



8165 E Kaiser Blvd. Anaheim, CA 92808
 p. 714.282.2270
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Report No: L091604006

Date: 9/26/2016



NVLAP LAB CODE 200927-0

Report No: L091604006

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

Model Number: GCJ0-15H-MV-CW-5-XX-300

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 GCJ0-15H-MV-CW-5-XX-300 . Received in working and undamaged condition. No modifications were necessary.

Testing Condition: Fixture is tested with no special conditions.

Sample Arrival Date: 9/12/16

Date of Tests: 9/24/16 - 9/24/16

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.

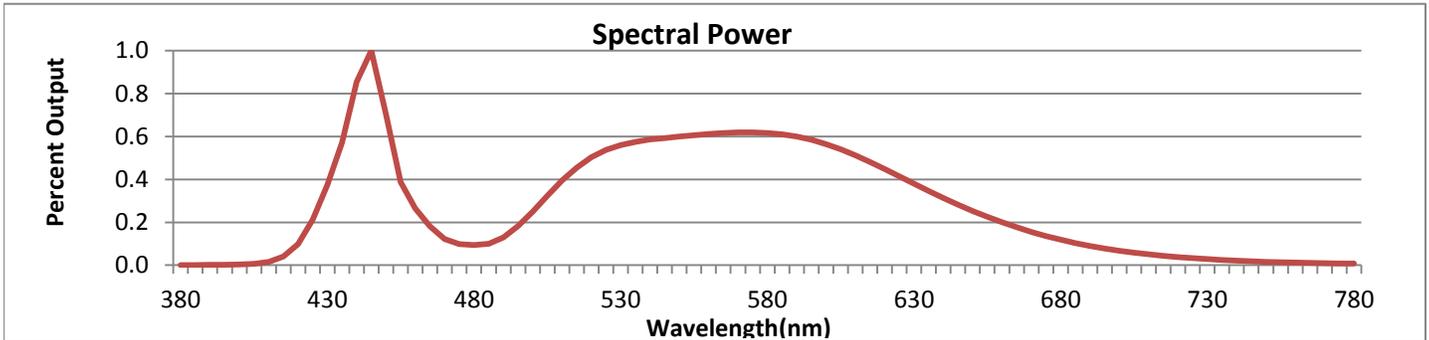
Test Summary

Manufacturer:	Leotek Electronics USA, LLC
Model Number:	GCJ0-15H-MV-CW-5-XX-300
Driver Model Number:	LITEON PA-1600-31SL
Total Lumens:	1967.20
Input Voltage (VAC/60Hz):	120.00
Input Current (Amp):	0.13
Input Power (W):	14.95
Input Power Factor:	0.95
Current ATHD @ 120V(%):	16%
Current ATHD @ 277V(%):	N/A
Efficacy:	132
Color Rendering Index (CRI):	72
Correlated Color Temperature (K):	4808
Chromaticity Coordinate x:	0.3519
Chromaticity Coordinate y:	0.3659
Ambient Temperature (°C):	25.0
Stabilization Time (Hours):	0:35
Total Operating Time (Hours):	1:25
Off State Power(W):	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.



