



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

Report No: L062014311



Report No: L062014311

Issue Date: 7/24/2020

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

Model Number: RS20-T3/20W/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 no special conditions.

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-T3/20W/5000K
Driver Model Number:	N/A

Test Summary

Total Lumens:	3399.60
Efficacy:	169.71
Color Redering Index:	72.6
Correlated Color Temperature:	4961
Input Voltage (VDC):	21.79
Input Current (Amp):	0.9195
Input Power (W):	20.03
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

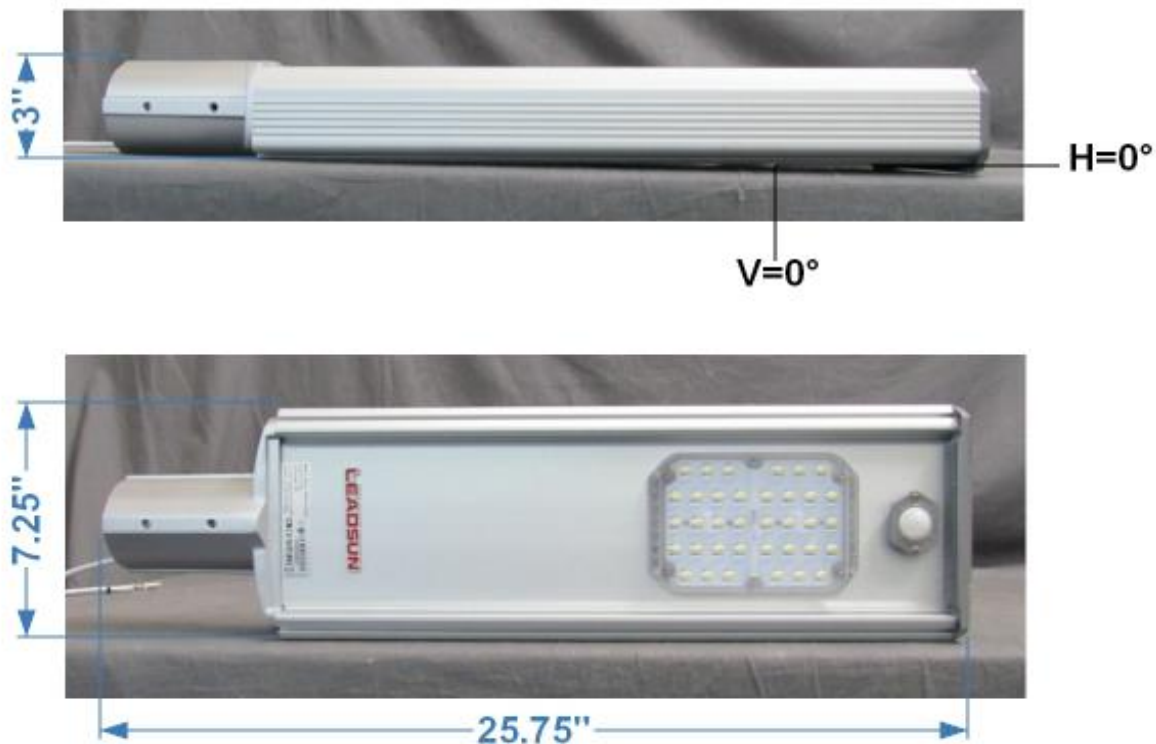
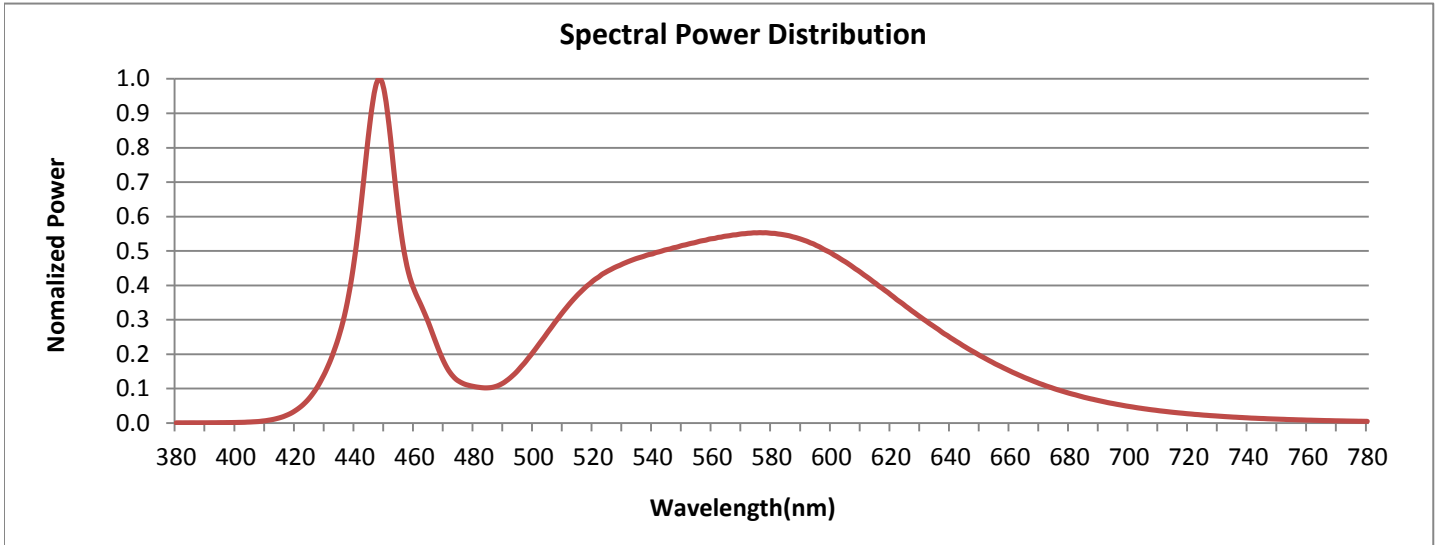


