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Report No: L111407208

Date: 12/11/2014



NVLAP LAB CODE 200927-0

Report No: L111407208

Report Prepared For: Cast Lighting
 1120-A Goffle Rd., Hawthorne, NJ., 07506

Model Number: CSA1LED2

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 CSA1LED2 . Received in working and undamaged condition. No modifications were necessary.

Testing Condition: Fixture is tested with no special conditions.

Sample Arrival Date: 12/8/14

Date of Tests: 12/10/14 - 12/10/14

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	01/04/15
Xitron Power Analysis System	2503AH	MT-EL01	01/09/15
BK Precision DC Power Supply	1747	PSDC-04	01/08/15
Fluke Digital Thermometer	52k/J	MT-TP02-GC	01/04/15
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:	Cast Lighting
Model Number:	CSA1LED2
Driver Model Number:	N/A
Total Lumens:	199.90
Input Voltage (VAC/60Hz):	12.00
Input Current (Amp):	0.40
Input Power (W):	4.41
Input Power Factor:	0.91
Current ATHD @ 12V(%):	43%
Current ATHD @ 24V(%):	N/A
Efficacy:	45
Color Rendering Index (CRI):	82
Correlated Color Temperature (K):	2737
Chromaticity Coordinate x:	0.4601
Chromaticity Coordinate y:	0.4157
Ambient Temperature (°C):	25.0
Stabilization Time (Hours):	0:45
Total Operating Time (Hours):	1:20
Off State Power(W):	0.00

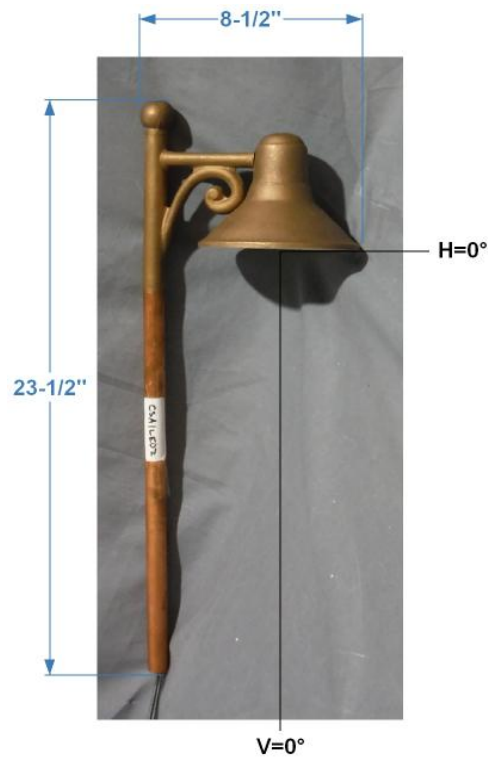
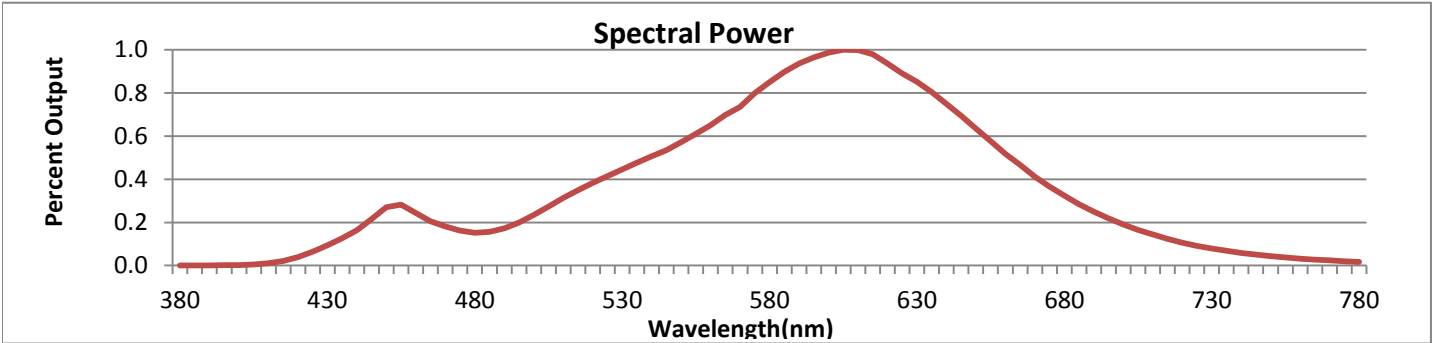


