



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

Report No: L062014305



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Issue Date: 7/24/2020

Report Prepared For: Leadsun Inc
1920 South Archibald Ave Unit I Ontario CA 91761

Model Number: RS20-T2/20W/5000K

Test: Photometric/Colorimetric/Electrical Test

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.

Special Test Condition: Fixture is tested with 0.92A constant current source.

Sample Arrival Date: 7/6/20

Date of Tests: 7/20/20 - 7/24/20

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-S4	1/9/21
BK PRECISION	1747	PS-DC04	1/10/21
Fluke Digital Thermometer	52K/J	MT-TP05	1/10/21
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

General Information

Manufacturer:	Leadsun Inc
Model Number:	RS20-T2/20W/5000K
Driver Model Number:	N/A

Test Summary

Total Lumens:	3465.00
Efficacy:	172.47
Color Redering Index:	72.6
Correlated Color Temperature:	4972
Input Voltage (VDC):	21.79
Input Current (Amp):	0.9222
Input Power (W):	20.09
Input Power Factor:	1.0000
Current ATHD (%):	N/A

Test Condition

Ambient Temperature (°C):	25.0
Stabilization Time (Hours):	0:30
Total Operating Time (Hours):	1:00

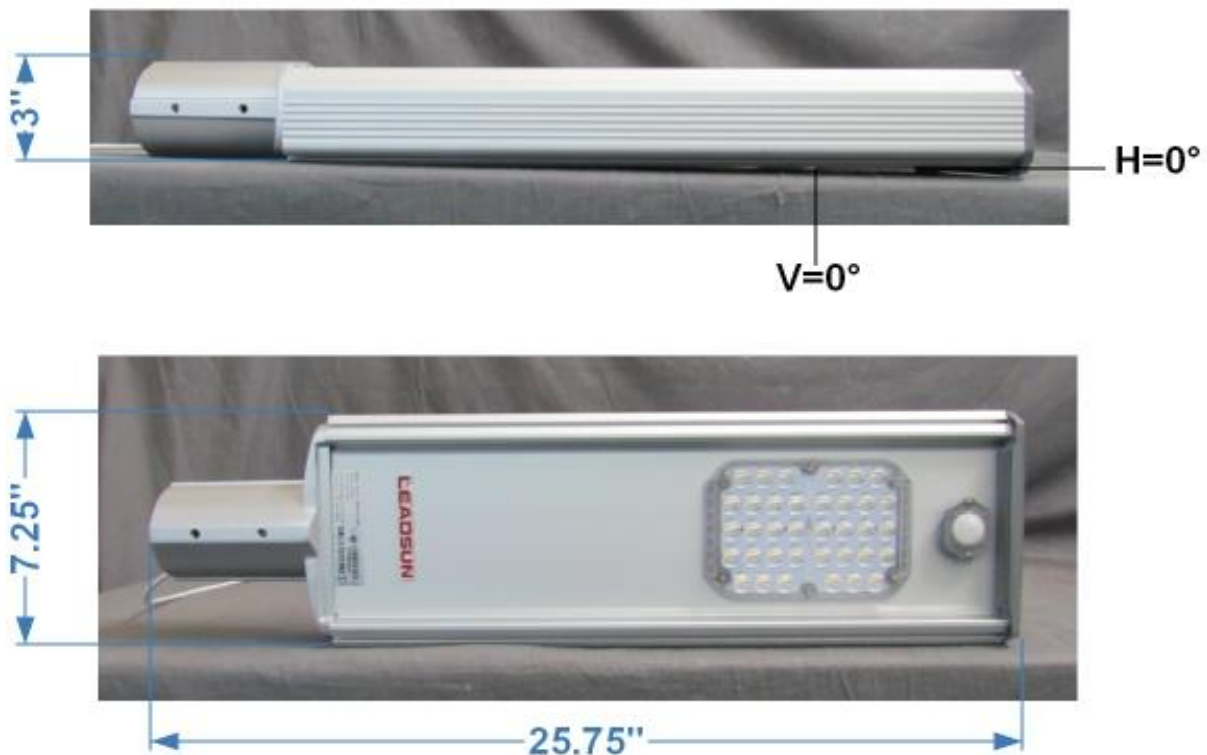
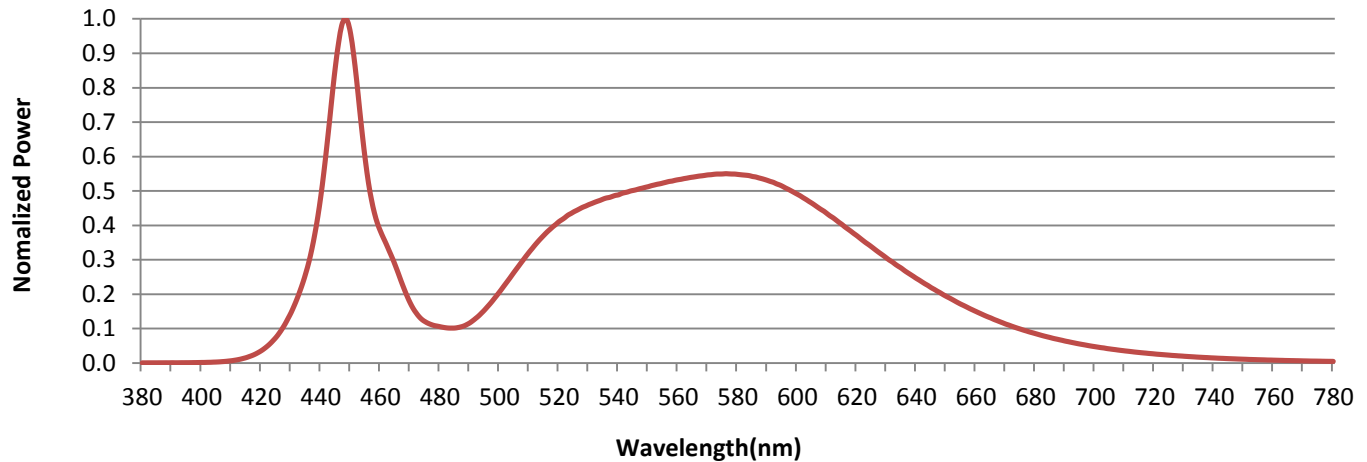