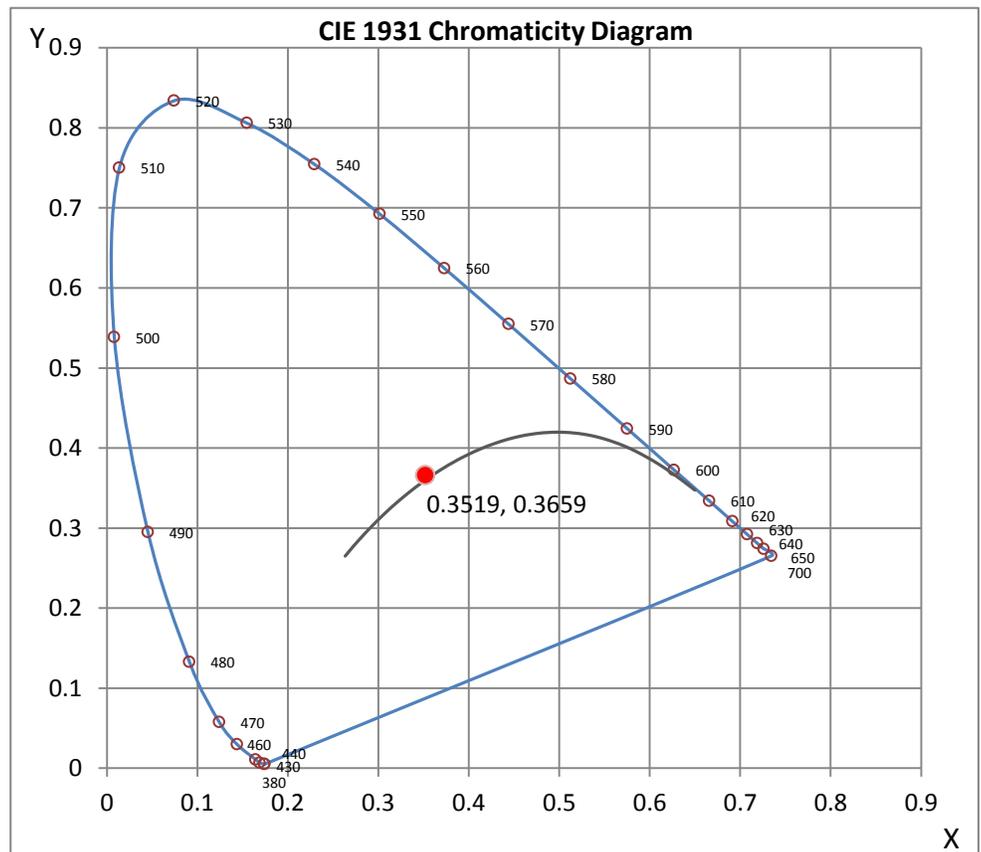
Wavelength	W/m ² nm	440	0.8555	510	0.3946	580	0.6164	650	0.2535	720	0.0379
380	0.0009	450	0.7038	520	0.5031	590	0.6000	660	0.2004	730	0.0285
390	0.0015	460	0.2652	530	0.5600	600	0.5648	670	0.1549	740	0.0213
400	0.0032	470	0.1216	540	0.5861	610	0.5124	680	0.1187	750	0.0161
410	0.0153	480	0.0935	550	0.6001	620	0.4490	690	0.0898	760	0.0122
420	0.0987	490	0.1300	560	0.6120	630	0.3807	700	0.0676	770	0.0093
430	0.3739	500	0.2503	570	0.6195	640	0.3142	710	0.0506	780	0.0081

CRI & CCT

x	0.3519
y	0.3659
u'	0.2105
v'	0.4925
CRI	72.20
CCT	4808
Duv	0.00440

R Values

R1	70.51
R2	75.57
R3	80.20
R4	74.20
R5	70.81
R6	67.24
R7	80.28
R8	59.14
R9	-22.54
R10	42.87
R11	72.84
R12	44.78
R13	70.44
R14	88.46



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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 : JEFF AHN

Test Report Released by:

Test Report Reviewed by:

Jeff Ahn
 Engineering Manager

Steve Kang
 Quality Assurance

**Attached are photometric data reports. Total number of pages: 12*

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



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Photometric Test Report

IES ROAD REPORT
PHOTOMETRIC FILENAME : L091604006.IES

DESCRIPTIVE INFORMATION (From Photometric File)

IESNA:LM-63-2002
 [TEST] L091604006
 [TESTLAB] LIGHT LABORATORY, INC.
 [ISSUEDATE] 9/26/2016
 [MANUFAC] Leotek Electronics USA, LLC
 [LUMCAT] GCJ0-15H-MV-CW-5-XX-300
 [LUMINAIRE] 18.25"L. X 9.5"W. X 4.5"H. LED STREET LIGHT
 [BALLASTCAT] LITEON PA-1600-31SL
 [OTHER] INDICATING THE CANDELA VALUES ARE ABSOLUTE AND
 [MORE] SHOULD NOT BE FACTORED FOR DIFFERENT LAMP RATINGS.
 [_INPUT] 120VAC, 14.95W
 [_TEST PROCEDURE] IESNA:LM-79-08