FIG. 1 LUMINAIRE

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



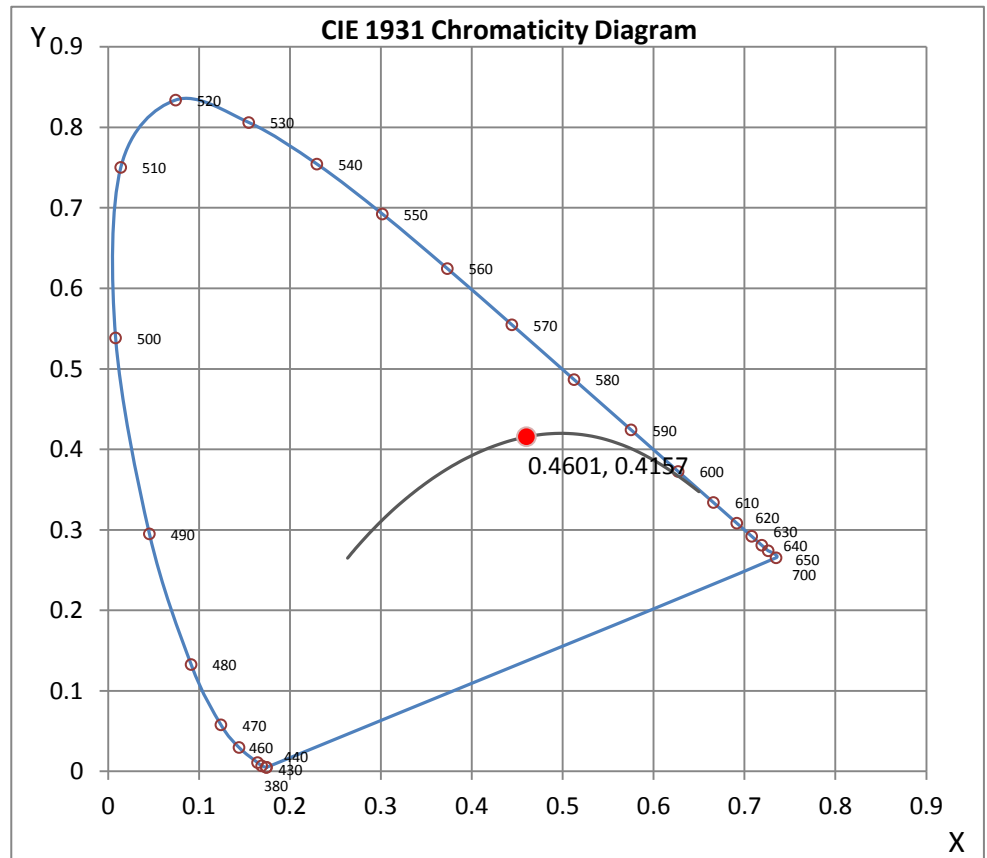
Wavelength	W/m ² nm	440	0.1638	510	0.3132	580	0.8513	650	0.6353	720	0.1055
380	0.0008	450	0.2708	520	0.3838	590	0.9370	660	0.5188	730	0.0790
390	0.0009	460	0.2445	530	0.4463	600	0.9868	670	0.4120	740	0.0584
400	0.0023	470	0.1819	540	0.5059	610	0.9997	680	0.3233	750	0.0431
410	0.0104	480	0.1525	550	0.5713	620	0.9374	690	0.2499	760	0.0313
420	0.0393	490	0.1723	560	0.6504	630	0.8520	700	0.1907	770	0.0236
430	0.0934	500	0.2347	570	0.7351	640	0.7503	710	0.1448	780	0.0174

CRI & CCT

x	0.4601
y	0.4157
u'	0.2604
v'	0.5293
CRI	81.60
CCT	2737
Duv	0.00186

R Values

R1	79.39
R2	89.40
R3	97.45
R4	79.06
R5	78.67
R6	86.75
R7	83.38
R8	58.41
R9	7.56
R10	75.46
R11	76.99
R12	69.69
R13	81.42
R14	98.64



*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 : Wilson Khounlavong

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: 12*



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Photometric Test Report

IES ROAD REPORT
PHOTOMETRIC FILENAME : L111407208.IES

DESCRIPTIVE INFORMATION (From Photometric File)

