LIGHT LABORATORY INC.
8165 E Kaiser Blvd. Anaheim, CA 92808
p. 714.282.2270
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Report No: L111407203
Date: 12/11/2014

NVLAP LAB CODE 200927-0

Report No: **L111407203**

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

Model Number: **CCH2CB LED**

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 CCH2CB LED. 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: 12/9/14 - 12/9/14

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.

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Test Summary	
Manufacturer:	Cast Lighting
Model Number:	CCH2CB LED
Driver Model Number:	N/A
Total Lumens:	115.80
Input Voltage (VAC/60Hz):	12.00
Input Current (Amp):	0.39
Input Power (W):	4.23
Input Power Factor:	0.91
Current ATHD @ 12V(%):	44%
Current ATHD @ 24V(%):	N/A
Efficacy:	27
Color Rendering Index (CRI):	83
Correlated Color Temperature (K):	2804
Chromaticity Coordinate x:	0.4567
Chromaticity Coordinate y:	0.4182
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

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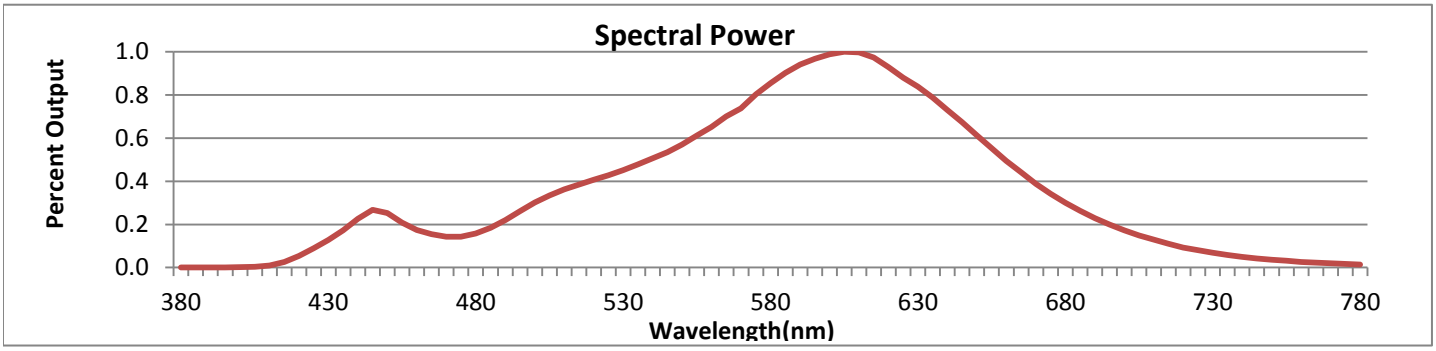