FIG. 1 LUMINAIRE

Colorimetry Test Results

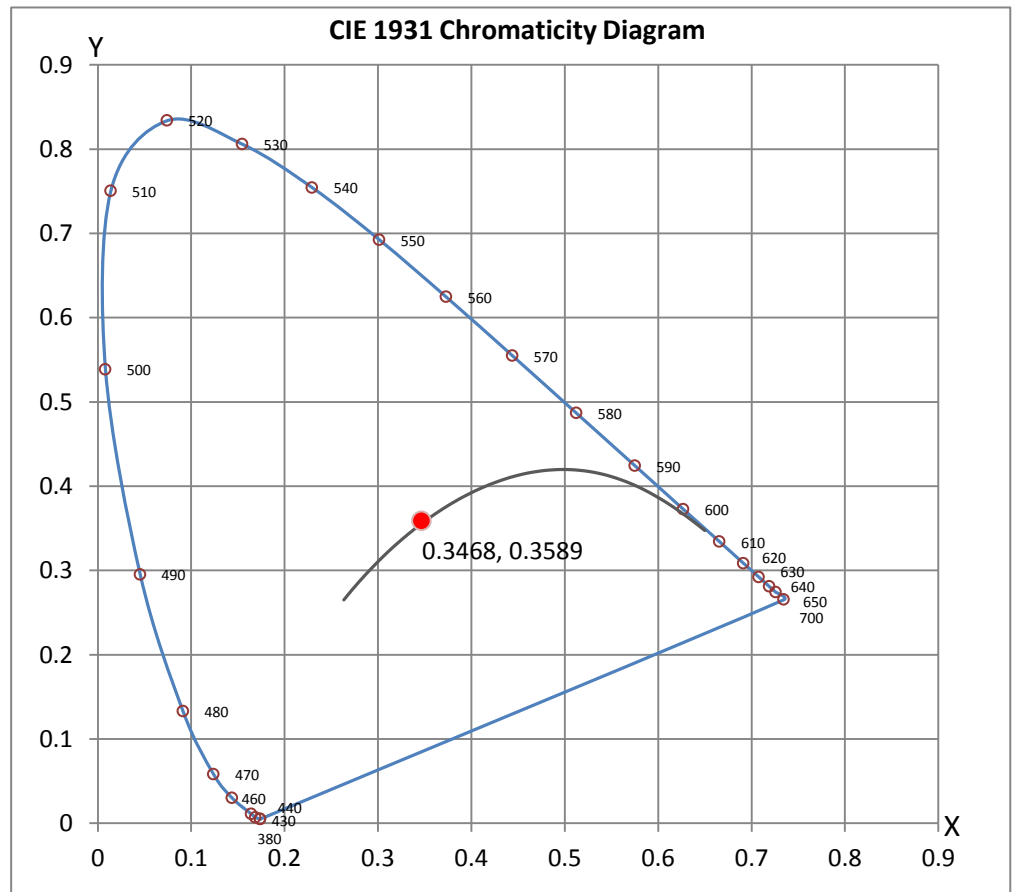


CRI & CCT

x	0.3468
y	0.3589
u'	0.2098
v'	0.4884
CRI	72.60
CCT	4961
Duv	0.00296

R Values

R1	69.45
R2	77.78
R3	83.78
R4	72.67
R5	69.80
R6	69.00
R7	82.48
R8	56.09
R9	-31.17
R10	47.12
R11	69.17
R12	39.82
R13	70.80
R14	90.53
R15	63.60





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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 : L062014311.IES

DESCRIPTIVE INFORMATION (From Photometric File)

IESNA:LM-63-2002
[TEST] L062014311
[TESTLAB] LIGHT LABORATORY, INC. (www.lightlaboratory.com)
[ISSUEDATE] 7/24/2020
[MANUFAC] Leadsun Inc
[LUMCAT] RS20-T3/20W/5000K
[LUMINAIRE] 20W 5000K luminaire with 36 chips and T3 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, 20.03W
[TEST PROCEDURE] IESNA:LM-79-08

CHARACTERISTICS

IES Classification	Type II
Longitudinal Classification	Very Short
Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Luminaire Lumens	3400
Downward Total Efficiency	N.A. (absolute)
Total Luminaire Efficiency	N.A. (absolute)
Luminaire Efficacy Rating (LER)	170
Total Luminaire Watts	20.03
