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Report No: L061600401

Date: 6/7/2016



NVLAP LAB CODE 200927-0

**Report No:** L061600401

**Report Prepared For:** Revolution Lighting Technologies (RVLT)  
 4139 Guardian Street, Simi Valley, CA 93063

**Model Number:** 281402-003-M0X

**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. Catalog number is 281402-003-M0X. Received in working and undamaged condition. No modifications were necessary.

**Testing Condition:** Fixture is tested with no special conditions.

**Sample Arrival Date:** 6/2/16

**Date of Tests:** 6/3/16 - 6/7/16

**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	11/18/16
Xitron Power Analyzer	2503AH	MT-EL01	11/30/16
ITECH DC Power Supply	IT6122	PSDC-03-S1	11/17/16
Fluke Digital Thermometer	52k/J	MT-TP02-GC	11/24/16
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**

<b>Manufacturer:</b>	Revolution Lighting Technologies (RVLT)
<b>Model Number:</b>	281402-003-M0X
<b>Driver Model Number:</b>	CUSTOM DRIVER
<b>Total Lumens:</b>	5986.80
<b>Input Voltage (VAC/60Hz):</b>	120.00
<b>Input Current (Amp):</b>	0.43
<b>Input Power (W):</b>	50.41
<b>Input Power Factor:</b>	0.98
<b>Current ATHD @ 120V(%):</b>	19%
<b>Current ATHD @ 277V(%):</b>	N/A
<b>Efficacy:</b>	119
<b>Color Rendering Index (CRI):</b>	75
<b>Correlated Color Temperature (K):</b>	3964
<b>Chromaticity Coordinate x:</b>	0.3836
<b>Chromaticity Coordinate y:</b>	0.3835
<b>Ambient Temperature (°C):</b>	25.0
<b>Stabilization Time (Hours):</b>	0:55
<b>Total Operating Time (Hours):</b>	1:45
<b>Off State Power(W):</b>	0.00

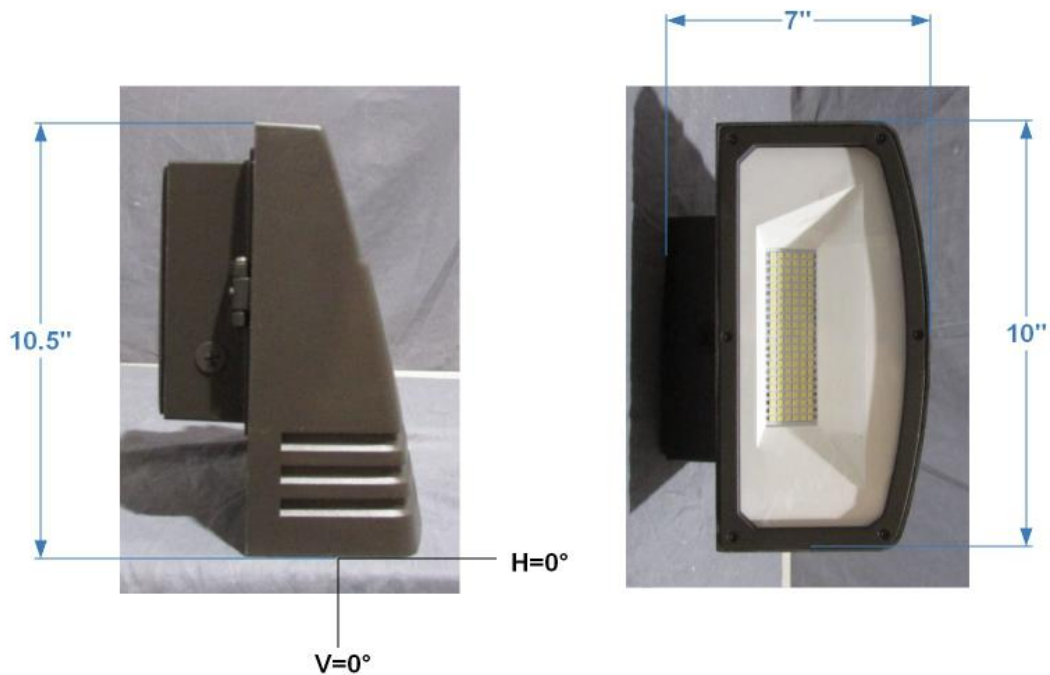
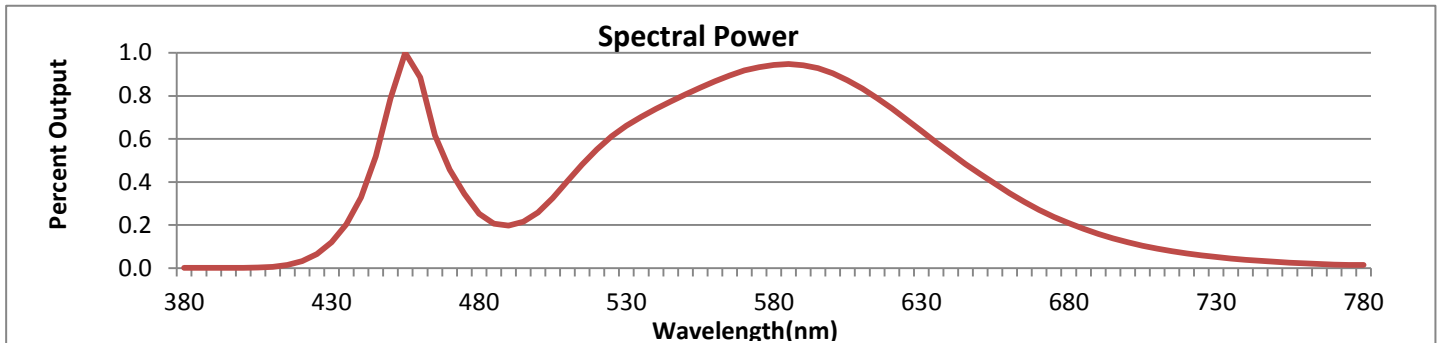