CHARACTERISTICS

IES Classification	Type VS
Longitudinal Classification	Short
Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Luminaire Lumens	1967
Downward Total Efficiency	N.A. (absolute)
Total Luminaire Efficiency	N.A. (absolute)
Luminaire Efficacy Rating (LER)	132
Total Luminaire Watts	14.95
Ballast Factor	1.00
Upward Waste Light Ratio	0.00
Maximum Candela	838
Maximum Candela Angle	50H 65V
Maximum Candela (<90 Degrees Vertical)	838
Maximum Candela Angle (<90 Degrees Vertical)	50H 65V
Maximum Candela At 90 Degrees Vertical	0 (0.0% Luminaire Lumens)
Maximum Candela from 80 to <90 Degrees Vertical	25 (1.3% Luminaire Lumens)
Cutoff Classification (deprecated)	N.A. (absolute)

IES ROAD REPORT
PHOTOMETRIC FILENAME : L091604006.IES

LUMINAIRE CLASSIFICATION SYSTEM (LCS)

	Lumens	% Lamp	% Luminaire
FL - Front-Low (0-30)	110.8	N.A.	5.6
FM - Front-Medium (30-60)	486.0	N.A.	24.7
FH - Front-High (60-80)	383.4	N.A.	19.5
FVH - Front-Very High (80-90)	3.4	N.A.	0.2
BL - Back-Low (0-30)	110.8	N.A.	5.6
BM - Back-Medium (30-60)	486.0	N.A.	24.7
BH - Back-High (60-80)	383.4	N.A.	19.5
BVH - Back-Very High (80-90)	3.4	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	1967.2	N.A.	100.0
BUG Rating	B1-U0-G0		

ZONAL LUMEN SUMMARY

Zone	%
0-20	4.4
0-30	11.3
0-40	21.8
0-60	60.7
0-80	99.7
0-90	100
10-90	99
20-40	17.4
20-50	32.3
40-70	69.2
60-80	39
70-80	8.6
80-90	0.3
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 : L091604006.IES