Ballast Factor	1.00
Upward Waste Light Ratio	0.00
Maximum Candela	1591
Maximum Candela Angle	70H 45V
Maximum Candela (<90 Degrees Vertical)	1591
Maximum Candela Angle (<90 Degrees Vertical)	70H 45V
Maximum Candela At 90 Degrees Vertical	0 (0.0% Luminaire Lumens)
Maximum Candela from 80 to <90 Degrees Vertical	76 (2.2% Luminaire Lumens)
Cutoff Classification (deprecated)	N.A. (absolute)

IES ROAD REPORT
PHOTOMETRIC FILENAME : L062014311.IES

LUMINAIRE CLASSIFICATION SYSTEM (LCS)

	Lumens	% Lamp	% Luminaire
FL - Front-Low (0-30)	481.5	N.A.	14.2
FM - Front-Medium (30-60)	1253.2	N.A.	36.9
FH - Front-High (60-80)	348.2	N.A.	10.2
FVH - Front-Very High (80-90)	10.7	N.A.	0.3
BL - Back-Low (0-30)	353.9	N.A.	10.4
BM - Back-Medium (30-60)	707.8	N.A.	20.8
BH - Back-High (60-80)	233.2	N.A.	6.9
BVH - Back-Very High (80-90)	11.0	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	3399.5	N.A.	100.0
BUG Rating	B1-U0-G1		

ZONAL LUMEN SUMMARY

Zone	%
0-20	10.9
0-30	24.6
0-40	42.8
0-60	82.3
0-80	99.4
0-90	100
10-90	97.2
20-40	31.9
20-50	52.5
40-70	52.3
60-80	17.1
70-80	4.2
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