FIG. 1 LUMINAIRE

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



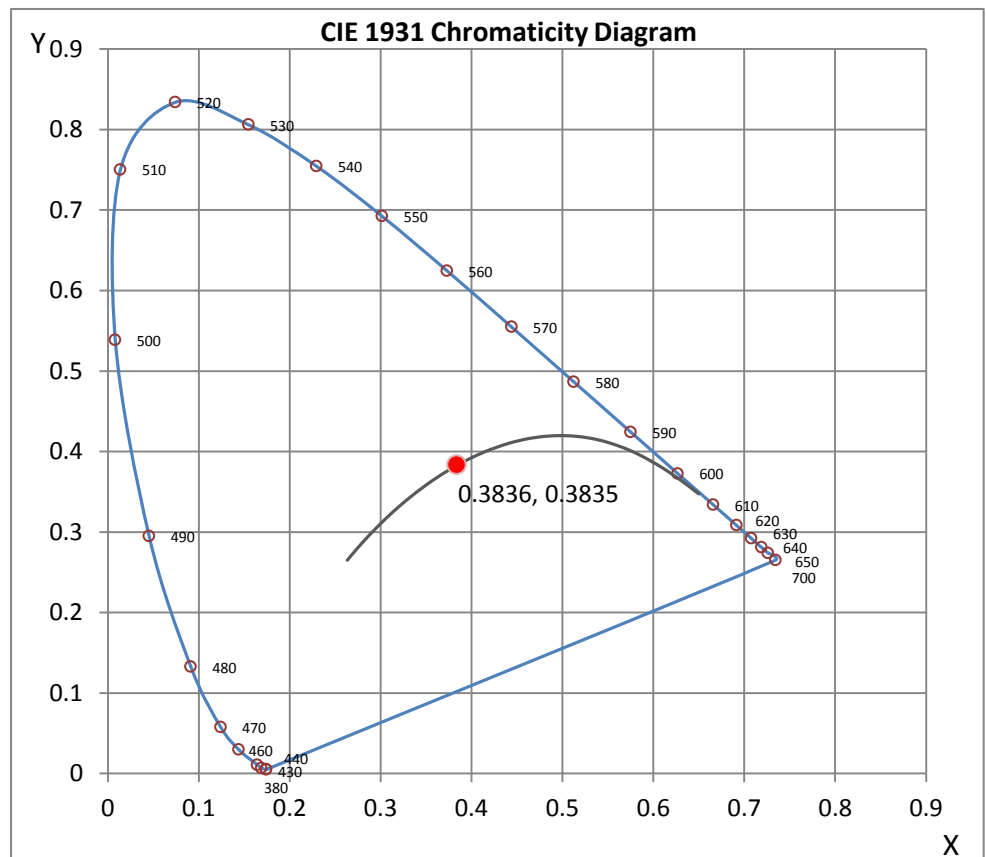
Wavelength	W/m <sup>2</sup> nm	440	0.3284	510	0.4039	580	0.9442	650	0.4362	720	0.0681
380	0.0009	450	0.7881	520	0.5516	590	0.9426	660	0.3482	730	0.0513
390	0.0011	460	0.8854	530	0.6616	600	0.9058	670	0.2708	740	0.0387
400	0.0018	470	0.4570	540	0.7406	610	0.8332	680	0.2089	750	0.0291
410	0.0060	480	0.2531	550	0.8071	620	0.7412	690	0.1591	760	0.0221
420	0.0324	490	0.1980	560	0.8679	630	0.6375	700	0.1203	770	0.0168
430	0.1202	500	0.2581	570	0.9178	640	0.5334	710	0.0906	780	0.0148