FIG. 1 LUMINAIRE

Colorimetry Test Results

Spectral Power Distribution



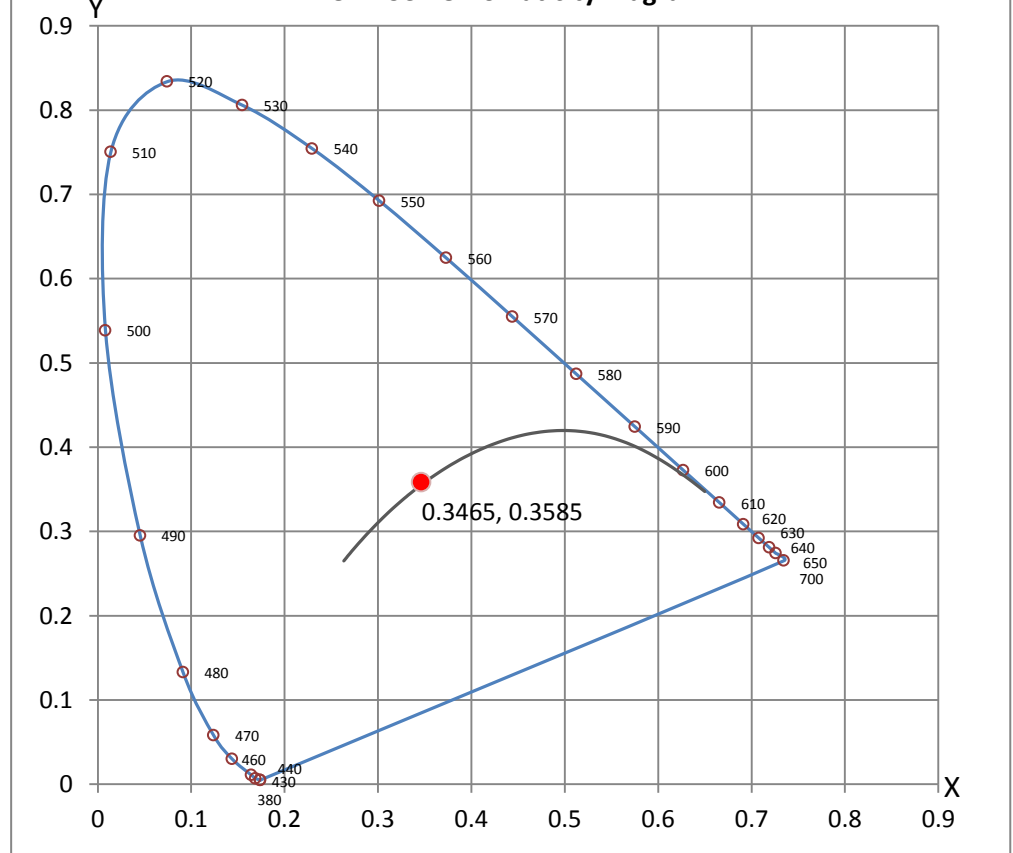
CRI & CCT

x	0.3465
y	0.3585
u'	0.2097
v'	0.4882
CRI	72.60
CCT	4972
Duv	0.00288

R Values

R1	69.45
R2	77.76
R3	83.72
R4	72.68
R5	69.82
R6	68.97
R7	82.44
R8	56.08
R9	-31.31
R10	47.05
R11	69.20
R12	39.82
R13	70.79
R14	90.49
R15	63.61