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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	978	978	978	978	978	978	978	978	978	978
5.0	1055	1056	1058	1055	1051	1051	1050	1046	1040	1035
10.0	1093	1093	1096	1093	1088	1086	1086	1082	1073	1069
15.0	1127	1127	1129	1126	1120	1117	1117	1113	1105	1102
20.0	1199	1200	1202	1200	1195	1186	1179	1168	1155	1146
25.0	1214	1214	1216	1220	1223	1224	1229	1234	1235	1229
30.0	1184	1185	1190	1201	1214	1227	1246	1267	1286	1302
35.0	1082	1084	1093	1109	1129	1160	1201	1253	1295	1333
37.5	1018	1022	1032	1046	1069	1105	1155	1214	1277	1332
40.0	945	949	960	975	999	1037	1093	1159	1234	1316
42.5	875	877	887	906	932	969	1018	1084	1169	1265
45.0	798	800	810	833	866	906	956	1020	1112	1212
47.5	714	717	729	753	789	832	887	956	1047	1147
50.0	621	625	640	668	706	757	819	899	988	1075
52.5	513	520	536	562	605	658	730	828	928	1012
55.0	403	408	420	442	484	540	623	723	823	921
57.5	311	312	317	330	366	417	496	591	706	811
60.0	246	248	250	256	273	304	360	442	563	682
62.5	200	201	204	208	217	236	261	307	395	520
65.0	161	163	167	171	177	188	199	228	292	387
67.5	126	127	131	136	144	149	160	182	221	279
70.0	91	94	101	106	111	116	127	147	178	217
72.5	71	72	76	83	88	93	101	115	139	171
75.0	58	59	62	66	72	77	82	90	104	124
77.5	45	47	49	52	57	61	66	71	76	80
80.0	31	33	35	37	40	44	47	48	50	51
85.0	4	4	5	5	5	6	7	8	10	11
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	978	978	978	978	978	978	978	978	978	978
5.0	1031	1027	1022	1017	1010	1003	997	990	983	974
10.0	1065	1060	1054	1046	1036	1025	1018	1007	992	976
15.0	1096	1088	1083	1073	1063	1053	1042	1027	1006	985
20.0	1135	1124	1121	1110	1102	1093	1082	1060	1032	1006
25.0	1208	1189	1179	1165	1155	1149	1138	1115	1083	1052
30.0	1306	1304	1290	1258	1233	1215	1190	1156	1115	1077
35.0	1371	1399	1408	1390	1345	1296	1248	1189	1128	1070
37.5	1383	1427	1459	1461	1421	1358	1293	1230	1156	1084
40.0	1384	1446	1500	1522	1499	1432	1347	1268	1181	1096
42.5	1370	1453	1530	1565	1563	1504	1397	1292	1192	1097
45.0	1324	1420	1528	1585	1591	1547	1433	1313	1199	1085
47.5	1256	1370	1493	1575	1588	1559	1452	1321	1183	1069
50.0	1169	1274	1423	1538	1565	1560	1479	1317	1177	1052
52.5	1089	1184	1324	1476	1538	1546	1492	1324	1174	1034
55.0	1000	1088	1210	1385	1491	1512	1471	1306	1146	1021
57.5	911	1001	1111	1278	1432	1474	1444	1294	1135	1010
60.0	810	916	1019	1161	1366	1432	1393	1258	1112	988
62.5	664	823	924	1049	1242	1354	1311	1180	1031	926
65.0	522	673	786	886	1043	1205	1182	1058	928	840
67.5	373	503	618	694	820	974	972	875	771	705

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CANDELA TABULATION - (Cont.)

70.0	271	361	439	489	575	688	706	650	570	522
72.5	212	259	298	320	356	411	412	376	325	317
75.0	144	165	180	194	214	229	218	198	189	194
77.5	89	103	115	123	132	129	123	119	122	119
80.0	54	61	68	74	76	75	73	71	73	68
85.0	13	15	17	18	19	20	20	20	19	19
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	978	978	978	978	978	978	978	978	978	978
5.0	965	959	954	946	940	937	930	923	919	915
10.0	964	952	942	927	917	907	898	887	880	872
15.0	967	947	928	909	893	877	862	845	835	825
20.0	980	953	924	895	869	847	827	806	791	779
25.0	1016	975	933	892	853	819	791	766	743	727
30.0	1033	977	926	880	833	789	751	719	691	671
35.0	1016	958	899	844	782	735	694	664	636	619
37.5	1015	951	889	828	766	710	666	633	606	588
40.0	1016	946	884	820	755	687	636	602	577	558
42.5	1014	941	879	809	733	663	614	577	549	523
45.0	1000	922	861	794	720	647	585	545	509	486
47.5	981	907	844	769	693	612	552	505	474	450
50.0	958	884	819	734	651	575	509	466	434	409
52.5	934	858	787	701	607	520	450	413	388	369
55.0	918	837	756	658	550	458	396	365	347	329
57.5	907	824	737	627	506	408	345	319	303	291
60.0	890	790	695	579	460	367	308	278	262	254
62.5	837	730	644	519	406	330	279	249	227	213
65.0	765	661	555	444	356	293	244	216	194	179
67.5	649	558	458	372	304	252	209	184	168	155
70.0	493	440	365	301	249	206	175	157	143	132
72.5	322	292	248	216	186	160	140	127	114	104
75.0	198	177	148	130	117	108	101	96	90	82
77.5	115	106	93	84	77	67	64	63	63	62
80.0	64	60	54	50	47	44	43	43	43	43
85.0	18	18	17	17	16	16	16	15	15	15
90.0	0	0	0	0	0	0	0	0	0	0