CANDELA TABULATION

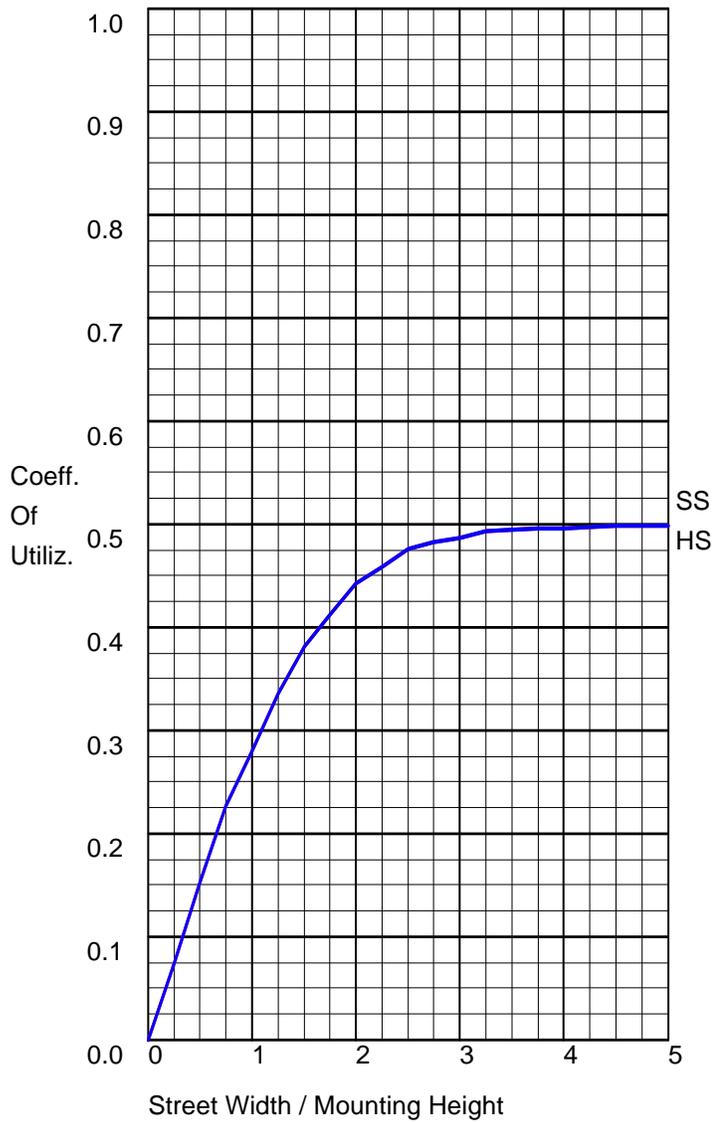
Vert. Angles	Horizontal Angles									
	<u>0</u>	<u>5</u>	<u>10</u>	<u>15</u>	<u>20</u>	<u>25</u>	<u>30</u>	<u>35</u>	<u>40</u>	<u>45</u>
0.0	187	187	187	187	187	187	187	187	187	187
2.5	190	190	190	189	190	189	190	190	189	189
5.0	196	197	196	196	196	196	196	196	195	196
7.5	203	203	203	203	203	204	204	204	204	205
10.0	211	211	212	212	212	214	214	214	214	216
12.5	222	221	221	222	223	225	225	226	227	228
15.0	232	231	231	232	234	237	238	239	241	242
17.5	240	242	242	243	246	248	250	252	255	255
20.0	253	254	254	255	260	260	263	266	270	269
22.5	265	266	267	270	273	276	278	282	286	286
25.0	277	276	278	282	287	291	295	302	306	307
27.5	288	287	288	293	298	302	309	320	328	333
30.0	296	295	297	302	307	313	320	332	342	347
32.5	302	301	304	308	316	321	329	339	348	352
35.0	306	308	310	314	323	328	337	345	352	355
37.5	313	315	319	321	330	336	344	352	358	361
40.0	323	325	328	331	339	345	351	358	366	368
42.5	337	337	339	344	350	356	361	368	375	378
45.0	357	356	358	362	368	372	377	384	390	393
47.5	379	379	381	384	392	398	402	410	414	417
50.0	402	403	407	412	420	430	438	447	453	456
52.5	436	439	441	450	461	473	485	497	507	512
55.0	471	473	479	495	509	527	545	564	577	584
56.0	478	480	488	506	525	551	572	595	609	617
57.0	479	482	491	511	538	569	599	625	640	650
58.0	478	481	491	516	544	583	624	656	674	684
59.0	475	479	491	515	546	590	639	685	709	717
60.0	478	482	494	513	546	591	646	702	740	748
61.0	484	489	501	519	548	593	651	709	765	778
62.0	498	502	513	528	553	591	646	713	779	803
63.0	510	514	525	538	564	596	644	711	778	818
64.0	515	520	531	544	570	602	644	705	776	824
65.0	512	517	528	542	571	605	646	697	766	817
66.0	500	505	515	530	559	597	640	694	755	801
67.0	483	488	496	511	538	576	625	683	743	784
68.0	458	464	473	487	513	551	601	659	721	754
69.0	421	427	441	458	483	518	568	632	695	715
70.0	351	358	374	399	433	477	532	594	657	656
71.0	270	276	292	318	357	410	473	546	604	593
72.0	202	207	219	236	268	319	388	475	519	531
73.0	141	146	158	173	196	232	292	371	425	452
74.0	91	96	107	121	139	164	204	258	318	352
75.0	46	49	60	76	90	109	133	169	215	249
76.0	26	27	33	44	53	65	80	106	134	159
77.0	19	20	22	27	31	37	45	62	79	90
78.0	15	16	17	20	22	24	28	34	42	51
79.0	12	13	14	16	18	19	20	23	27	33
80.0	11	11	12	14	15	15	16	17	21	25
82.5	8	8	8	9	10	10	10	10	10	11
85.0	6	6	6	6	6	6	6	6	6	5
87.5	4	4	5	5	5	5	4	4	4	3
90.0	0	0	0	0	0	0	0	0	0	0

IES ROAD REPORT
PHOTOMETRIC FILENAME : L091604006.IES

CANDELA TABULATION - (Cont.)

