	64	65	65
77.0	69	64	62	61	60	61	61
77.5	64	60	59	57	57	57	58
78.0	59	56	55	53	53	53	54
78.5	55	52	51	50	49	49	50
79.0	51	49	47	46	46	46	47
79.5	47	45	44	43	43	43	43
80.0	44	42	41	40	40	40	40
80.5	40	39	38	37	37	37	37
81.0	37	36	35	34	34	34	34
81.5	34	33	32	31	31	31	31
82.0	32	30	30	29	29	29	29
82.5	29	28	27	26	26	26	26
83.0	26	26	25	24	24	24	24
83.5	24	24	23	22	22	22	22
84.0	22	22	21	20	20	20	20
84.5	20	20	19	19	18	18	18

IES ROAD REPORT
PHOTOMETRIC FILENAME : L041706608.IES

CANDELA TABULATION - (Cont.)

85.0	19	18	18	17	17	16	16
85.5	17	17	16	16	15	15	15
86.0	16	15	15	14	14	14	14
86.5	14	14	14	13	13	13	12
87.0	13	13	13	12	12	12	12
87.5	12	12	12	12	11	11	11
88.0	12	12	11	11	11	10	10
88.5	12	11	11	11	10	10	10
89.0	12	11	11	10	10	10	10
89.5	12	12	11	11	10	10	10
90.0	0	0	0	0	0	0	0