Vert. Angles **Horizontal Angles**

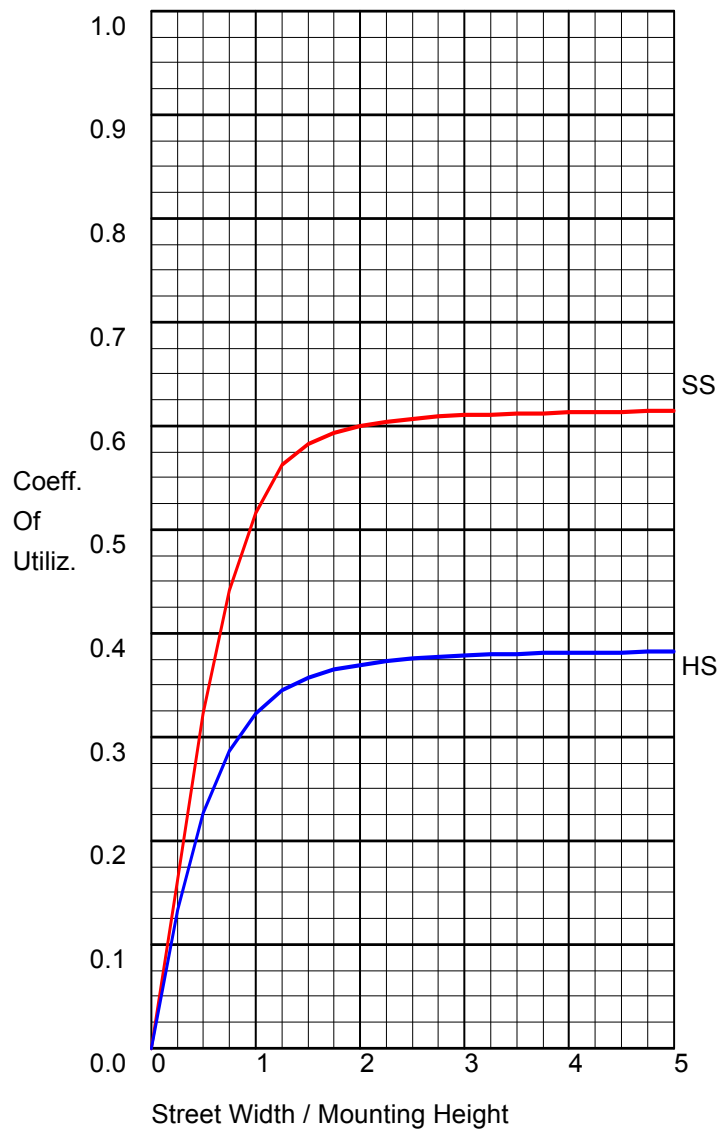
	<u>150</u>	<u>155</u>	<u>160</u>	<u>165</u>	<u>170</u>	<u>175</u>	<u>180</u>
0.0	978	978	978	978	978	978	978
5.0	913	912	909	906	902	901	900
10.0	868	864	858	852	849	846	844
15.0	818	811	803	798	795	794	792
20.0	770	760	751	746	743	741	740
25.0	713	703	693	689	686	684	683
30.0	654	644	637	633	631	630	630
35.0	603	592	585	581	576	575	574
37.5	573	560	552	546	541	538	538
40.0	539	523	514	510	507	506	506
42.5	502	488	481	478	475	472	471
45.0	468	453	444	439	437	435	434
47.5	431	416	408	404	401	399	399

IES ROAD REPORT
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CANDELA TABULATION - (Cont.)