**CRI & CCT**

x	0.3836
y	0.3835
u'	0.2245
v'	0.5050
CRI	75.20
CCT	3964
Duv	0.00222

**R Values**

R1	72.10
R2	83.44
R3	90.65
R4	70.90
R5	70.39
R6	74.81
R7	83.46
R8	55.51
R9	-16.73
R10	58.79
R11	64.79
R12	43.33
R13	74.61
R14	94.35



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

## 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 Released by:



Jeff Ahn  
Engineering Manager

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 : L061600401.IES**

**DESCRIPTIVE INFORMATION (From Photometric File)**

IESNA:LM-63-2002  
 [TEST] L061600401  
 [TESTLAB] LIGHT LABORATORY, INC.  
 [ISSUEDATE] 6/7/2016  
 [MANUFAC] REVOLUTION LIGHTING TECHNOLOGIES (RVLT)  
 [LUMCAT] 281402-003-M0X  
 [LUMINAIRE] 50W WALL WASHER 4000K  
 [BALLASTCAT] CUSTOM DRIVER  
 [LAMPPOSITION] 0,0  
 [LAMPCAT] N/A  
 [OTHER] INDICATING THE CANDELA VALUES ARE ABSOLUTE AND  
 [MORE] SHOULD NOT BE FACTORED FOR DIFFERENT LAMP RATINGS.  
 [INPUT] 120VAC, 50.41W  
 [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	5987
Downward Total Efficiency	N.A. (absolute)
Total Luminaire Efficiency	N.A. (absolute)
Luminaire Efficacy Rating (LER)	119
Total Luminaire Watts	50.41
Ballast Factor	1.00
Upward Waste Light Ratio	0.00
Maximum Candela	2525
Maximum Candela Angle	0H 5V
Maximum Candela (<90 Degrees Vertical)	2525
Maximum Candela Angle (<90 Degrees Vertical)	0H 5V
Maximum Candela At 90 Degrees Vertical	0 (0.0% Luminaire Lumens)
Maximum Candela from 80 to <90 Degrees Vertical	124 (2.1% Luminaire Lumens)
Cutoff Classification (deprecated)	N.A. (absolute)

**IES ROAD REPORT**  
**PHOTOMETRIC FILENAME : L061600401.IES**

**LUMINAIRE CLASSIFICATION SYSTEM (LCS)**

	Lumens	% Lamp	% Luminaire
FL - Front-Low (0-30)	997.0	N.A.	16.7
FM - Front-Medium (30-60)	2133.2	N.A.	35.6
FH - Front-High (60-80)	668.1	N.A.	11.2
FVH - Front-Very High (80-90)	19.8	N.A.	0.3
BL - Back-Low (0-30)	839.8	N.A.	14.0
BM - Back-Medium (30-60)	1113.7	N.A.	18.6
BH - Back-High (60-80)	204.4	N.A.	3.4
BVH - Back-Very High (80-90)	10.8	N.A.	0.2
UL - Uplight-Low (90-100)	0.0	N.A.	0.0
UH - Uplight-High (100-180)	0.0	N.A.	0.0
Total	5986.8	N.A.	100.0
BUG Rating	B2-U0-G1		