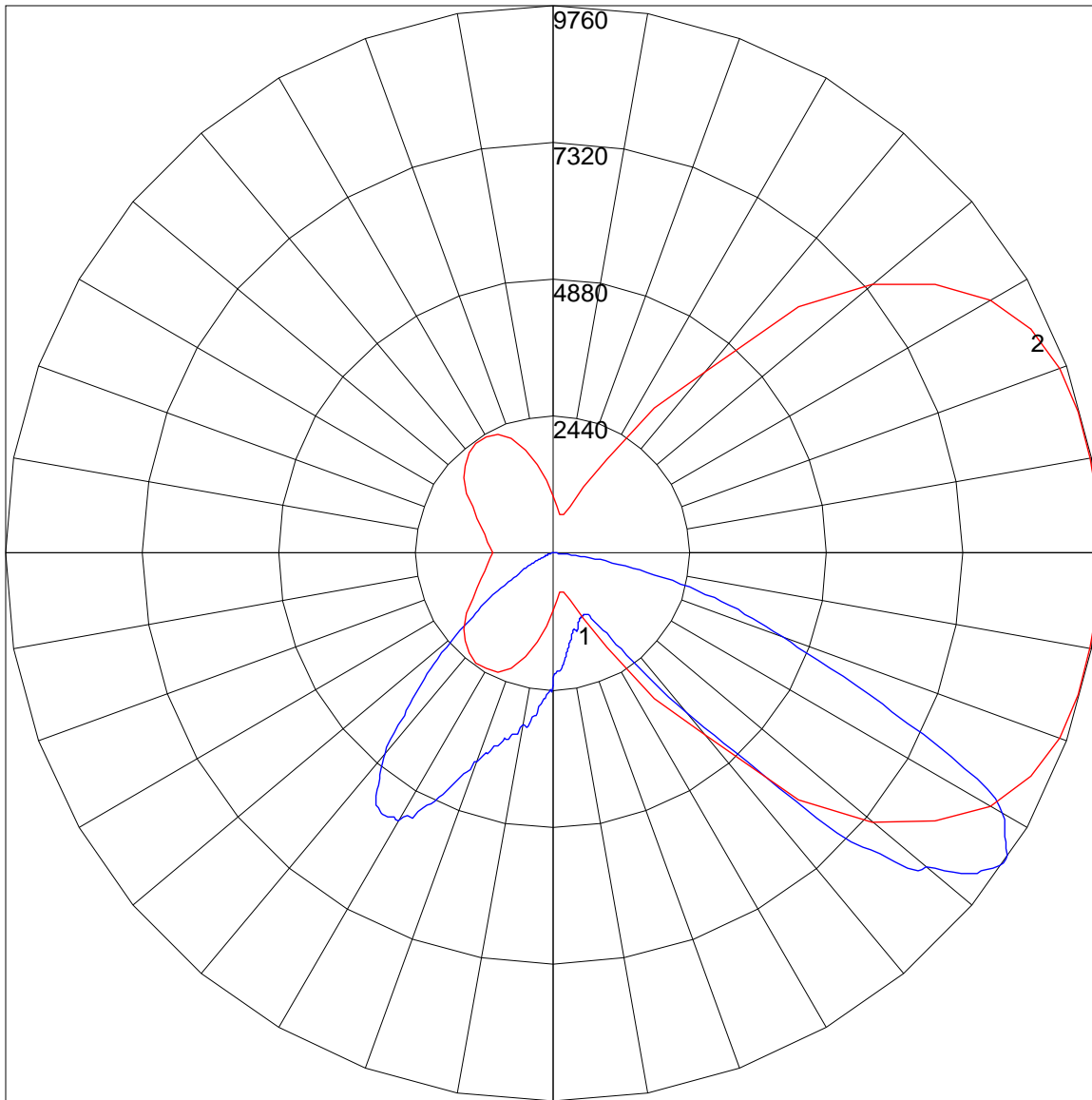
COEFFICIENTS OF UTILIZATION



FLUX DISTRIBUTION

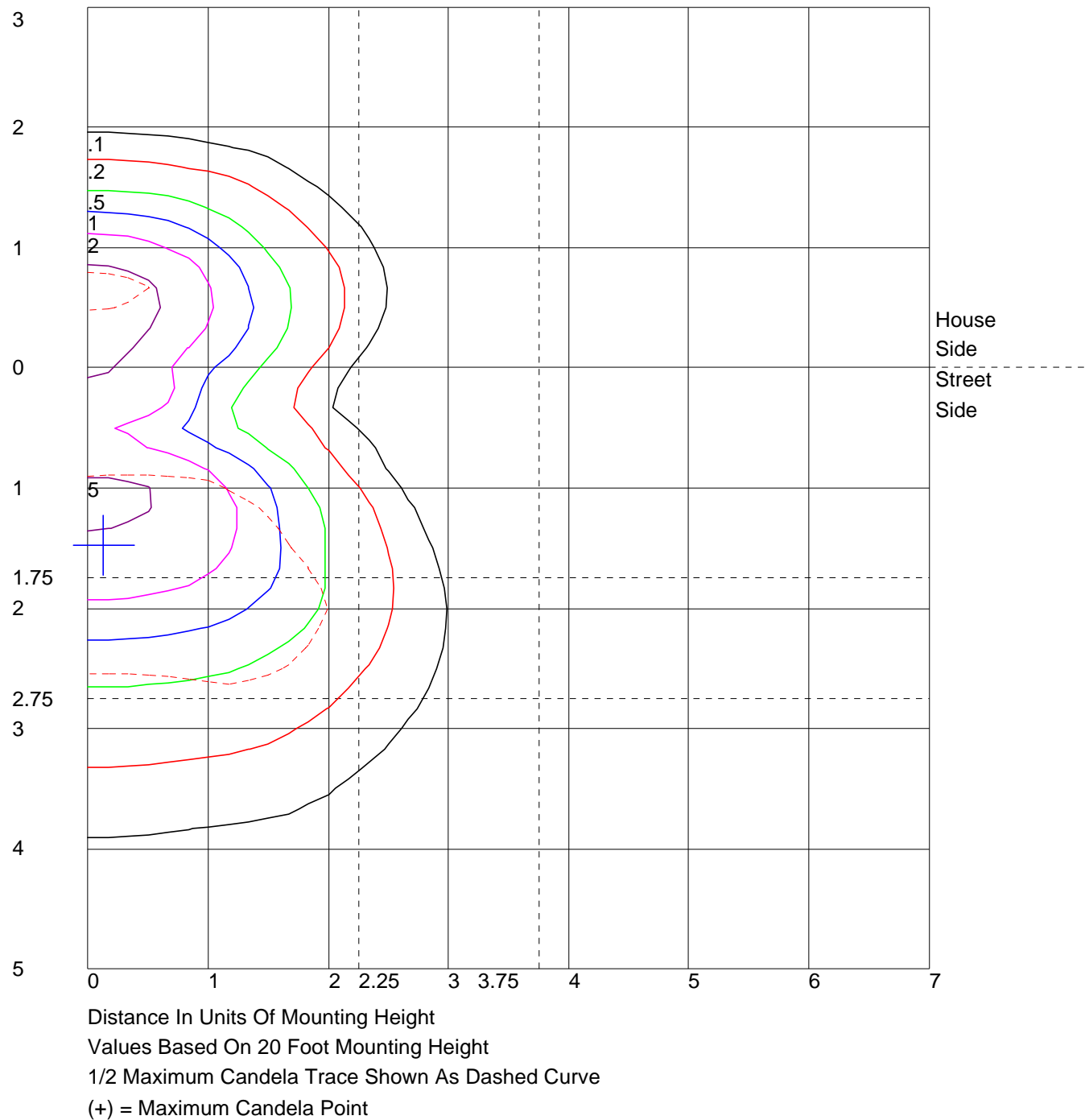
	Lumens	Percent Of Luminaire
Downward Street Side	8336.3	61.8
Downward House Side	5155.1	38.2
Downward Total	13491.4	100.0
Upward Street Side	0.0	0.0
Upward House Side	0.0	0.0
Upward Total	0.0	0.0
Total Flux	13491.4	100.0