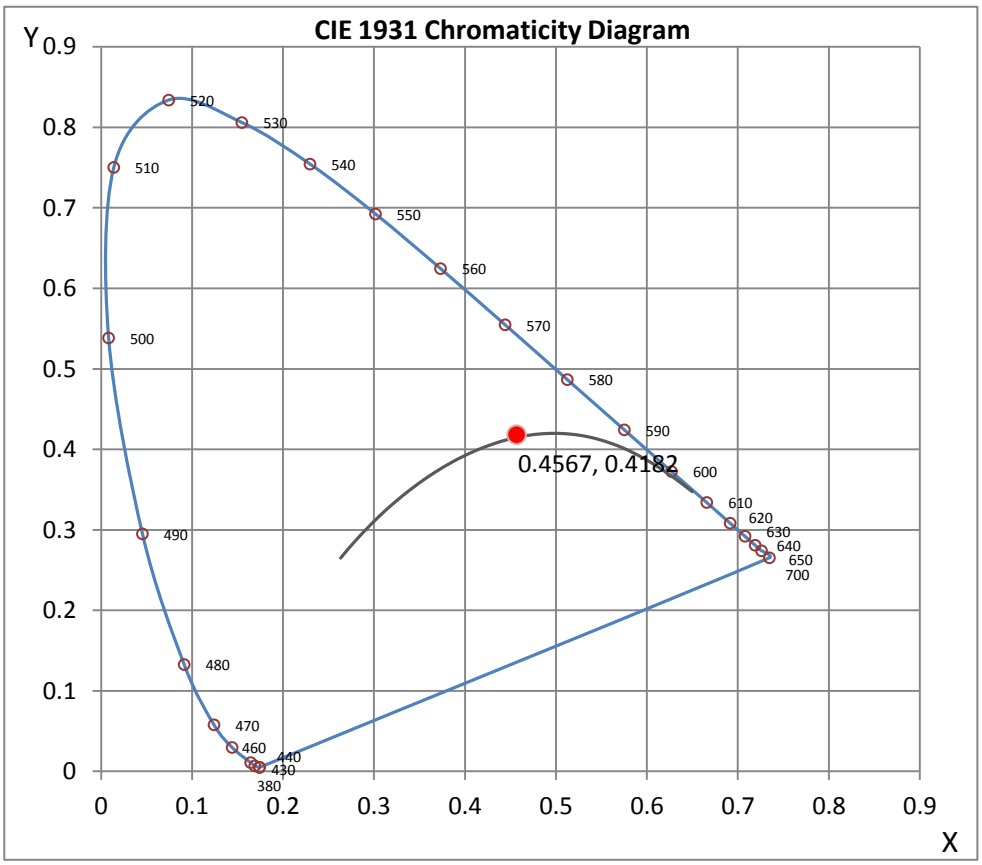
Wavelength	W/m²nm	440	0.2266	510	0.3628	580	0.8560	650	0.6130	720	0.0930
380	0.0007	450	0.2533	520	0.4068	590	0.9415	660	0.4950	730	0.0685
390	0.0009	460	0.1746	530	0.4522	600	0.9889	670	0.3882	740	0.0499
400	0.0018	470	0.1425	540	0.5058	610	0.9974	680	0.3006	750	0.0362
410	0.0101	480	0.1579	550	0.5705	620	0.9295	690	0.2293	760	0.0261
420	0.0533	490	0.2205	560	0.6520	630	0.8382	700	0.1732	770	0.0191
430	0.1288	500	0.3015	570	0.7387	640	0.7311	710	0.1293	780	0.0141

CRI & CCT

x	0.4567
y	0.4182
u'	0.2571
v'	0.5297
CRI	82.50
CCT	2804
Duv	0.00310

R Values

R1	80.00
R2	89.76
R3	97.76
R4	81.22
R5	80.27
R6	88.37
R7	83.76
R8	58.56
R9	6.71
R10	77.58
R11	80.66
R12	75.60
R13	81.95
R14	99.06



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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 : 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: 11*

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Photometric Test Report

IES ROAD REPORT
PHOTOMETRIC FILENAME : L111407203.IES

DESCRIPTIVE INFORMATION (From Photometric File)

IESNA:LM-63-2002
[TEST] L111407203
[TESTLAB] LIGHT LABORATORY, INC.
[ISSUEDATE] 12/11/2014
[MANUFAC] CAST LIGHTING
[LUMCAT] CCH2CB LED
[LUMINAIRE] 8-1/2"DIA X 24-1/2"H. LED LUMINAIRE
[MORE] CLEAR 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, 4.23W
[TEST PROCEDURE] IESNA:LM-79-08

CHARACTERISTICS

IES Classification	Type V
Longitudinal Classification	Very Short
Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Luminaire Lumens	116
Downward Total Efficiency	N.A. (absolute)
Total Luminaire Efficiency	N.A. (absolute)
Luminaire Efficacy Rating (LER)	27
Total Luminaire Watts	4.23
Ballast Factor	1.00
Upward Waste Light Ratio	0.00
Maximum Candela	39.48
Maximum Candela Angle	0H 5V
Maximum Candela (<90 Degrees Vertical)	39.48
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	2.49 (2.1% Luminaire Lumens)
Cutoff Classification (deprecated)	N.A. (absolute)

IES ROAD REPORT
PHOTOMETRIC FILENAME : L111407203.IES

LUMINAIRE CLASSIFICATION SYSTEM (LCS)