**ZONAL LUMEN SUMMARY**

Zone	%
0-20	14.5
0-30	30.7
0-40	49.7
0-60	84.9
0-80	99.5
0-90	100
10-90	96.2
20-40	35.2
20-50	54.3
40-70	45.7
60-80	14.6
70-80	4
80-90	0.5
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 : L061600401.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	2444	2444	2444	2444	2444	2444	2444	2444	2444	2444
5.0	2525	2525	2524	2522	2519	2515	2509	2505	2497	2491
10.0	2441	2441	2439	2435	2431	2429	2426	2426	2429	2435
15.0	2502	2500	2494	2481	2465	2442	2418	2395	2381	2366
20.0	2500	2501	2499	2480	2433	2412	2421	2431	2423	2393
25.0	2459	2455	2442	2435	2450	2492	2453	2371	2394	2315
30.0	2424	2422	2416	2402	2367	2361	2395	2364	2331	2360
35.0	2321	2321	2317	2318	2306	2279	2269	2282	2231	2268
37.5	2289	2282	2266	2247	2235	2235	2239	2208	2204	2171
40.0	2273	2275	2269	2258	2230	2186	2162	2171	2147	2129
42.5	2154	2154	2152	2155	2164	2178	2155	2098	2082	2070
45.0	2083	2081	2074	2066	2052	2051	2072	2090	2032	1990
47.5	2014	2010	2002	1994	1982	1972	1960	1966	1999	1942
50.0	1944	1942	1938	1927	1914	1897	1885	1875	1863	1897
52.5	1837	1839	1838	1834	1833	1827	1812	1791	1775	1756
55.0	1686	1687	1687	1692	1702	1714	1717	1712	1685	1662
57.5	1530	1536	1554	1572	1571	1558	1576	1596	1597	1569
60.0	1313	1312	1308	1311	1344	1408	1447	1439	1464	1470
62.5	1171	1176	1190	1207	1205	1193	1205	1286	1315	1320
65.0	990	987	983	979	988	1029	1080	1077	1095	1162
67.5	793	796	806	831	859	867	859	890	947	920
70.0	664	669	679	684	677	670	697	749	736	751
72.5	482	481	477	473	472	501	554	565	557	572
75.0	281	281	279	281	300	345	381	377	398	405
77.5	124	124	123	126	140	175	205	205	221	240
80.0	90	90	91	91	92	92	91	89	88	116
85.0	28	28	29	29	29	30	30	29	29	28
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	2444	2444	2444	2444	2444	2444	2444	2444	2444	2444
5.0	2481	2473	2466	2460	2452	2443	2435	2423	2411	2400
10.0	2443	2448	2450	2448	2440	2426	2412	2392	2372	2348
15.0	2357	2351	2359	2378	2390	2390	2370	2349	2319	2280
20.0	2342	2304	2285	2277	2294	2318	2315	2289	2247	2200
25.0	2334	2318	2250	2206	2189	2210	2233	2209	2164	2099
30.0	2266	2204	2228	2171	2103	2083	2123	2116	2062	1983
35.0	2191	2218	2139	2097	2040	1965	1980	2002	1939	1851
37.5	2198	2134	2074	2005	2011	1910	1903	1938	1876	1779
40.0	2087	2109	2099	1996	1957	1860	1822	1869	1802	1697
42.5	2045	2001	1963	1924	1863	1808	1740	1784	1727	1624
45.0	1973	1960	1932	1916	1790	1765	1658	1703	1631	1512
47.5	1894	1866	1830	1792	1722	1699	1570	1576	1520	1408
50.0	1834	1798	1752	1725	1714	1568	1456	1470	1424	1302
52.5	1790	1697	1667	1624	1542	1452	1381	1340	1286	1172
55.0	1638	1655	1554	1484	1467	1359	1268	1191	1168	1061
57.5	1531	1499	1459	1388	1302	1260	1175	1063	1044	934
60.0	1423	1372	1342	1233	1176	1116	1032	933	929	822
62.5	1319	1241	1167	1141	1057	987	888	810	800	703
65.0	1132	1109	1035	975	899	845	770	689	677	593
67.5	963	924	892	821	788	687	651	568	560	481

**IES ROAD REPORT**  
**PHOTOMETRIC FILENAME : L061600401.IES**

**CANDELA TABULATION - (Cont.)**

<b>70.0</b>	729	743	725	679	622	570	520	474	441	377
<b>72.5</b>	543	551	545	528	487	444	392	366	333	283
<b>75.0</b>	386	377	379	369	349	307	271	250	233	196
<b>77.5</b>	233	230	229	221	209	188	164	150	143	118
<b>80.0</b>	111	124	121	113	101	87	76	68	65	53
<b>85.0</b>	26	25	23	21	20	19	18	17	17	17
<b>90.0</b>	0	0	0	0	0	0	0	0	0	0

**Vert. Horizontal Angles**  
**Angles**

	<u><b>100</b></u>	<u><b>105</b></u>	<u><b>110</b></u>	<u><b>115</b></u>	<u><b>120</b></u>	<u><b>125</b></u>	<u><b>130</b></u>	<u><b>135</b></u>	<u><b>140</b></u>	<u><b>145</b></u>
<b>0.0</b>	2444	2444	2444	2444	2444	2444	2444	2444	2444	2444
<b>5.0</b>	2390	2380	2371	2361	2354	2346	2336	2328	2320	2313
<b>10.0</b>	2325	2303	2281	2264	2249	2236	2227	2219	2211	2204
<b>15.0</b>	2246	2211	2185	2168	2155	2143	2133	2124	2115	2107
<b>20.0</b>	2152	2114	2092	2075	2058	2045	2036	2024	2018	2008
<b>25.0</b>	2042	2007	1983	1963	1953	1940	1926	1906	1881	1827
<b>30.0</b>	1925	1892	1866	1850	1838	1810	1764	1678	1580	1502
<b>35.0</b>	1791	1759	1739	1720	1684	1581	1460	1377	1354	1336
<b>37.5</b>	1722	1691	1672	1642	1567	1441	1336	1305	1283	1223
<b>40.0</b>	1646	1620	1600	1557	1431	1296	1257	1232	1148	1036
<b>42.5</b>	1574	1543	1514	1435	1284	1211	1181	1081	969	938
<b>45.0</b>	1452	1429	1395	1264	1139	1112	1032	914	887	851
<b>47.5</b>	1364	1344	1277	1124	1057	996	856	827	771	689
<b>50.0</b>	1245	1213	1114	976	944	816	770	709	635	619
<b>52.5</b>	1132	1101	968	886	805	705	655	577	550	498
<b>55.0</b>	1022	971	815	777	647	610	526	490	448	390
<b>57.5</b>	905	826	717	631	563	478	438	398	347	300
<b>60.0</b>	793	680	613	507	447	399	354	311	270	269
<b>62.5</b>	675	559	490	427	361	315	275	243	238	231
<b>65.0</b>	554	462	381	319	277	242	214	207	204	203
<b>67.5</b>	431	362	295	243	204	183	178	172	171	170
<b>70.0</b>	317	257	212	181	152	146	145	144	143	142
<b>72.5</b>	228	187	148	124	120	119	118	118	116	115
<b>75.0</b>	153	121	101	94	93	93	92	91	91	90
<b>77.5</b>	88	73	68	68	68	68	67	67	66	66
<b>80.0</b>	46	44	44	45	45	45	45	45	45	45
<b>85.0</b>	17	16	16	16	16	17	17	17	17	17
<b>90.0</b>	0	0	0	0	0	0	0	0	0	0