CIE 1931 Chromaticity Diagram





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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 : Keyur Patel

Test Report Reviewed by:

Steve Kang
Quality Assurance

**Attached are photometric data reports. Total number of pages: 13*



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Photometric Test Report

IES ROAD REPORT

PHOTOMETRIC FILENAME : L062014305.IES

DESCRIPTIVE INFORMATION (From Photometric File)

IESNA:LM-63-2002
[TEST] L062014305
[TESTLAB] LIGHT LABORATORY, INC. (www.lightlaboratory.com)
[ISSUEDATE] 7/24/2020
[MANUFAC] Leadsun Inc
[LUMCAT] RS20-T2/20W/5000K
[LUMINAIRE] 20W 5000K luminaire with 36 chips and T2 lens
[BALLASTCAT] N/A
[OTHER] INDICATING THE CANDELA VALUES ARE ABSOLUTE AND
[MORE] SHOULD NOT BE FACTORED FOR DIFFERENT LAMP RATINGS.
[POWER SUPPLY] 0.92A CONSTANT CURRENT SOURCE
[INPUT] 21.79VDC, 20.09W
[TEST PROCEDURE] IESNA:LM-79-08

CHARACTERISTICS

IES Classification	Type II
Longitudinal Classification	Short
Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Luminaire Lumens	3465
Downward Total Efficiency	N.A. (absolute)
Total Luminaire Efficiency	N.A. (absolute)
Luminaire Efficacy Rating (LER)	172
Total Luminaire Watts	20.09
Ballast Factor	1.00
Upward Waste Light Ratio	0.00
Maximum Candela	2191
Maximum Candela Angle	75H 55V
Maximum Candela (<90 Degrees Vertical)	2191
Maximum Candela Angle (<90 Degrees Vertical)	75H 55V
Maximum Candela At 90 Degrees Vertical	0 (0.0% Luminaire Lumens)
Maximum Candela from 80 to <90 Degrees Vertical	144 (4.2% Luminaire Lumens)
Cutoff Classification (deprecated)	N.A. (absolute)

IES ROAD REPORT
PHOTOMETRIC FILENAME : L062014305.IES

LUMINAIRE CLASSIFICATION SYSTEM (LCS)

	Lumens	% Lamp	% Luminaire
FL - Front-Low (0-30)	502.0	N.A.	14.5
FM - Front-Medium (30-60)	1301.3	N.A.	37.6
FH - Front-High (60-80)	377.1	N.A.	10.9
FVH - Front-Very High (80-90)	10.5	N.A.	0.3
BL - Back-Low (0-30)	332.6	N.A.	9.6
BM - Back-Medium (30-60)	668.0	N.A.	19.3
BH - Back-High (60-80)	263.3	N.A.	7.6
BVH - Back-Very High (80-90)	10.2	N.A.	0.3
UL - Uplight-Low (90-100)	0.0	N.A.	0.0
UH - Uplight-High (100-180)	0.0	N.A.	0.0
Total	3465.0	N.A.	100.0
BUG Rating	B1-U0-G1		

ZONAL LUMEN SUMMARY

Zone	%
0-20	10.9
0-30	24.1
0-40	41.7
0-60	80.9
0-80	99.4
0-90	100
10-90	97.2
20-40	30.8
20-50	50.8
40-70	53.4
60-80	18.5
70-80	4.4
80-90	0.6
90-110	0
90-120	0
90-130	0
90-150	0
90-180	0
110-180	0
0-180	100