	Lumens	% Lamp	% Luminaire
FL - Front-Low (0-30)	12.8	N.A.	11.1
FM - Front-Medium (30-60)	31.9	N.A.	27.6
FH - Front-High (60-80)	12.6	N.A.	10.9
FVH - Front-Very High (80-90)	0.6	N.A.	0.5
BL - Back-Low (0-30)	12.8	N.A.	11.1
BM - Back-Medium (30-60)	31.9	N.A.	27.6
BH - Back-High (60-80)	12.6	N.A.	10.9
BVH - Back-Very High (80-90)	0.6	N.A.	0.5
UL - Uplight-Low (90-100)	0.0	N.A.	0.0
UH - Uplight-High (100-180)	0.0	N.A.	0.0
Total	115.8	N.A.	100.0
BUG Rating	B0-U0-G0		

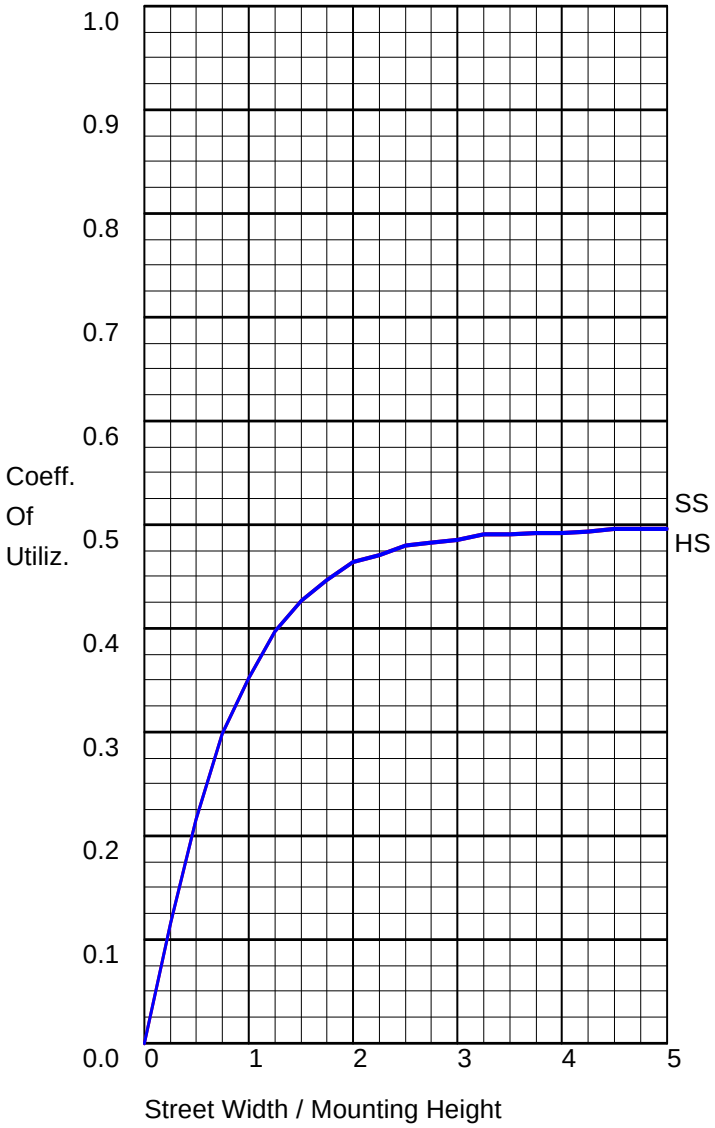
IES ROAD REPORT
PHOTOMETRIC FILENAME : L111407203.IES

CANDELA TABULATION

Vert. Angles	Horizontal Angles
	0
0	0.00
5	39.48
10	34.59
15	31.13
20	29.79
25	29.35
30	29.07
35	28.95
40	28.95
45	28.81
50	28.03
55	26.43
60	23.74
65	18.77
70	12.12
75	6.01
80	2.49
85	0.79
90	0.00