50.0	393	380	372	366	362	359	359
52.5	354	342	333	327	323	320	319
55.0	315	304	296	290	285	284	282
57.5	279	268	259	253	248	246	244
60.0	246	235	226	219	214	211	210
62.5	209	203	196	192	189	186	185
65.0	176	176	172	168	165	162	160
67.5	148	147	147	141	135	129	126
70.0	121	113	112	106	91	79	76
72.5	97	91	84	75	68	65	63
75.0	77	72	65	59	56	54	53
77.5	60	57	52	48	47	46	45
80.0	43	43	40	39	38	37	36
85.0	15	16	16	17	19	19	19
90.0	0	0	0	0	0	0	0

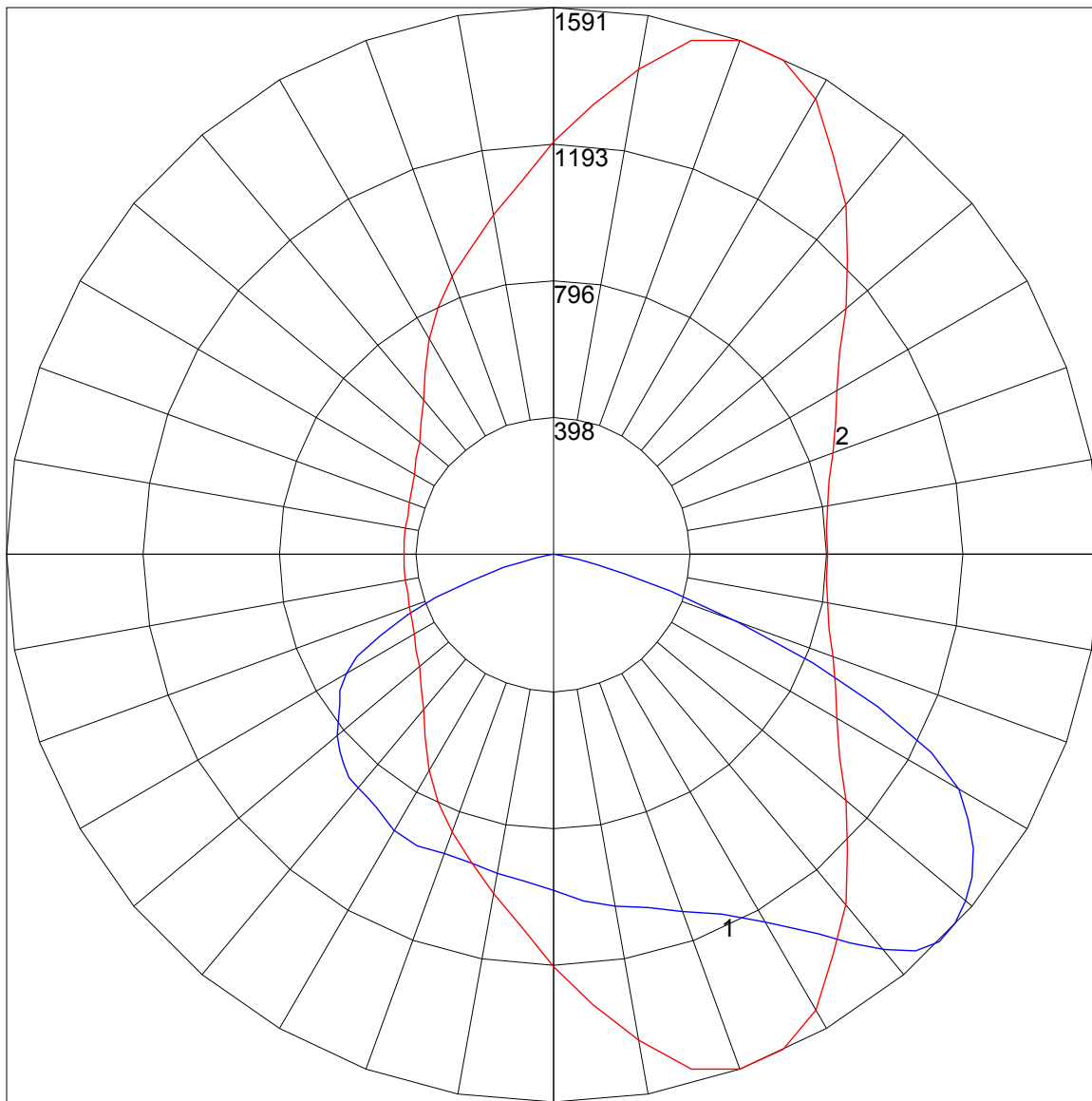
COEFFICIENTS OF UTILIZATION



FLUX DISTRIBUTION

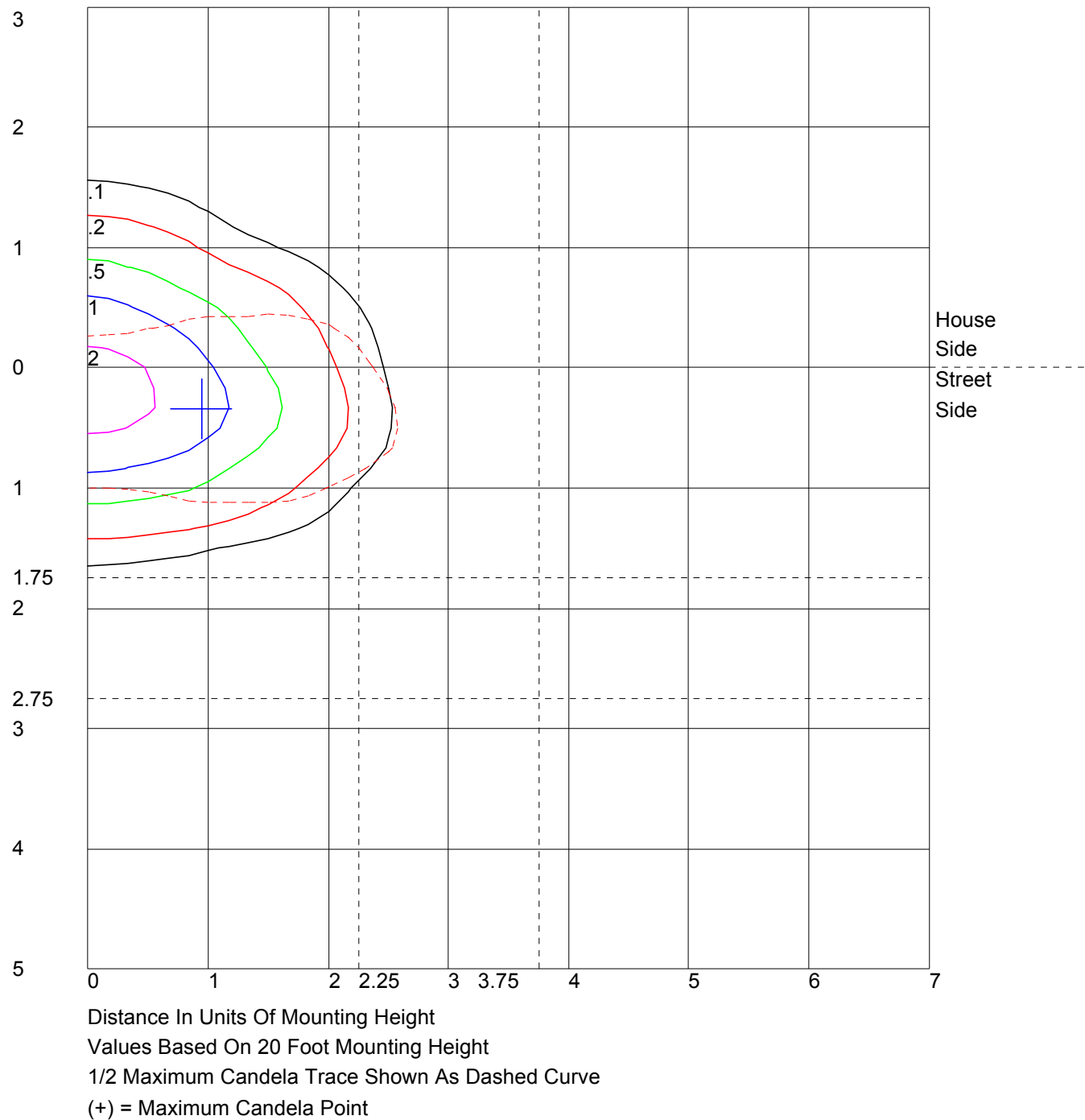
	Lumens	Percent Of Luminaire
Downward Street Side	2093.6	61.6
Downward House Side	1306.0	38.4
Downward Total	3399.6	100.0
Upward Street Side	0.0	0.0
Upward House Side	0.0	0.0
Upward Total	0.0	0.0
Total Flux	3399.6	100.0