IESNA:LM-63-2002
 [TEST] L111407208
 [TESTLAB] LIGHT LABORATORY, INC.
 [ISSUEDATE] 12/11/2014
 [MANUFAC] CAST LIGHTING
 [LUMCAT] CSA1LED2
 [LUMINAIRE] 8-1/2"L X 5-3/4"W X 23-1/2"H. LED LUMINAIRE
 [MORE] DIFFUSED LENS
 [BALLASTCAT] N.A.
 [BALLAST] N.A.
 [LAMPPOSITION] 0,0
 [LAMPCAT] N/A
 [OTHER] INDICATING THE CANDELA VALUES ARE ABSOLUTE AND
 [MORE] SHOULD NOT BE FACTORED FOR DIFFERENT LAMP RATINGS.
 [INPUT] 12VAC, 4.41W
 [TEST PROCEDURE] IESNA:LM-79-08

CHARACTERISTICS

IES Classification	Type VS
Longitudinal Classification	Very Short
Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Luminaire Lumens	200
Downward Total Efficiency	N.A. (absolute)
Total Luminaire Efficiency	N.A. (absolute)
Luminaire Efficacy Rating (LER)	45
Total Luminaire Watts	4.41
Ballast Factor	1.00
Upward Waste Light Ratio	0.00
Maximum Candela	94.02
Maximum Candela Angle	0H 0V
Maximum Candela (<90 Degrees Vertical)	94.02
Maximum Candela Angle (<90 Degrees Vertical)	0H 0V
Maximum Candela At 90 Degrees Vertical	0 (0.0% Luminaire Lumens)
Maximum Candela from 80 to <90 Degrees Vertical	1.27 (0.6% Luminaire Lumens)
Cutoff Classification (deprecated)	N.A. (absolute)

IES ROAD REPORT
PHOTOMETRIC FILENAME : L111407208.IES

LUMINAIRE CLASSIFICATION SYSTEM (LCS)

	Lumens	% Lamp	% Luminaire
FL - Front-Low (0-30)	33.2	N.A.	16.6
FM - Front-Medium (30-60)	55.5	N.A.	27.8
FH - Front-High (60-80)	15.9	N.A.	7.9
FVH - Front-Very High (80-90)	0.4	N.A.	0.2
BL - Back-Low (0-30)	31.0	N.A.	15.5
BM - Back-Medium (30-60)	49.4	N.A.	24.7
BH - Back-High (60-80)	14.1	N.A.	7.1
BVH - Back-Very High (80-90)	0.4	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	199.9	N.A.	100.0
BUG Rating	B0-U0-G0		

IES ROAD REPORT
PHOTOMETRIC FILENAME : L111407208.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	94.02	94.02	94.02	94.02	94.02	94.02	94.02	94.02	94.02	94.02
5	91.84	91.91	91.98	91.89	91.86	91.82	91.84	92.08	92.20	92.34
10	83.22	83.40	84.10	85.15	85.97	86.73	87.39	87.93	88.27	88.37
15	81.51	81.58	81.03	80.10	80.62	82.32	83.52	83.60	82.74	82.64
20	80.41	80.31	80.15	81.30	80.79	78.21	77.72	78.25	77.41	77.37
25	76.39	77.24	78.09	77.36	76.89	76.81	75.81	75.38	75.37	74.04
30	74.88	74.76	74.39	73.34	73.55	74.75	73.05	72.24	72.69	71.97
35	64.18	65.48	65.53	64.01	63.65	64.16	62.31	61.98	62.55	61.84
40	52.99	54.91	56.01	55.12	54.74	56.10	56.47	56.68	56.59	56.20
45	52.51	52.46	52.20	52.77	51.31	52.53	53.45	53.66	53.68	53.56
50	44.31	44.62	44.00	44.19	44.68	44.15	43.33	43.23	43.81	44.07
55	36.52	36.28	36.16	36.41	36.38	36.09	36.07	36.16	35.98	35.83
60	30.61	30.61	30.32	30.37	30.29	29.93	30.22	30.01	29.67	29.86
65	29.41	29.38	29.57	29.51	29.07	29.58	30.24	30.97	31.37	30.10
70	22.41	21.66	21.74	21.86	22.12	22.51	22.33	22.29	12.73	2.04
75	1.51	1.49	1.49	1.49	1.49	1.51	1.54	1.53	1.48	1.44
80	1.10	1.12	1.12	1.13	1.15	1.15	1.17	1.17	1.20	1.20
85	0.86	0.86	0.86	0.89	0.89	0.91	0.93	0.93	0.96	0.96
90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