IES ROAD REPORT
PHOTOMETRIC FILENAME : L111407203.IES

COEFFICIENTS OF UTILIZATION

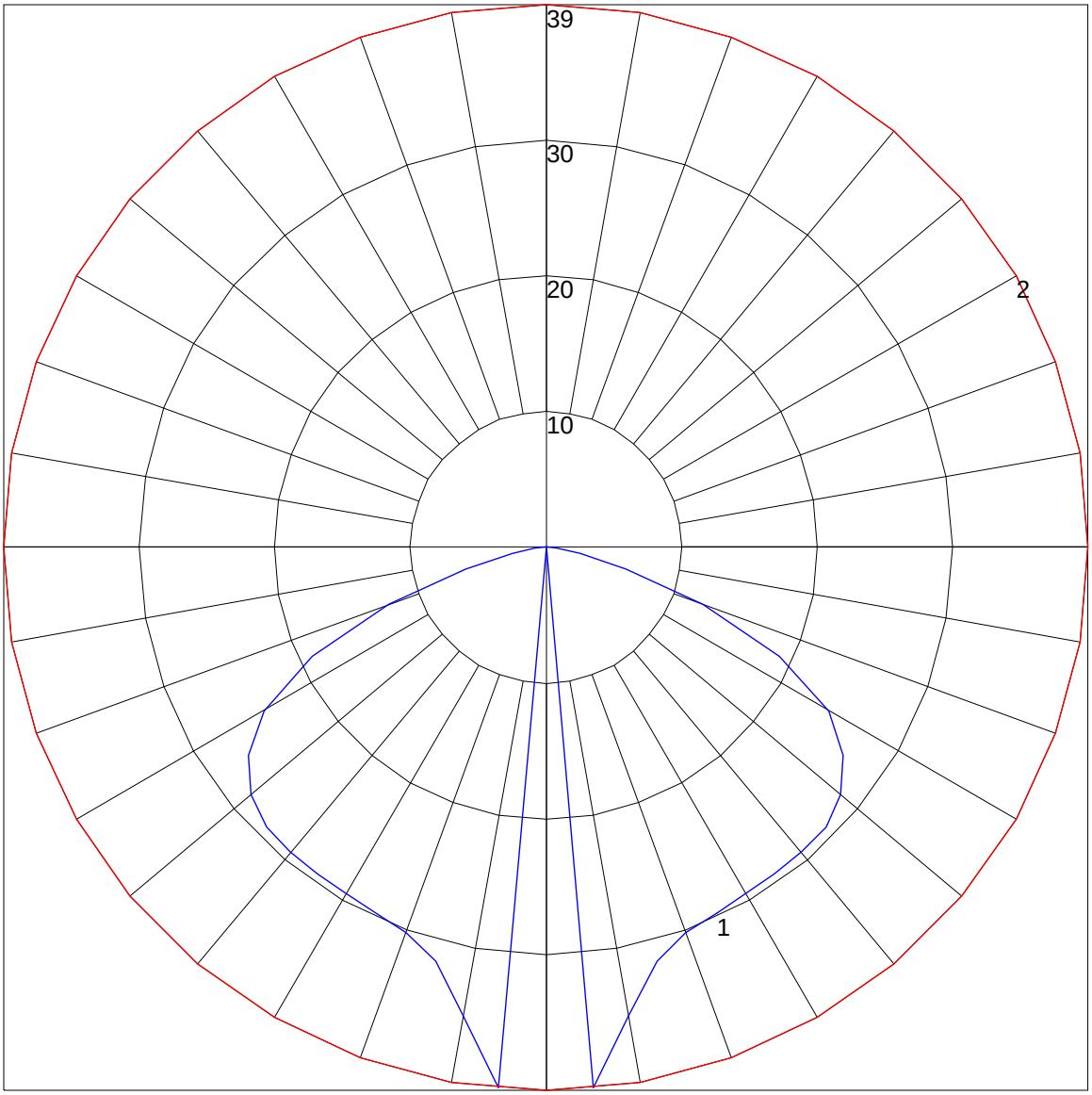


FLUX DISTRIBUTION

	Lumens	Percent Of Luminaire
Downward Street Side	57.9	50.0
Downward House Side	57.9	50.0
Downward Total	115.8	100.1
Upward Street Side	0.0	0.0
Upward House Side	0.0	0.0
Upward Total	0.0	0.0
Total Flux	115.8	100.1

IES ROAD REPORT
PHOTOMETRIC FILENAME : L111407203.IES

POLAR GRAPH



Maximum Candela = 39.48 Located At Horizontal Angle = 0, Vertical Angle = 5
1 - Vertical Plane Through Horizontal Angles (0 - 180) (Through Max. Cd.)
2 - Horizontal Cone Through Vertical Angle (5) (Through Max. Cd.)