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>
0.0	187	187	187	187	187	187	187	187	187
2.5	190	190	190	190	190	190	190	190	190
5.0	196	197	196	196	195	196	196	196	196
7.5	204	205	204	203	203	203	204	204	203
10.0	216	215	214	213	213	212	212	213	213
12.5	228	226	225	224	223	222	222	222	222
15.0	241	239	237	235	234	233	232	232	232
17.5	255	253	250	247	246	244	244	243	242
20.0	268	268	264	261	259	257	256	254	254
22.5	285	283	281	277	274	271	268	267	266
25.0	306	302	298	294	288	283	279	278	277
27.5	329	320	312	306	300	294	290	289	288
30.0	342	332	322	316	310	304	298	296	296
32.5	348	339	332	325	318	312	306	303	302
35.0	353	347	340	333	326	319	313	308	307
37.5	360	355	348	341	334	326	321	316	314
40.0	367	363	356	350	344	336	329	326	325
42.5	377	372	367	361	355	347	342	339	340
45.0	392	388	383	379	371	364	359	358	358
47.5	415	411	407	402	394	387	382	379	378
50.0	453	447	441	434	425	416	409	405	404
52.5	508	497	486	476	464	453	444	440	439
55.0	579	563	545	529	512	497	487	481	481
56.0	611	594	570	552	533	517	505	499	499
57.0	644	625	598	576	554	538	524	518	517
58.0	678	656	625	600	576	558	543	536	534
59.0	709	688	653	623	596	577	562	554	552
60.0	740	715	678	646	616	597	581	572	570
61.0	769	741	703	668	637	614	599	590	588
62.0	793	765	724	686	653	629	610	596	592
63.0	814	780	737	698	660	626	597	578	572
64.0	831	795	749	701	644	591	557	537	532
65.0	838	800	743	669	601	545	520	506	503
66.0	823	788	700	615	556	514	498	488	486
67.0	799	734	637	570	525	489	475	466	464
68.0	740	651	586	532	494	461	449	439	436
69.0	646	577	539	495	455	419	402	392	389
70.0	576	513	483	440	397	365	348	336	331
71.0	517	457	415	378	338	299	271	254	248
72.0	465	392	339	298	247	212	187	172	166
73.0	398	319	252	200	169	147	126	112	108
74.0	311	239	173	134	120	102	86	77	74
75.0	216	159	115	91	80	69	54	43	40
76.0	133	103	75	57	48	38	28	24	22
77.0	78	62	46	34	28	24	19	17	16
78.0	45	37	28	23	19	18	14	13	13
79.0	30	26	20	17	14	13	11	10	10
80.0	23	19	16	14	12	10	9	8	8
82.5	11	10	8	7	7	6	6	6	6
85.0	5	5	5	4	4	4	4	5	5
87.5	3	3	3	3	3	3	3	3	3
90.0	0	0	0	0	0	0	0	0	0