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	94.02	94.02	94.02	94.02	94.02	94.02	94.02	94.02	94.02	94.02
5	92.61	92.80	93.16	93.50	93.67	93.59	93.40	93.01	92.40	91.89
10	88.25	88.41	88.96	89.90	90.72	90.81	90.02	88.42	88.13	88.72
15	82.83	82.26	81.85	83.00	84.67	85.61	85.27	83.77	83.28	83.60
20	78.18	76.62	75.52	77.85	79.16	78.15	78.63	78.99	79.11	78.99
25	73.05	72.62	72.29	72.28	71.80	72.60	70.61	68.83	69.62	70.46
30	71.61	71.40	70.13	68.30	66.44	65.53	64.61	63.46	63.77	64.95
35	61.43	64.13	64.97	63.08	62.51	62.79	63.32	62.80	61.93	61.74
40	55.94	57.30	57.33	56.63	57.43	57.61	57.52	57.85	56.63	55.91
45	53.14	51.69	51.65	50.78	49.32	49.92	51.32	50.54	49.21	48.91
50	43.12	42.73	42.90	42.44	42.08	41.85	40.79	40.65	41.08	41.15
55	35.81	35.47	34.54	35.01	35.74	34.63	33.79	33.24	33.17	33.15
60	29.93	29.17	27.97	28.06	27.97	27.20	26.53	26.48	26.48	26.00
65	22.62	24.11	29.58	31.30	30.54	30.84	31.04	30.75	30.61	30.15
70	1.87	1.97	6.78	21.78	22.03	22.60	22.63	21.91	22.10	22.10
75	1.44	1.42	1.48	1.58	1.60	1.61	1.63	1.63	1.65	1.65
80	1.20	1.18	1.20	1.22	1.20	1.20	1.24	1.24	1.24	1.24
85	0.96	0.94	0.93	0.91	0.89	0.88	0.88	0.89	0.89	0.93
90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

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	94.02	94.02	94.02	94.02	94.02	94.02	94.02	94.02	94.02	94.02
5	91.44	91.07	90.86	90.79	90.69	90.72	90.79	91.03	91.31	91.46
10	89.06	89.04	88.25	86.95	86.23	85.49	85.11	85.35	85.16	84.53
15	84.84	84.31	83.31	83.14	83.79	83.29	81.70	79.59	78.04	77.42
20	77.87	77.36	77.58	77.68	76.79	75.76	74.61	74.04	74.37	74.73
25	71.33	71.04	71.20	71.50	71.38	71.54	71.59	72.71	73.68	72.11
30	64.92	64.30	65.05	64.35	65.24	65.55	66.97	68.71	68.14	67.11