**Vert. Horizontal Angles**  
**Angles**

	<u><b>150</b></u>	<u><b>155</b></u>	<u><b>160</b></u>	<u><b>165</b></u>	<u><b>170</b></u>	<u><b>175</b></u>	<u><b>180</b></u>
<b>0.0</b>	2444	2444	2444	2444	2444	2444	2444
<b>5.0</b>	2305	2300	2295	2287	2285	2282	2282
<b>10.0</b>	2198	2191	2185	2180	2176	2174	2173
<b>15.0</b>	2101	2094	2087	2082	2078	2076	2075
<b>20.0</b>	1994	1983	1973	1962	1950	1944	1942
<b>25.0</b>	1769	1715	1666	1631	1607	1593	1587
<b>30.0</b>	1464	1450	1439	1431	1424	1421	1420
<b>35.0</b>	1309	1250	1186	1139	1106	1090	1086
<b>37.5</b>	1131	1059	1031	1020	1015	1012	1011
<b>40.0</b>	988	975	966	949	923	904	896
<b>42.5</b>	923	872	810	772	758	755	754
<b>45.0</b>	763	719	711	706	686	669	664
<b>47.5</b>	675	646	593	571	568	565	565

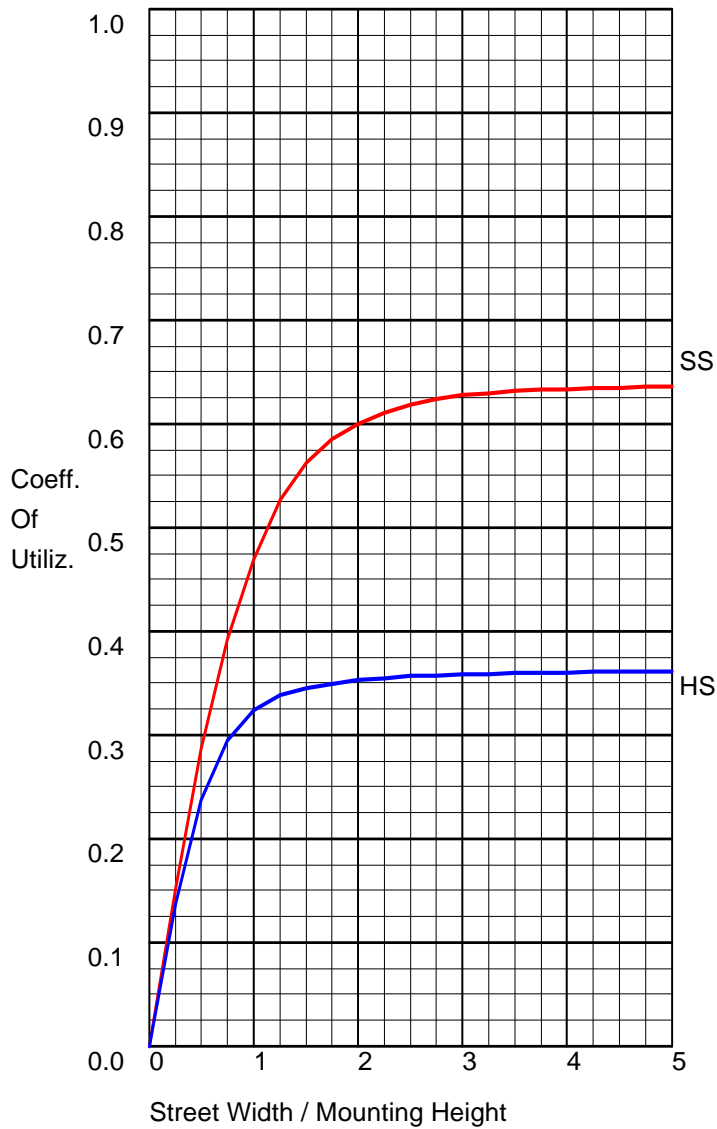


**IES ROAD REPORT**  
**PHOTOMETRIC FILENAME : L061600401.IES**

**CANDELA TABULATION - (Cont.)**

<b>50.0</b>	553	534	519	477	451	446	446
<b>52.5</b>	477	419	416	385	352	345	345
<b>55.0</b>	379	322	322	324	322	320	320
<b>57.5</b>	297	295	289	283	281	281	281
<b>60.0</b>	261	257	255	255	254	254	254
<b>62.5</b>	231	230	229	228	228	227	227
<b>65.0</b>	203	202	201	201	200	200	199
<b>67.5</b>	169	168	167	166	166	165	165
<b>70.0</b>	141	140	139	138	138	137	137
<b>72.5</b>	114	113	113	112	111	111	111
<b>75.0</b>	89	88	88	87	87	86	86
<b>77.5</b>	65	65	64	64	63	63	63
<b>80.0</b>	45	45	44	44	44	44	43
<b>85.0</b>	17	17	17	17	17	17	17
<b>90.0</b>	0	0	0	0	0	0	0