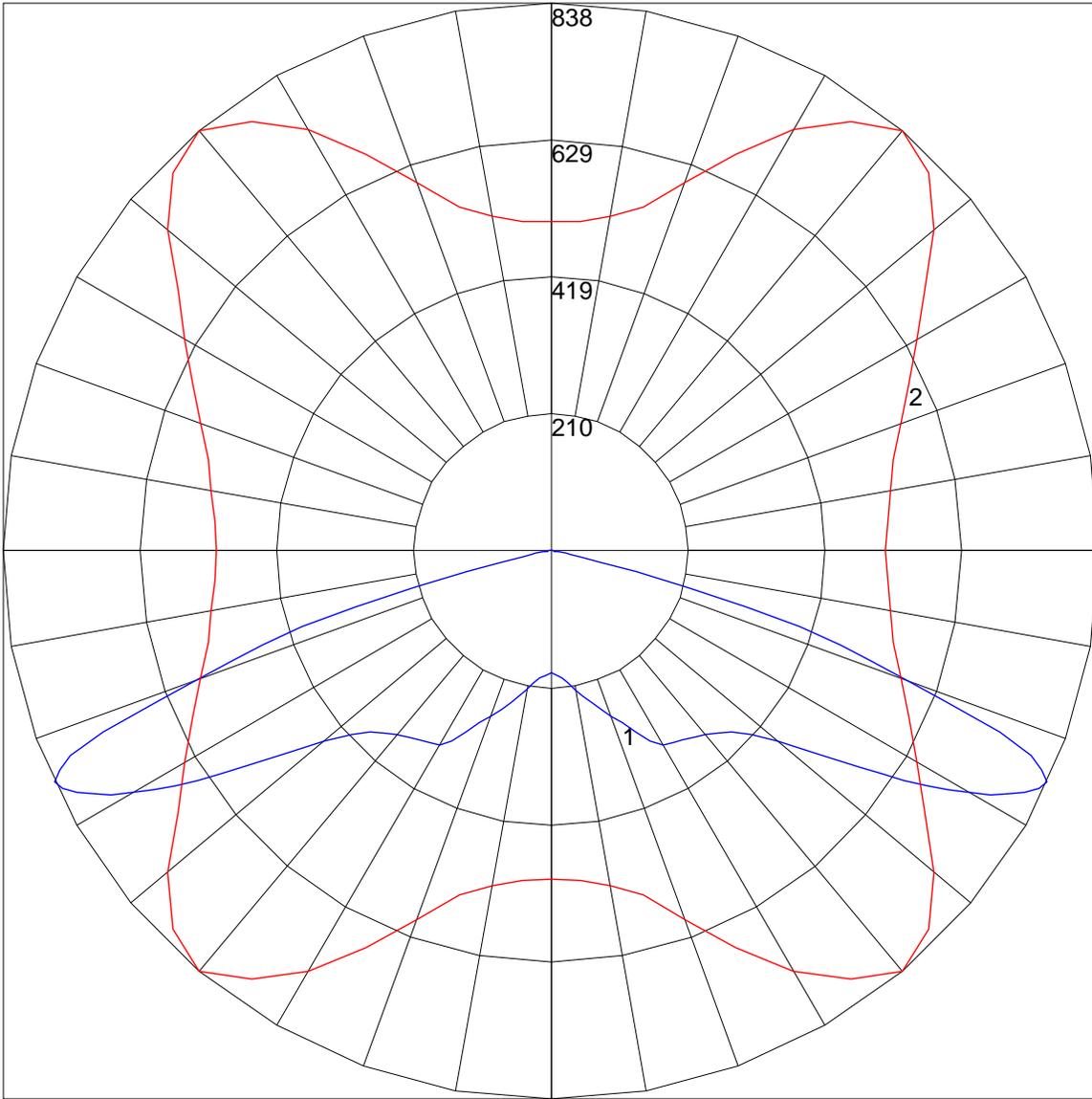
COEFFICIENTS OF UTILIZATION



FLUX DISTRIBUTION

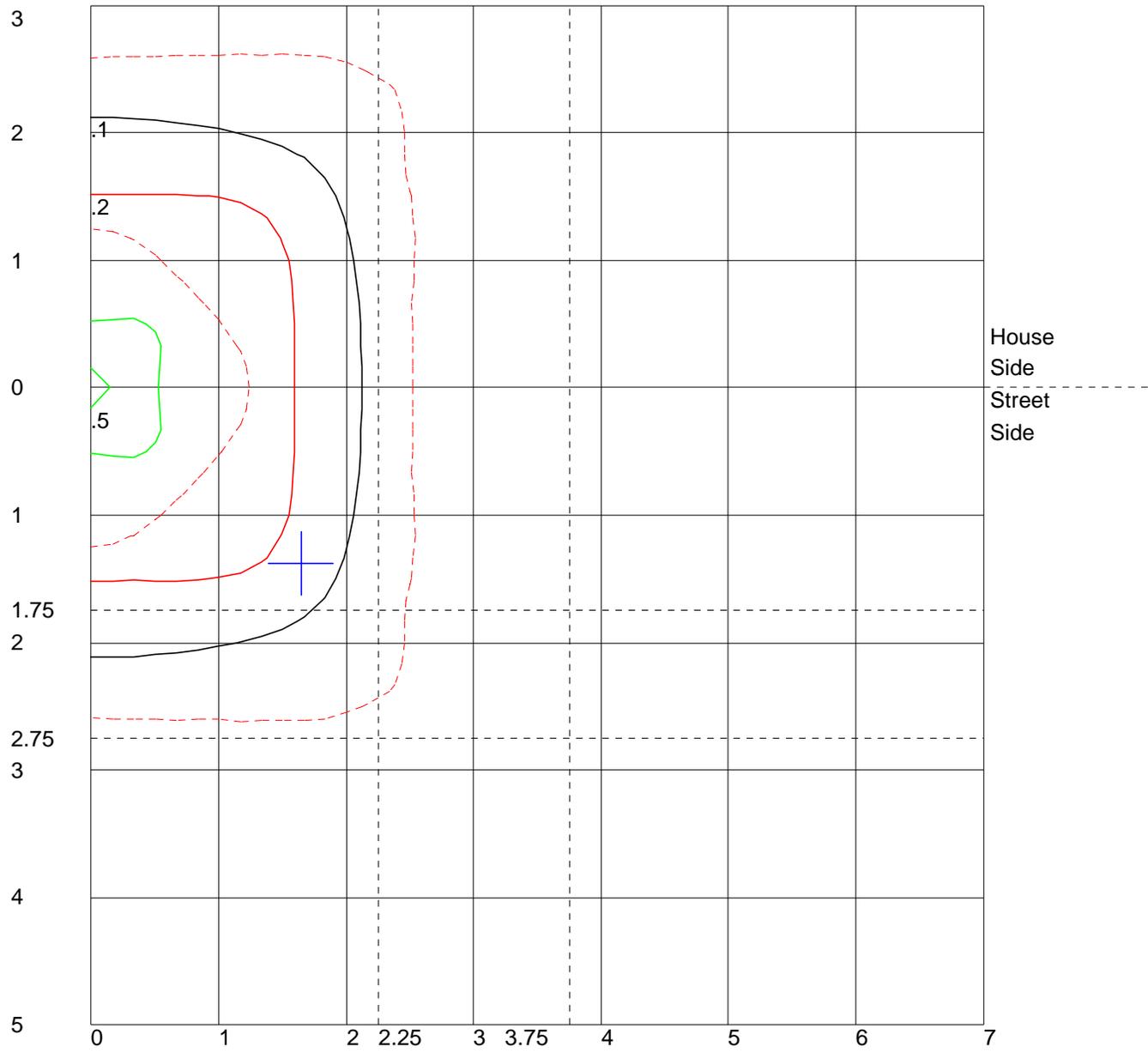
	Lumens	Percent Of Luminaire
Downward Street Side	983.6	50.0
Downward House Side	983.6	50.0
Downward Total	1967.2	100.0
Upward Street Side	0.0	0.0
Upward House Side	0.0	0.0
Upward Total	0.0	0.0
Total Flux	1967.2	100.0