IES ROAD REPORT
PHOTOMETRIC FILENAME : L111407208.IES

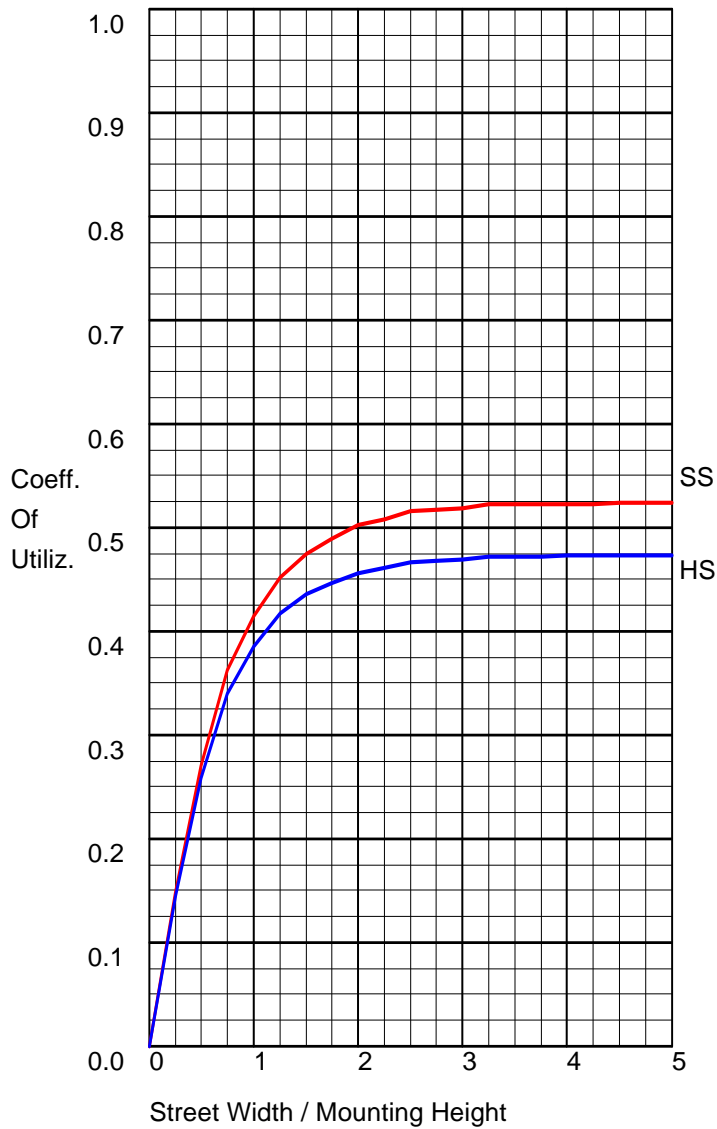
CANDELA TABULATION - (Cont.)

35	61.67	61.55	61.62	61.64	61.23	60.69	61.19	61.02	60.21	60.08
40	55.75	56.28	56.59	56.52	56.18	56.06	54.60	52.37	51.19	52.90
45	49.32	49.33	47.96	47.41	47.69	48.12	47.93	47.46	47.48	46.35
50	41.32	40.86	39.24	39.02	39.93	40.86	42.11	42.25	41.27	39.50
55	33.22	32.67	32.83	33.58	33.74	34.15	34.03	33.68	33.05	32.62
60	25.88	26.27	26.12	26.34	26.49	26.82	26.92	27.22	27.13	27.06
65	29.81	30.34	30.00	29.46	29.22	28.30	22.46	28.88	28.62	28.06
70	21.47	21.50	21.40	21.35	17.55	2.92	2.15	2.35	16.53	21.21
75	1.66	1.66	1.68	1.68	1.66	1.60	1.58	1.60	1.63	1.65
80	1.24	1.24	1.25	1.25	1.25	1.25	1.25	1.27	1.25	1.22
85	0.91	0.91	0.93	0.94	0.94	0.93	0.91	0.89	0.88	0.84
90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Vert. Horizontal Angles

	<u>150</u>	<u>155</u>	<u>160</u>	<u>165</u>	<u>170</u>	<u>175</u>	<u>180</u>
0	94.02	94.02	94.02	94.02	94.02	94.02	94.02
5	91.50	91.41	91.39	91.17	91.10	90.96	90.95
10	83.91	83.79	83.58	83.55	83.36	83.12	83.19
15	77.37	77.78	78.39	77.73	77.53	47.53	5.39
20	75.74	75.90	76.62	77.32	77.63	44.58	3.64
25	72.55	73.56	72.84	72.84	73.24	41.23	3.19
30	66.94	67.47	67.68	68.45	68.98	39.81	2.95
35	59.90	59.24	58.50	58.27	58.63	43.07	2.78
40	51.65	51.81	53.74	53.62	52.73	34.90	2.64
45	46.98	46.61	46.06	44.82	43.93	30.29	2.51
50	37.87	37.25	38.39	38.90	39.21	23.90	2.30
55	32.07	30.87	30.73	31.16	30.80	17.76	2.09
60	27.08	26.36	26.10	26.29	26.01	6.66	1.92
65	27.46	25.53	24.14	23.77	23.85	4.55	1.75
70	20.90	20.49	20.09	19.92	19.77	9.54	1.58
75	1.60	1.54	1.49	1.48	1.46	1.39	1.34
80	1.17	1.12	1.06	1.03	1.03	1.03	1.06
85	0.79	0.76	0.70	0.69	0.65	0.67	0.69
90	0.00	0.00	0.00	0.00	0.00	0.00	0.00