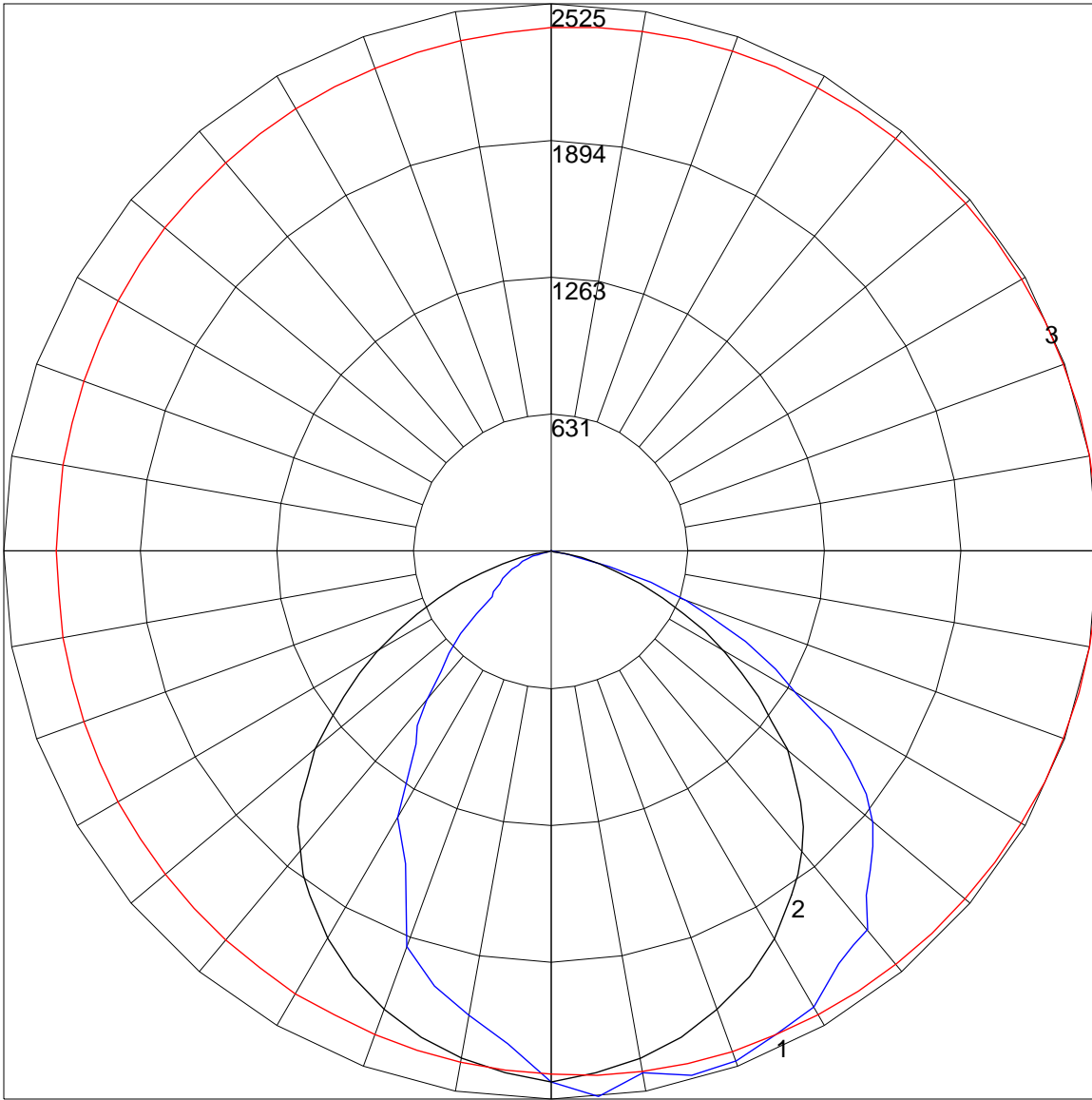
**COEFFICIENTS OF UTILIZATION**



**FLUX DISTRIBUTION**

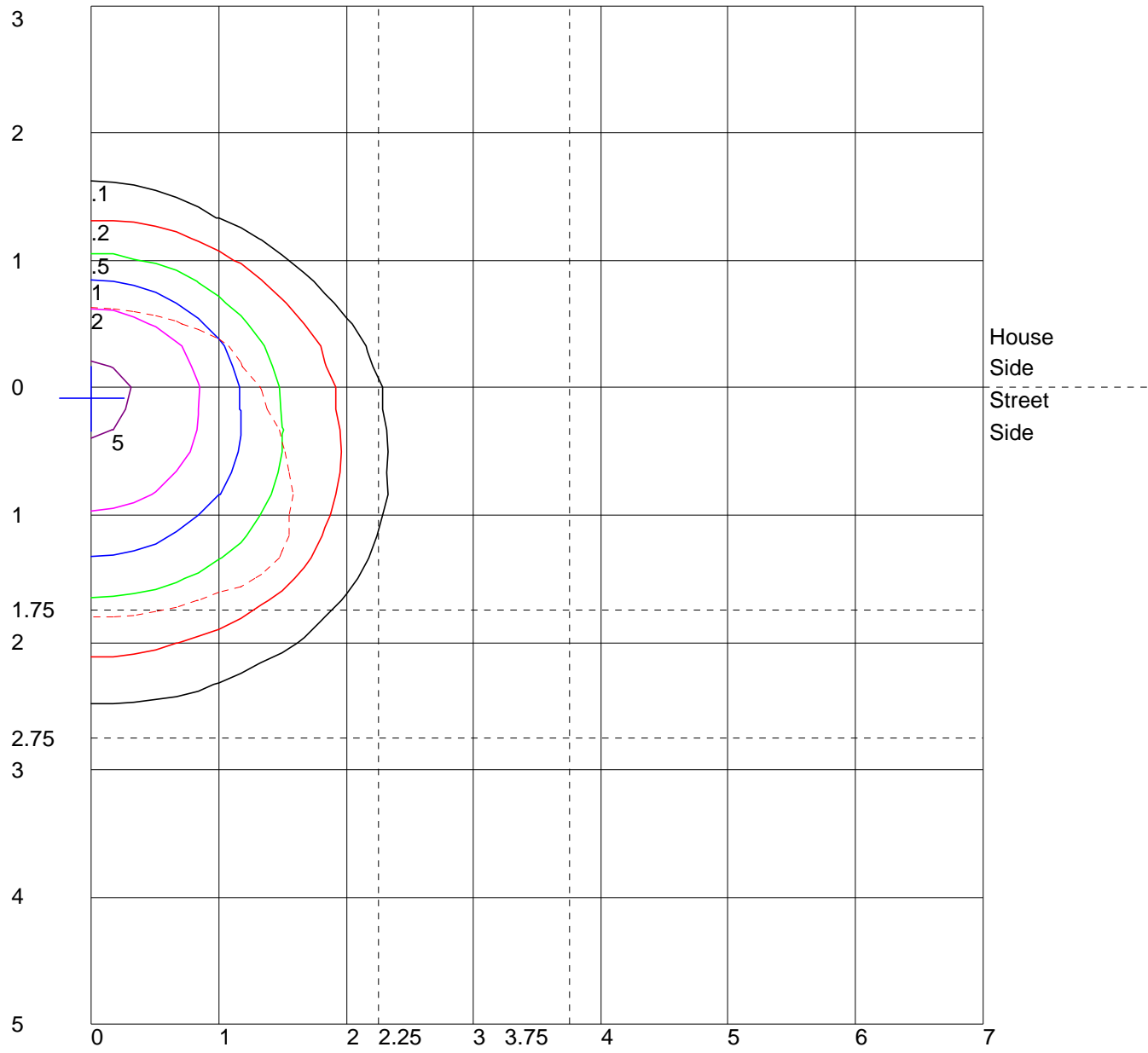
	Lumens	Percent Of Luminaire
Downward Street Side	3818.1	63.8
Downward House Side	2168.7	36.2
Downward Total	5986.8	100.0
Upward Street Side	0.0	0.0
Upward House Side	0.0	0.0
Upward Total	0.0	0.0
<b>Total Flux</b>	<b>5986.8</b>	<b>100.0</b>