IES ROAD REPORT
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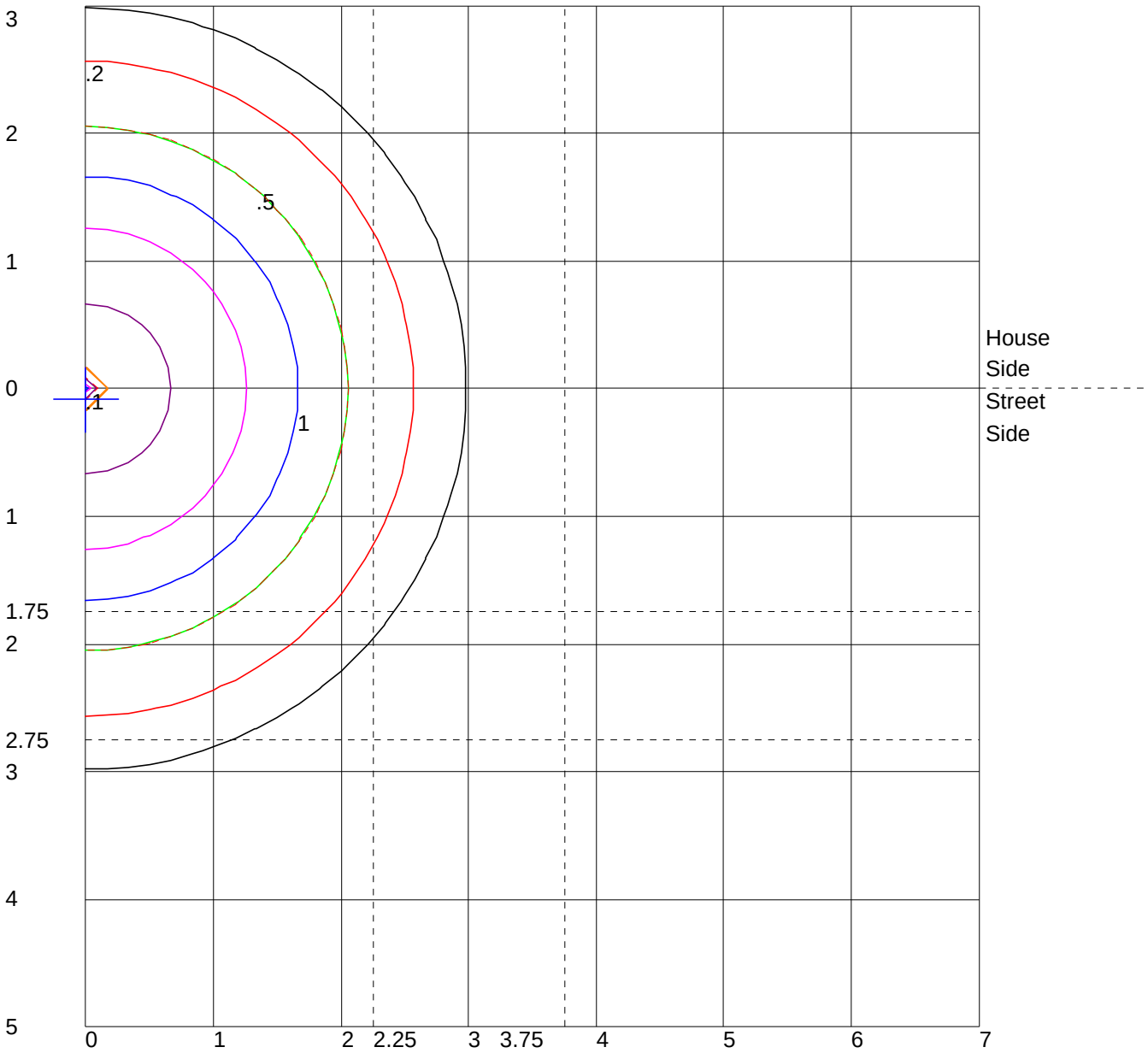
ISOFOOTCANDLE LINES OF HORIZONTAL ILLUMINANCE



Distance In Units Of Mounting Height
Values Based On 1.83 Foot Mounting Height
1/2 Maximum Candela Trace Shown As Dashed Curve
(+) = Maximum Candela Point