POLAR GRAPH

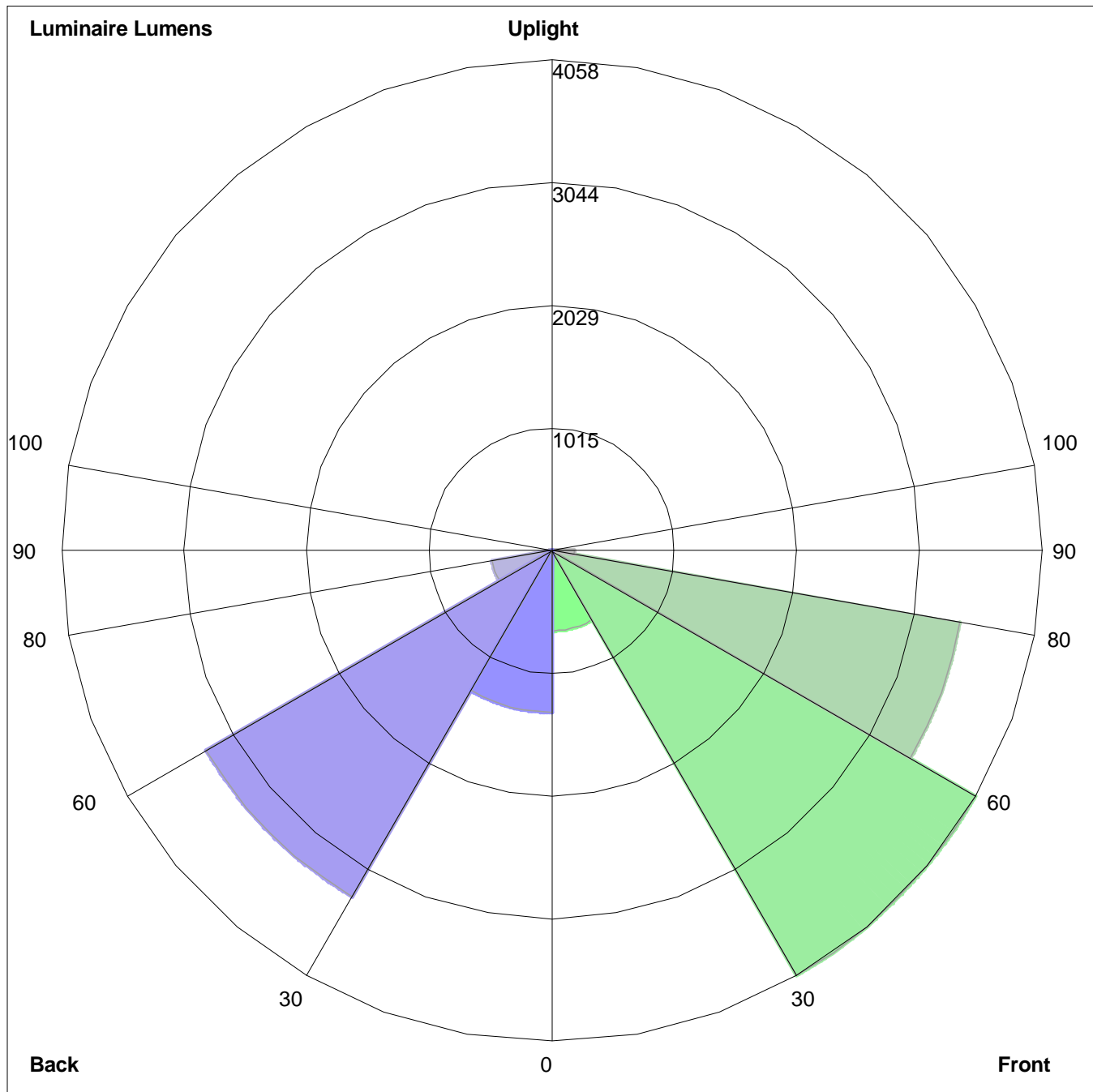


Maximum Candela = 9760 Located At Horizontal Angle = 5, Vertical Angle = 56
1 - Vertical Plane Through Horizontal Angles (5 - 185) (Through Max. Cd.)
2 - Horizontal Cone Through Vertical Angle (56) (Through Max. Cd.)

ISOFOOTCANDLE LINES OF HORIZONTAL ILLUMINANCE



LUMINAIRE CLASSIFICATION SYSTEM (LCS) GRAPH



Luminaire Lumens:
Front: Low=662.8, Medium=4058.1, High=3431.3, Very High=184.2
Back: Low=1336.5, Medium=3302.8, High=499.7, Very High=16.0
Uplight: Low=0.0, High=0.0

BUG Rating : B3-U0-G2