IES ROAD REPORT
PHOTOMETRIC FILENAME : L062014305.IES

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	1019	1019	1019	1019	1019	1019	1019	1019	1019	1019
5.0	1097	1099	1100	1096	1092	1090	1086	1082	1075	1069
10.0	1149	1150	1151	1146	1138	1135	1131	1124	1111	1103
15.0	1188	1189	1189	1184	1176	1172	1170	1163	1152	1145
20.0	1255	1256	1254	1246	1235	1224	1217	1209	1199	1196
25.0	1328	1328	1328	1326	1322	1315	1309	1300	1290	1277
30.0	1257	1261	1271	1289	1308	1326	1353	1377	1394	1400
35.0	1060	1065	1082	1108	1141	1188	1249	1322	1394	1463
37.5	974	979	993	1018	1052	1104	1168	1249	1343	1445
40.0	851	860	880	915	961	1021	1087	1170	1276	1398
42.5	681	688	710	751	819	905	1000	1096	1203	1320
45.0	515	520	534	568	631	726	851	1001	1153	1274
47.5	409	411	416	429	460	522	635	809	1054	1237
50.0	333	334	340	349	368	394	450	596	841	1134
52.5	271	272	277	284	295	311	341	407	617	958
55.0	181	185	199	218	234	246	265	303	388	671
57.5	98	102	114	136	169	191	209	237	281	414
60.0	75	76	77	81	102	134	158	185	215	270
62.5	69	69	71	71	71	89	115	134	155	191
65.0	62	62	64	65	65	68	80	95	113	146
67.5	55	56	57	58	59	61	66	74	86	108
70.0	48	49	50	52	54	56	60	64	70	84
72.5	48	45	44	45	47	49	52	57	61	69
75.0	52	43	38	38	40	42	45	49	52	54
77.5	39	33	30	31	32	35	37	39	42	44
80.0	25	22	22	22	24	25	28	29	31	34
85.0	4	4	4	4	5	5	6	7	7	8
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	1019	1019	1019	1019	1019	1019	1019	1019	1019	1019
5.0	1064	1060	1053	1049	1041	1034	1029	1021	1017	1007
10.0	1096	1088	1079	1070	1060	1051	1040	1029	1018	1003
15.0	1137	1124	1116	1100	1088	1076	1064	1047	1027	1007
20.0	1186	1173	1163	1144	1129	1112	1095	1071	1042	1015
25.0	1257	1239	1229	1204	1186	1167	1145	1110	1074	1035
30.0	1386	1357	1330	1293	1268	1247	1217	1177	1127	1077
35.0	1507	1527	1505	1441	1390	1352	1305	1250	1190	1123
37.5	1535	1593	1605	1555	1468	1411	1356	1300	1233	1157
40.0	1522	1637	1694	1680	1578	1489	1416	1351	1278	1189
42.5	1471	1648	1770	1797	1742	1593	1494	1416	1326	1233
45.0	1403	1585	1797	1907	1889	1731	1581	1483	1388	1275
47.5	1377	1541	1777	1981	2023	1900	1673	1543	1440	1316
50.0	1355	1511	1717	1985	2124	2049	1782	1595	1457	1331
52.5	1311	1500	1644	1896	2144	2135	1919	1645	1486	1342
55.0	1104	1465	1604	1768	2077	2191	2023	1668	1482	1339
57.5	824	1325	1584	1679	1947	2190	2074	1727	1474	1331
60.0	566	1074	1499	1627	1816	2138	2108	1820	1482	1331
62.5	360	792	1319	1565	1646	1943	2048	1772	1425	1280
65.0	230	573	1020	1380	1421	1581	1815	1652	1333	1216
67.5	155	346	675	1042	1170	1239	1433	1372	1190	1066

IES ROAD REPORT
PHOTOMETRIC FILENAME : L062014305.IES

CANDELA TABULATION - (Cont.)

70.0	113	190	365	637	853	901	1014	1015	916	841
72.5	87	122	186	315	477	561	622	671	600	561
75.0	62	78	102	134	201	299	356	341	306	298
77.5	44	54	68	85	112	176	220	184	182	176
80.0	33	39	52	70	98	137	144	113	108	99
85.0	9	11	15	21	22	19	19	20	19	18
90.0	0	0	0	0	0	0	0	0	0	0