IES ROAD REPORT
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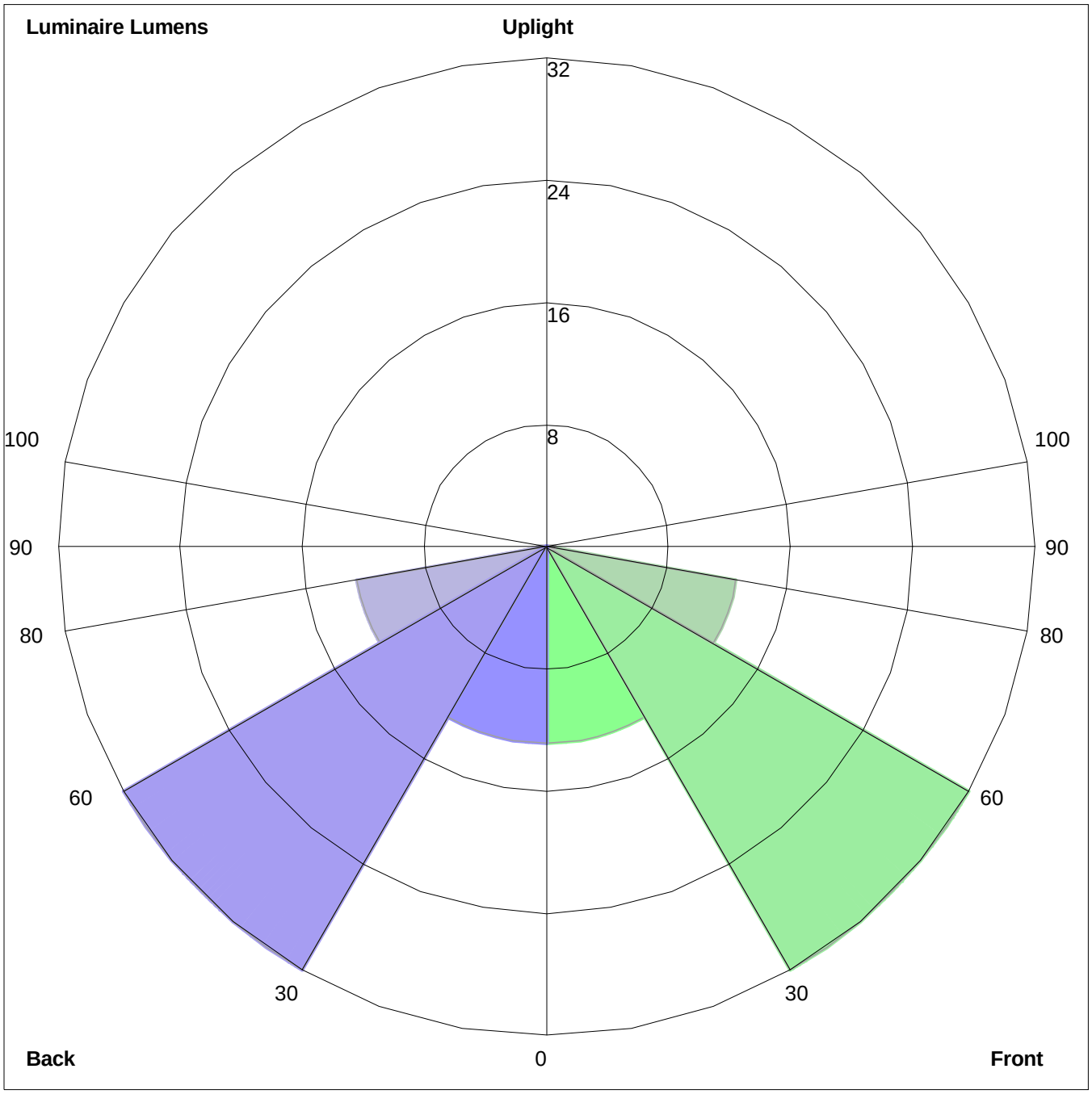
LUMINAIRE CLASSIFICATION SYSTEM (LCS) GRAPH



Luminaire Lumens:
Front: Low=12.8, Medium=31.9, High=12.6, Very High=0.6
Back: Low=12.8, Medium=31.9, High=12.6, Very High=0.6
Uplight: Low=0.0, High=0.0

BUG Rating : B0-U0-G0