POLAR GRAPH



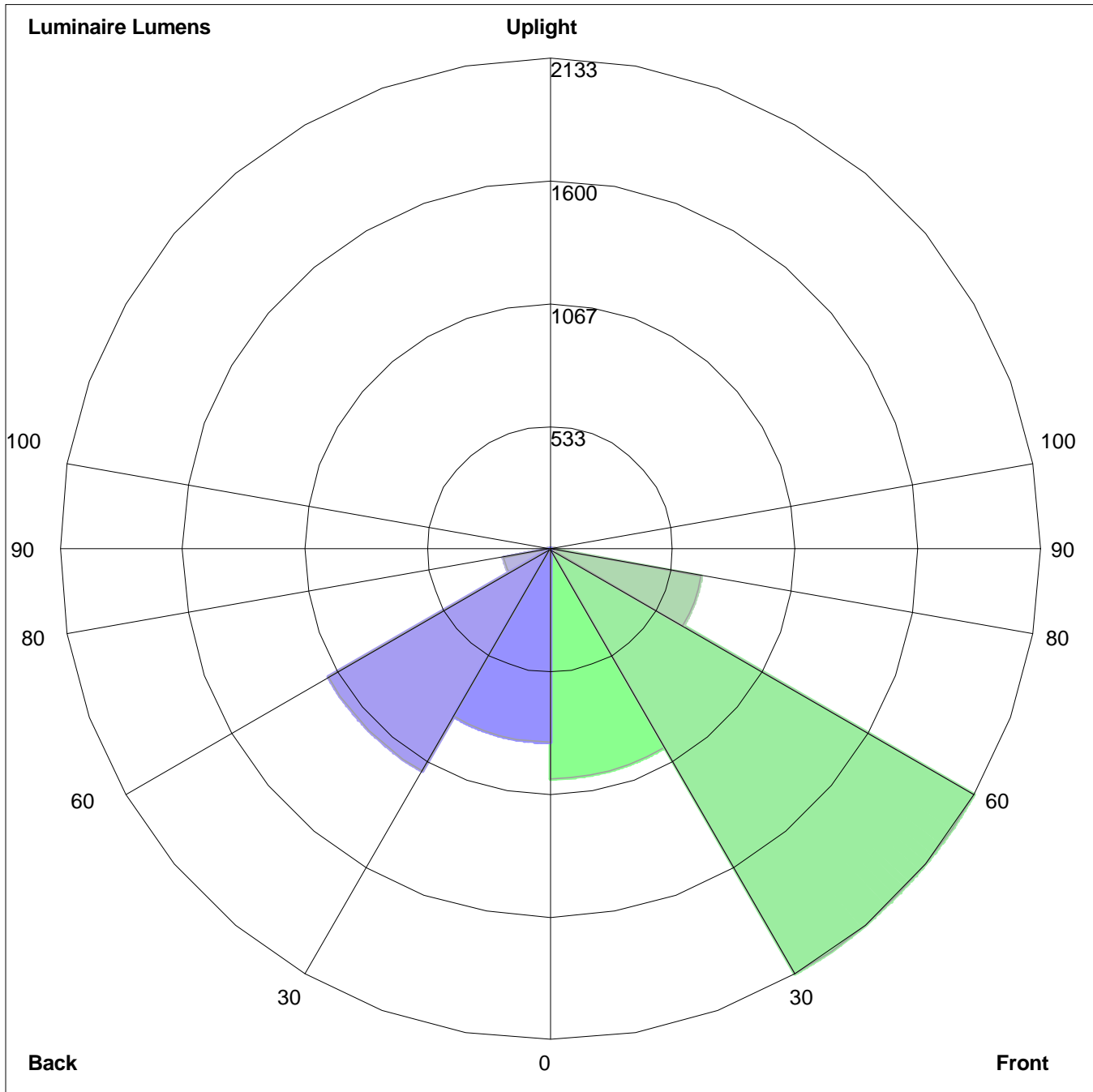
Maximum Candela = 2525 Located At Horizontal Angle = 0, Vertical Angle = 5  
# 1 - Vertical Plane Through Horizontal Angles (0 - 180) (Through Max. Cd.)  
# 2 - Vertical Plane Through Horizontal Angles (90 - 270)  
# 3 - Horizontal Cone Through Vertical Angle (5) (Through Max. Cd.)

ISOFOOTCANDLE LINES OF HORIZONTAL ILLUMINANCE



Distance In Units Of Mounting Height  
 Values Based On 20 Foot Mounting Height  
 1/2 Maximum Candela Trace Shown As Dashed Curve  
 (+) = Maximum Candela Point

LUMINAIRE CLASSIFICATION SYSTEM (LCS) GRAPH



Luminaire Lumens:  
Front: Low=997.0, Medium=2133.2, High=668.1, Very High=19.8  
Back: Low=839.8, Medium=1113.7, High=204.4, Very High=10.8  
Uplight: Low=0.0, High=0.0

BUG Rating : B2-U0-G1