Vert. Horizontal Angles
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	1019	1019	1019	1019	1019	1019	1019	1019	1019	1019
5.0	1000	995	989	982	973	968	962	953	946	941
10.0	991	979	967	951	936	922	910	894	883	872
15.0	987	966	944	920	898	873	852	824	805	786
20.0	987	959	924	887	850	814	780	750	721	697
25.0	997	956	907	856	798	749	705	669	635	609
30.0	1022	956	889	820	752	687	634	591	557	534
35.0	1054	972	883	786	691	617	561	522	494	474
37.5	1080	982	883	769	671	589	531	492	466	446
40.0	1098	995	883	764	654	560	500	464	440	420
42.5	1129	1014	888	747	626	529	471	441	416	395
45.0	1162	1034	882	736	604	507	445	416	388	366
47.5	1196	1055	887	724	582	481	422	389	360	343
50.0	1215	1068	890	712	558	451	400	363	337	321
52.5	1209	1055	882	700	539	432	369	335	312	300
55.0	1200	1035	836	647	495	395	346	312	292	285
57.5	1196	1024	815	614	452	354	314	290	274	267
60.0	1177	976	775	577	411	319	283	267	255	242
62.5	1150	980	759	555	386	290	254	241	233	210
65.0	1113	953	754	540	369	271	232	212	198	165
67.5	985	824	646	485	345	256	216	190	159	115
70.0	772	648	505	384	280	209	181	163	130	87
72.5	499	419	344	253	178	144	126	122	98	66
75.0	279	256	188	113	102	103	78	68	62	51
77.5	164	153	91	52	52	51	45	44	42	40
80.0	82	69	44	37	36	35	32	31	30	30
85.0	17	16	16	15	15	14	13	13	12	12
90.0	0	0	0	0	0	0	0	0	0	0

Vert. Horizontal Angles
Angles

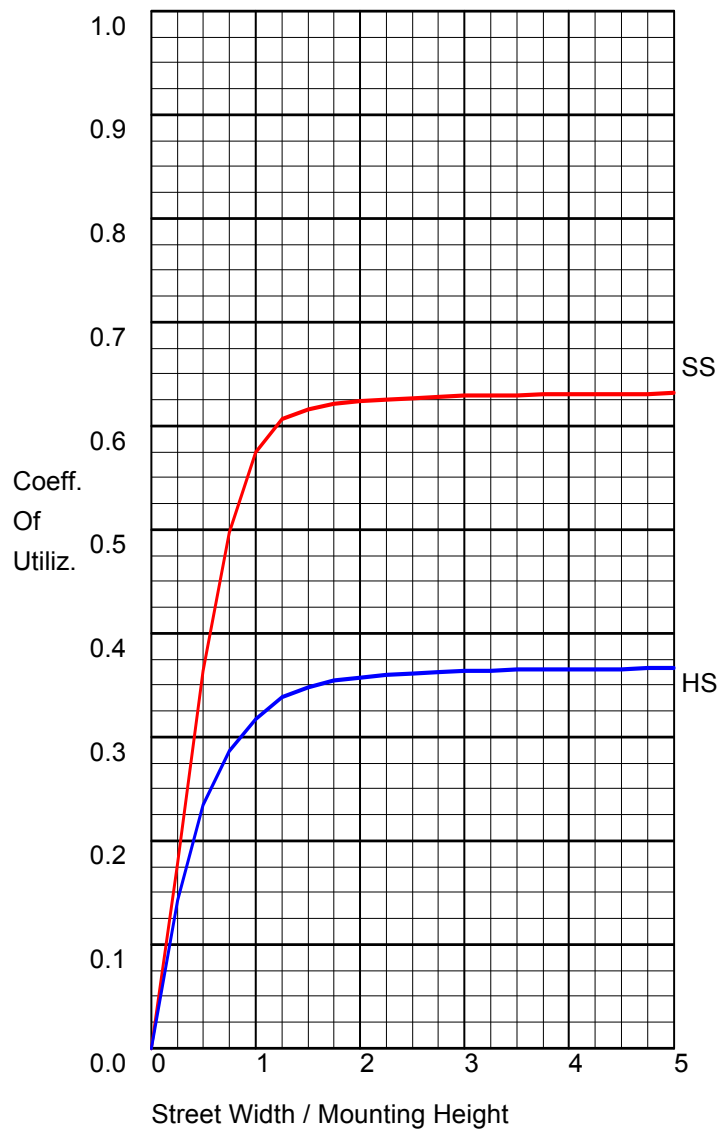
	<u>150</u>	<u>155</u>	<u>160</u>	<u>165</u>	<u>170</u>	<u>175</u>	<u>180</u>
0.0	1019	1019	1019	1019	1019	1019	1019
5.0	938	936	932	927	924	922	920
10.0	865	857	847	840	835	831	830
15.0	773	759	745	737	730	725	724
20.0	678	658	644	634	629	624	622
25.0	588	572	562	556	552	549	546
30.0	517	505	496	489	482	480	479
35.0	458	445	437	431	425	424	423
37.5	429	418	411	407	403	401	401
40.0	404	393	386	383	380	379	379
42.5	377	367	362	360	359	359	358
45.0	352	346	342	341	339	339	338
47.5	333	326	322	321	321	321	321

IES ROAD REPORT
PHOTOMETRIC FILENAME : L062014305.IES

CANDELA TABULATION - (Cont.)