POLAR GRAPH



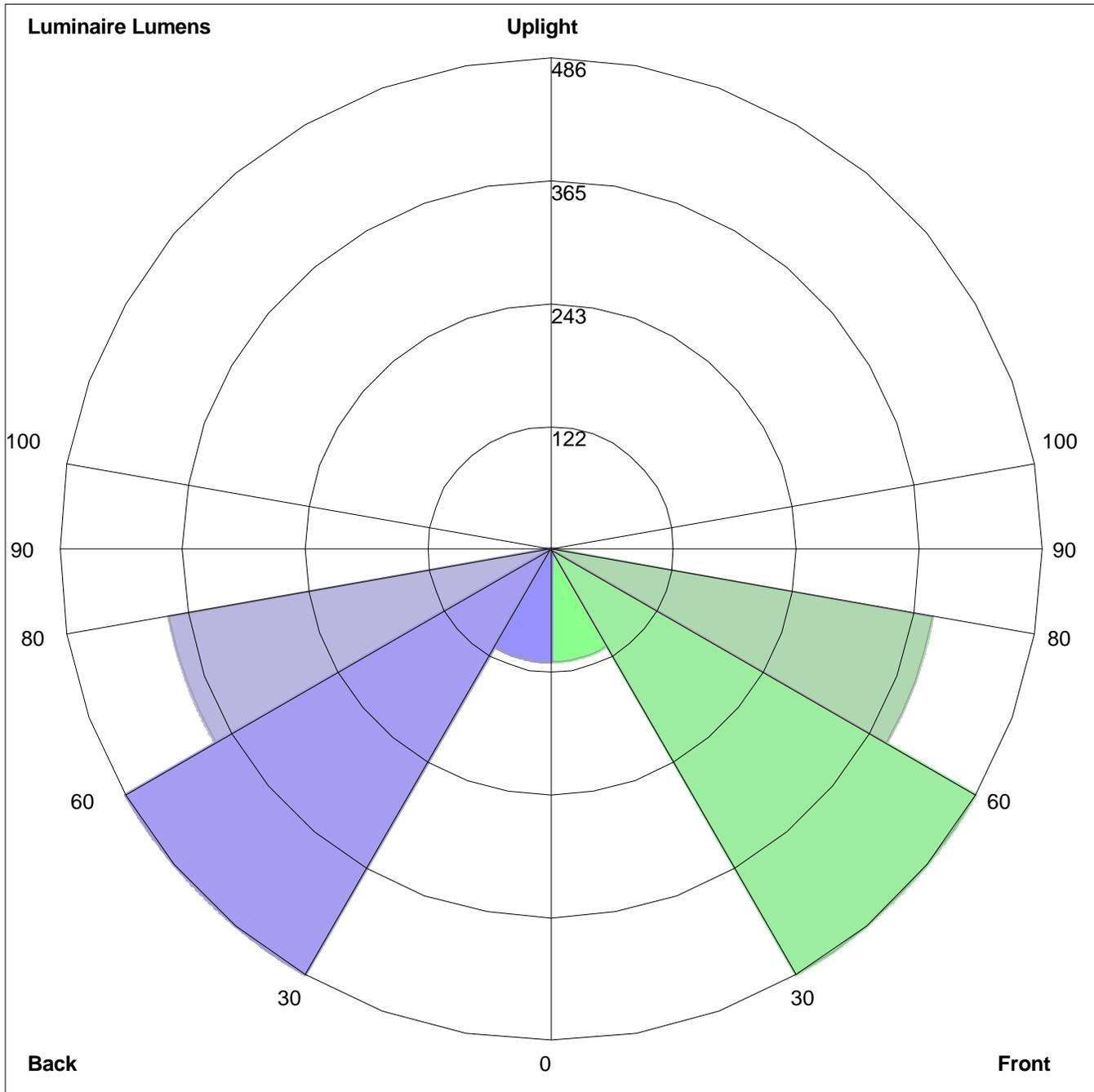
Maximum Candela = 838 Located At Horizontal Angle = 50, Vertical Angle = 65
1 - Vertical Plane Through Horizontal Angles (50 - 230) (Through Max. Cd.)
2 - Horizontal Cone Through Vertical Angle (65) (Through Max. Cd.)

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=110.8, Medium=486.0, High=383.4, Very High=3.4
Back: Low=110.8, Medium=486.0, High=383.4, Very High=3.4
Uplight: Low=0.0, High=0.0

BUG Rating : B1-U0-G0