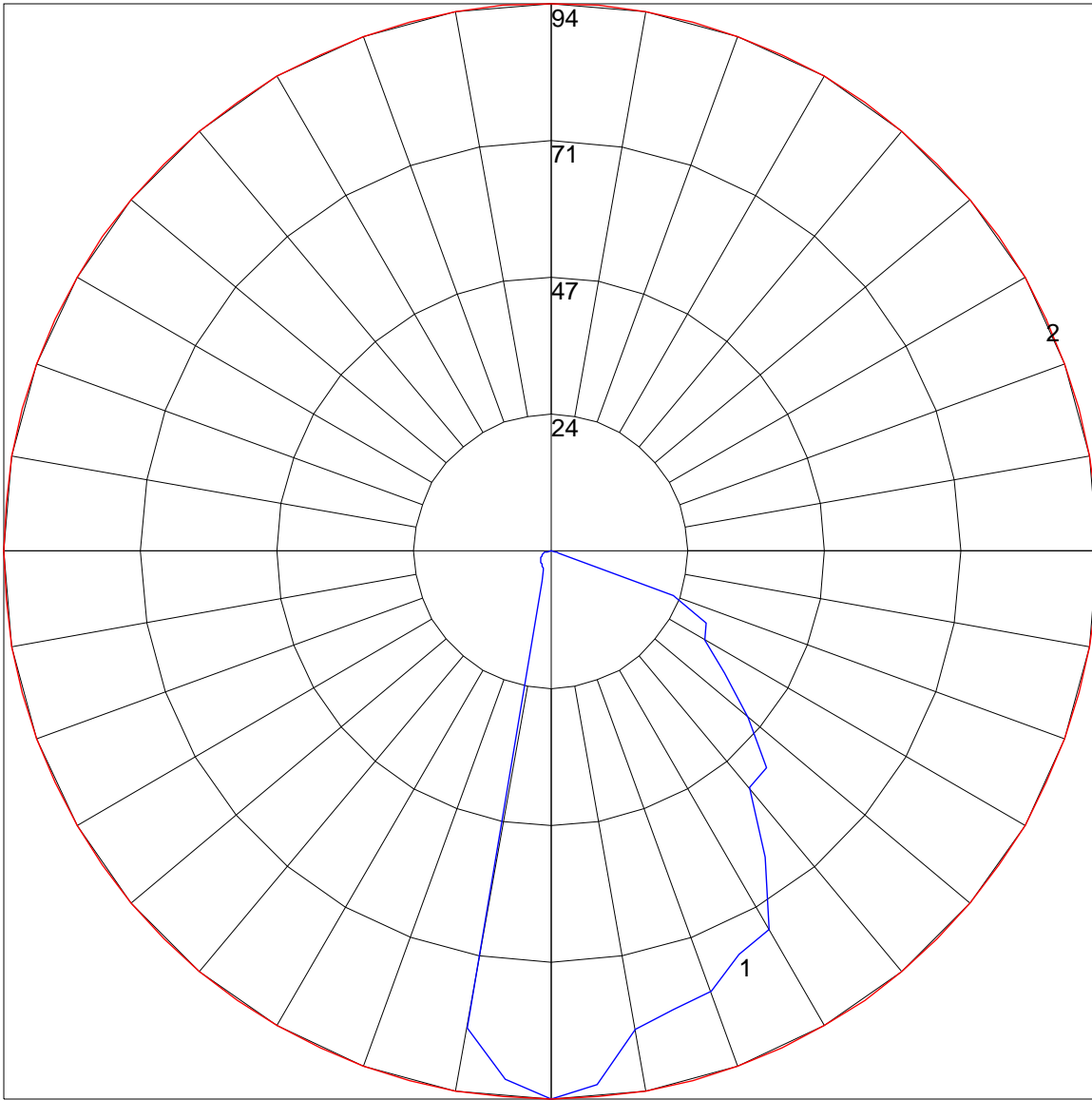
COEFFICIENTS OF UTILIZATION



FLUX DISTRIBUTION

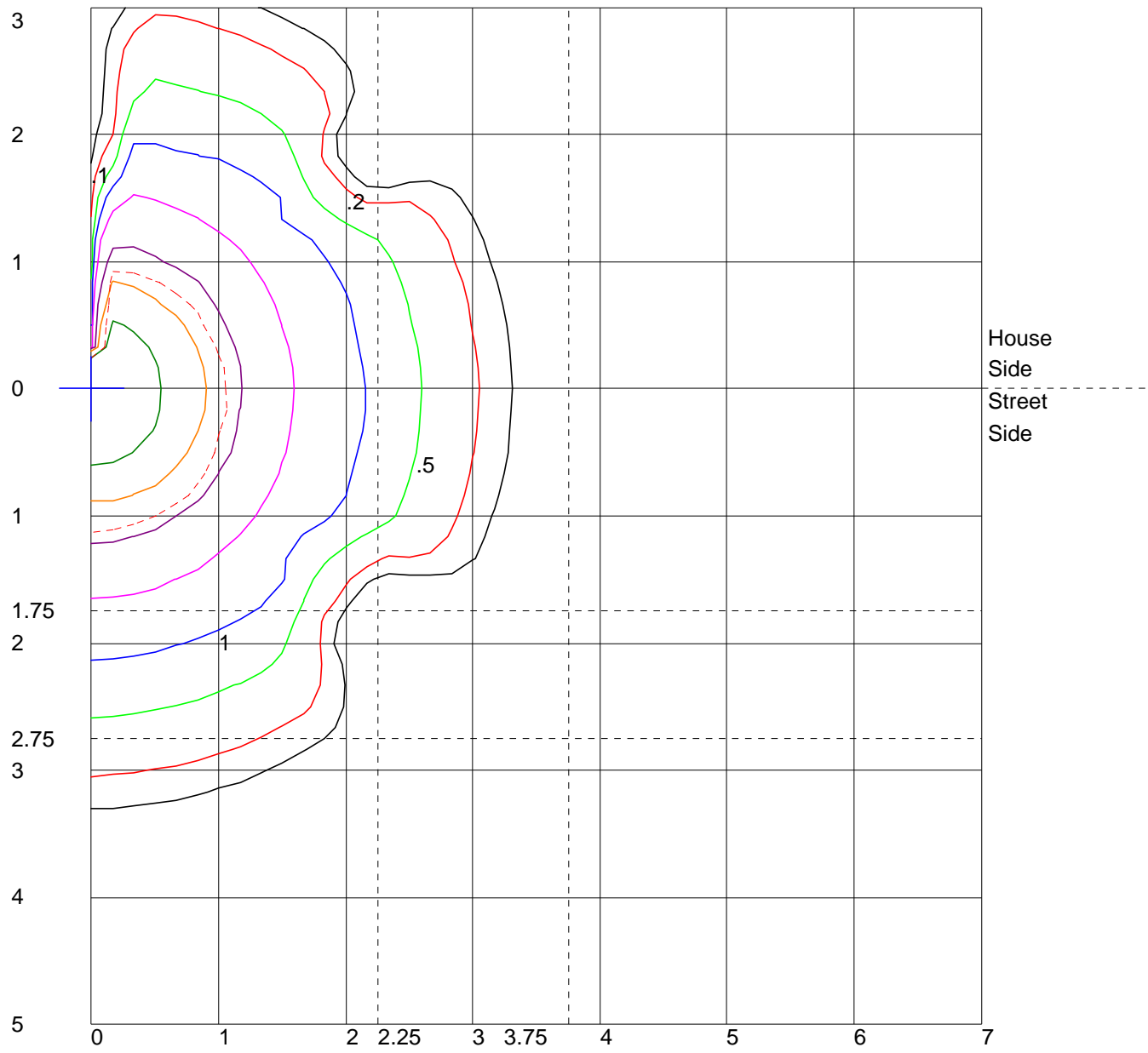
	Lumens	Percent Of Luminaire
Downward Street Side	105.0	52.5
Downward House Side	94.9	47.5
Downward Total	199.9	100.0
Upward Street Side	0.0	0.0
Upward House Side	0.0	0.0
Upward Total	0.0	0.0
Total Flux	199.9	100.0