50.0	312	308	307	308	309	309	309
52.5	295	295	295	288	274	261	257
55.0	281	277	257	225	204	195	192
57.5	256	226	188	165	144	131	128
60.0	212	170	131	107	102	101	101
62.5	159	112	90	88	86	84	84
65.0	108	79	78	78	74	72	71
67.5	76	69	70	70	68	68	68
70.0	61	62	63	63	63	64	64
72.5	56	54	56	57	59	61	60
75.0	50	48	48	49	53	58	55
77.5	42	42	41	41	45	46	45
80.0	32	35	35	34	37	36	35
85.0	13	14	15	17	16	16	16
90.0	0	0	0	0	0	0	0

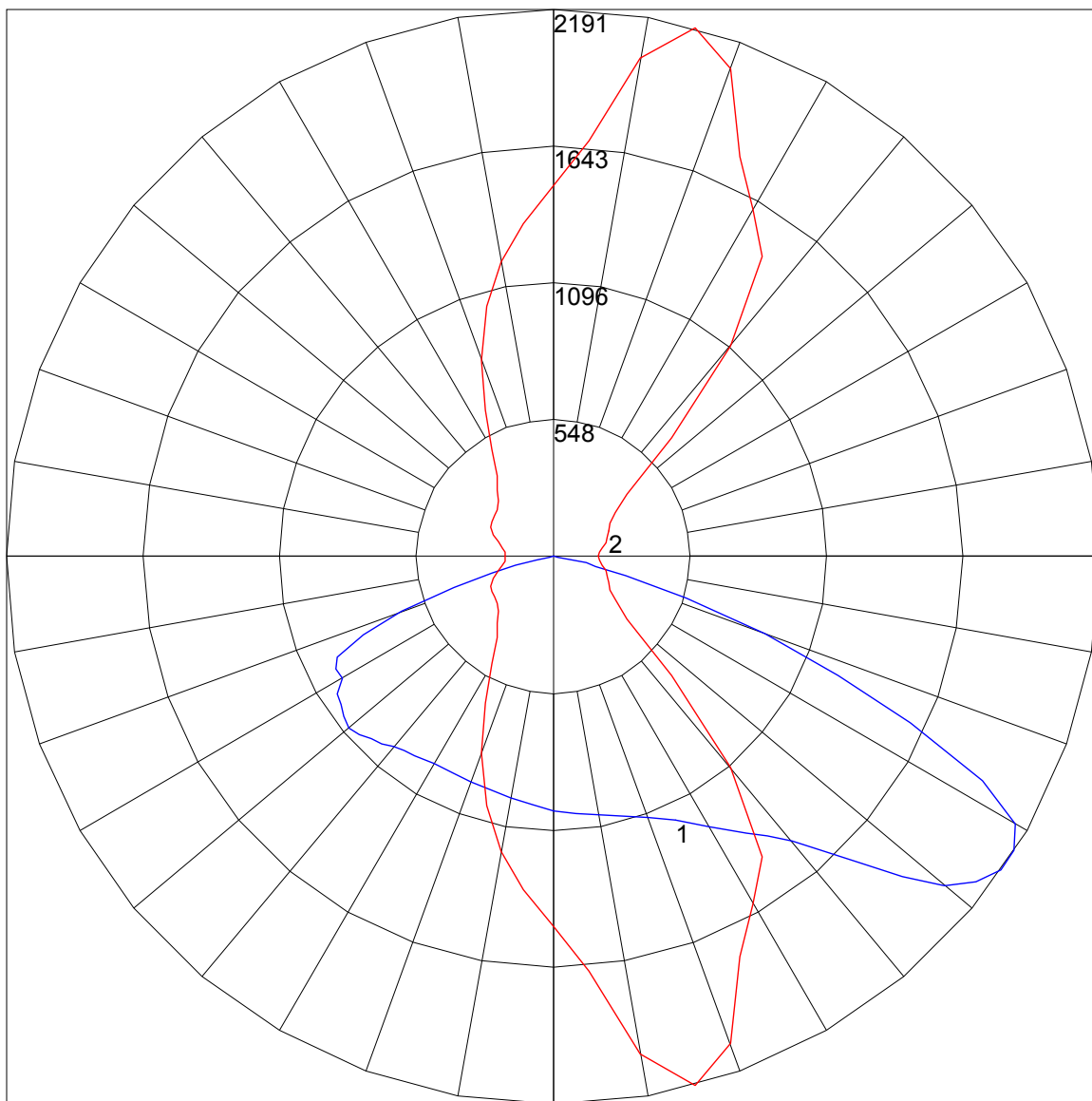
COEFFICIENTS OF UTILIZATION



FLUX DISTRIBUTION

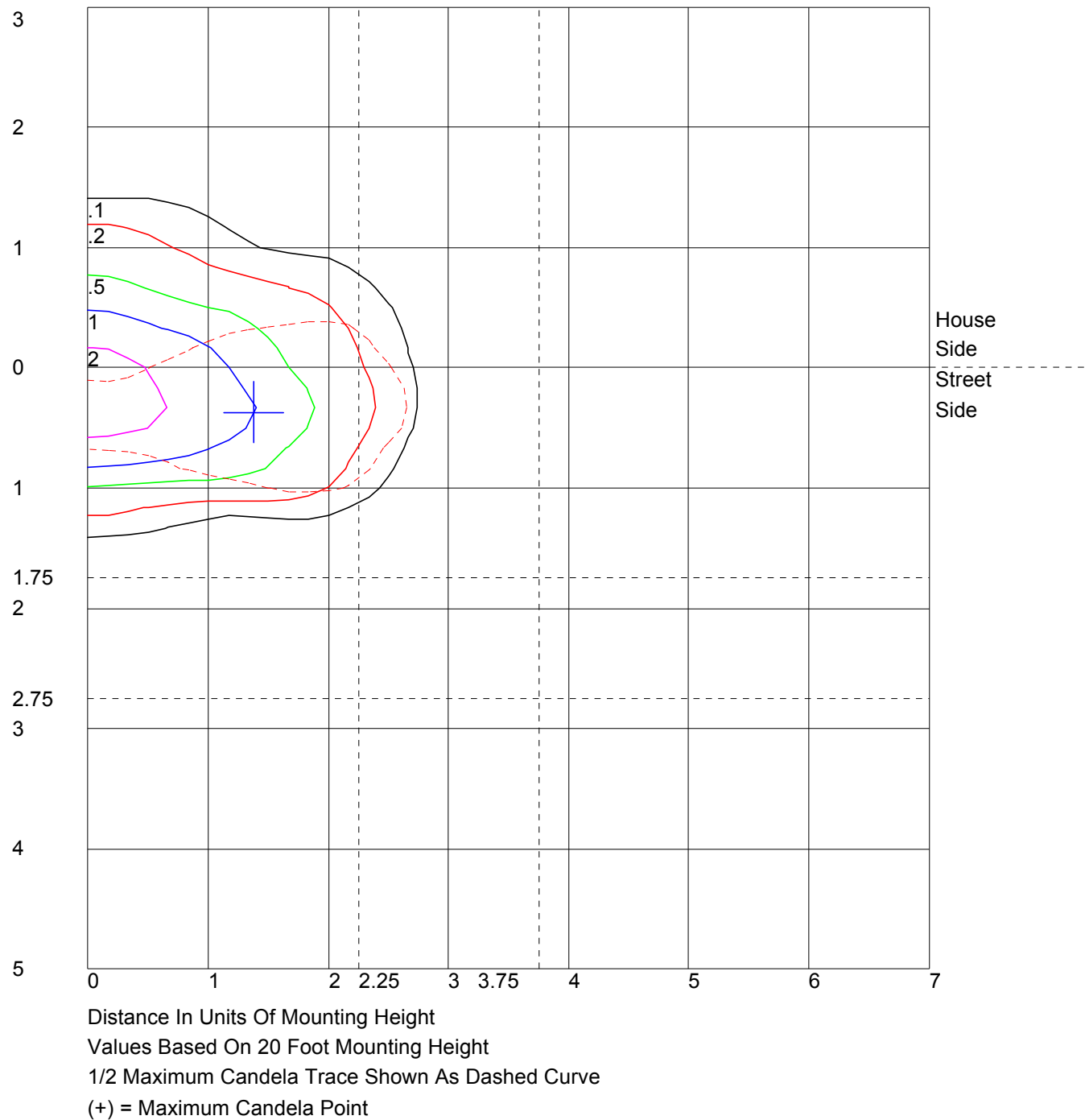
	Lumens	Percent Of Luminaire
Downward Street Side	2190.9	63.2
Downward House Side	1274.1	36.8
Downward Total	3465.0	100.0
Upward Street Side	0.0	0.0
Upward House Side	0.0	0.0
Upward Total	0.0	0.0
Total Flux	3465.0	100.0