POLAR GRAPH

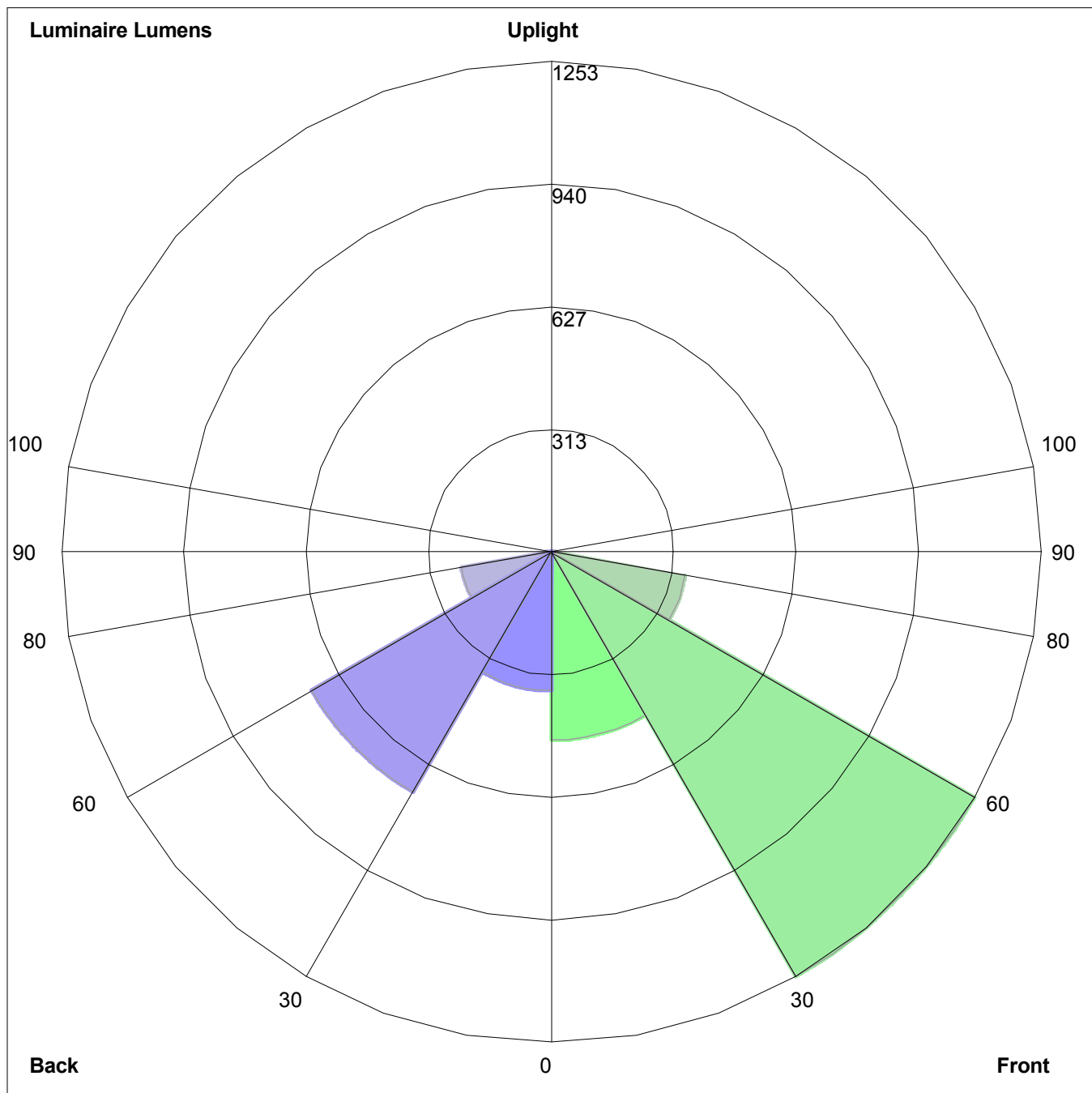


Maximum Candela = 1591 Located At Horizontal Angle = 70, Vertical Angle = 45
1 - Vertical Plane Through Horizontal Angles (70 - 250) (Through Max. Cd.)
2 - Horizontal Cone Through Vertical Angle (45) (Through Max. Cd.)

ISOFOOTCANDLE LINES OF HORIZONTAL ILLUMINANCE



LUMINAIRE CLASSIFICATION SYSTEM (LCS) GRAPH



Luminaire Lumens:
Front: Low=481.5, Medium=1253.2, High=348.2, Very High=10.7
Back: Low=353.9, Medium=707.8, High=233.2, Very High=11.0
Uplight: Low=0.0, High=0.0

BUG Rating : B1-U0-G1