POLAR GRAPH



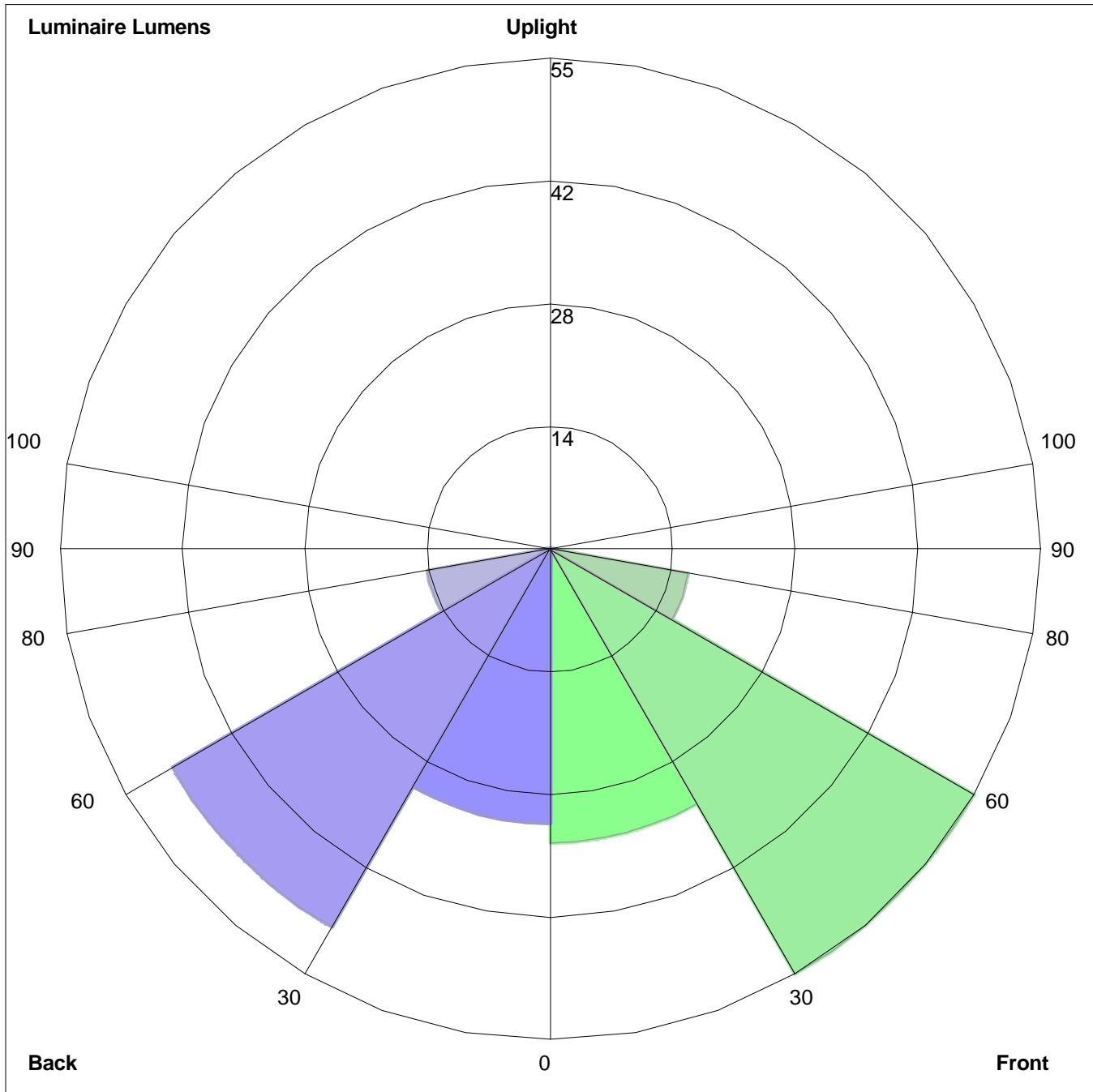
Maximum Candela = 94.02 Located At Horizontal Angle = 0, Vertical Angle = 0
1 - Vertical Plane Through Horizontal Angles (0 - 180) (Through Max. Cd.)
2 - Horizontal Cone Through Vertical Angle (0) (Through Max. Cd.)

ISOFOOTCANDLE LINES OF HORIZONTAL ILLUMINANCE



Distance In Units Of Mounting Height
 Values Based On 1.5 Foot Mounting Height
 1/2 Maximum Candela Trace Shown As Dashed Curve
 (+) = Maximum Candela Point

LUMINAIRE CLASSIFICATION SYSTEM (LCS) GRAPH



Luminaire Lumens:
 Front: Low=33.2, Medium=55.5, High=15.9, Very High=0.4
 Back: Low=31.0, Medium=49.4, High=14.1, Very High=0.4
 Uplight: Low=0.0, High=0.0

BUG Rating : B0-U0-G0