POLAR GRAPH

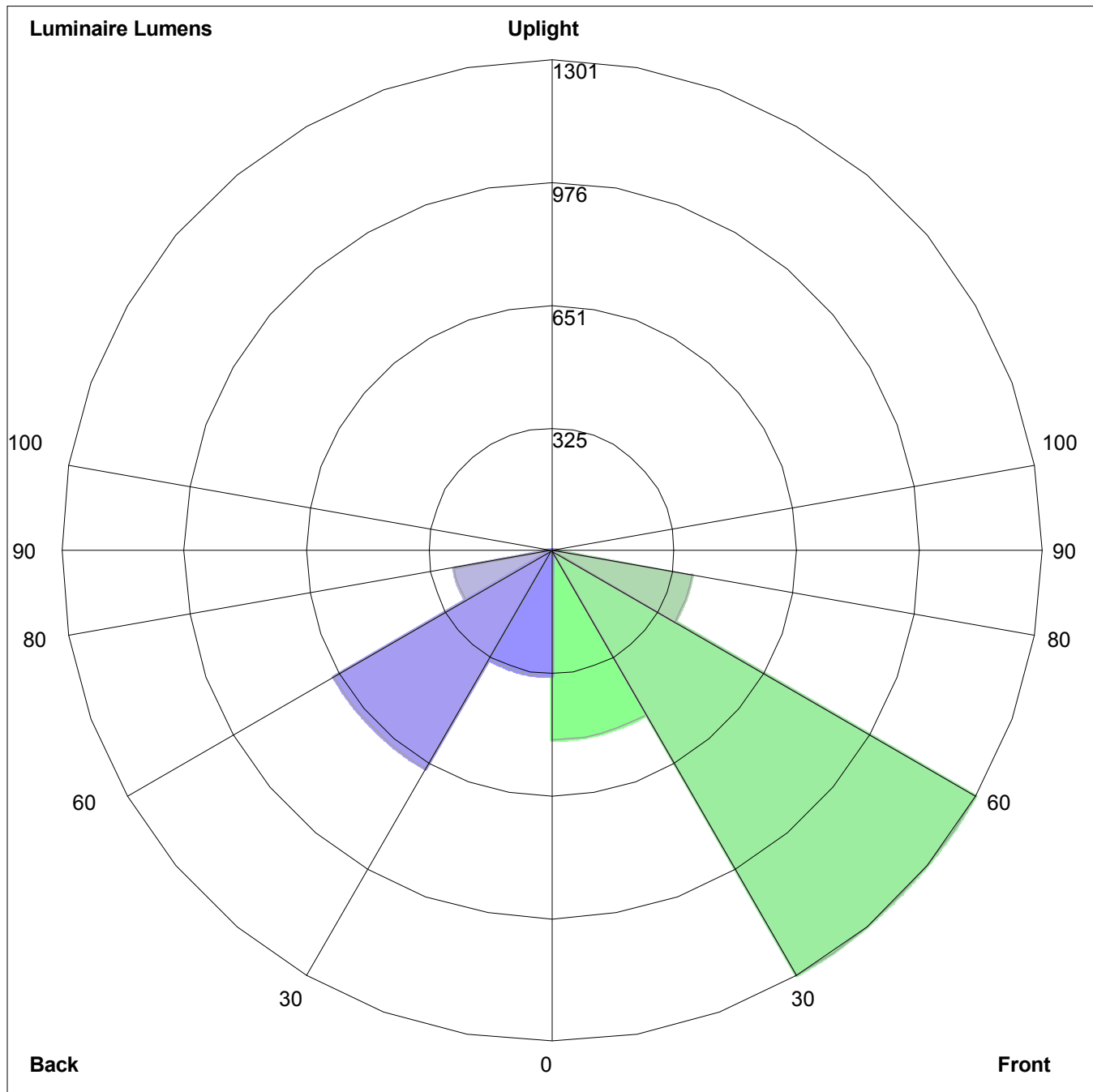


Maximum Candela = 2191 Located At Horizontal Angle = 75, Vertical Angle = 55
1 - Vertical Plane Through Horizontal Angles (75 - 255) (Through Max. Cd.)
2 - Horizontal Cone Through Vertical Angle (55) (Through Max. Cd.)

ISOFOOTCANDLE LINES OF HORIZONTAL ILLUMINANCE



LUMINAIRE CLASSIFICATION SYSTEM (LCS) GRAPH



Luminaire Lumens:
Front: Low=502.0, Medium=1301.3, High=377.1, Very High=10.5
Back: Low=332.6, Medium=668.0, High=263.3, Very High=10.2
Uplight: Low=0.0, High=0.0

BUG Rating : B1-U0-G1