



8165 E Kaiser Blvd. Anaheim, CA 92808  
 p. 714.282.2270  
 f. 714.676.5558

Report No: L031601201

Date: 3/14/2016



NVLAP LAB CODE 200927-0

**Report No:** L031601201

**Report Prepared For:** VIVA Railings  
 1454 Halsey Way

**Model Number:** 3000K LED Med/Clear

**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 3000K LED Med/Clear. Received in working and undamaged condition. No modifications were necessary.

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

**Sample Arrival Date:** 2/29/16

**Date of Tests:** 3/9/16 - 3/14/16

**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>	VIVA Railings
<b>Model Number:</b>	3000K LED Med/Clear
<b>Driver Model Number:</b>	N/A
<b>Total Lumens:</b>	619.60
<b>Input Voltage (VDC):</b>	12.00
<b>Input Current (Amp):</b>	0.81
<b>Input Power (W):</b>	9.84
<b>Input Power Factor:</b>	1.00
<b>Current ATHD @ 120V(%):</b>	N/A
<b>Current ATHD @ 277V(%):</b>	N/A
<b>Efficacy:</b>	63
<b>Color Rendering Index (CRI):</b>	91
<b>Correlated Color Temperature (K):</b>	2715
<b>Chromaticity Coordinate x:</b>	0.4533
<b>Chromaticity Coordinate y:</b>	0.4006
<b>Ambient Temperature (°C):</b>	25.0
<b>Stabilization Time (Hours):</b>	1:30
<b>Total Operating Time (Hours):</b>	2:20
<b>Off State Power(W):</b>	0.00

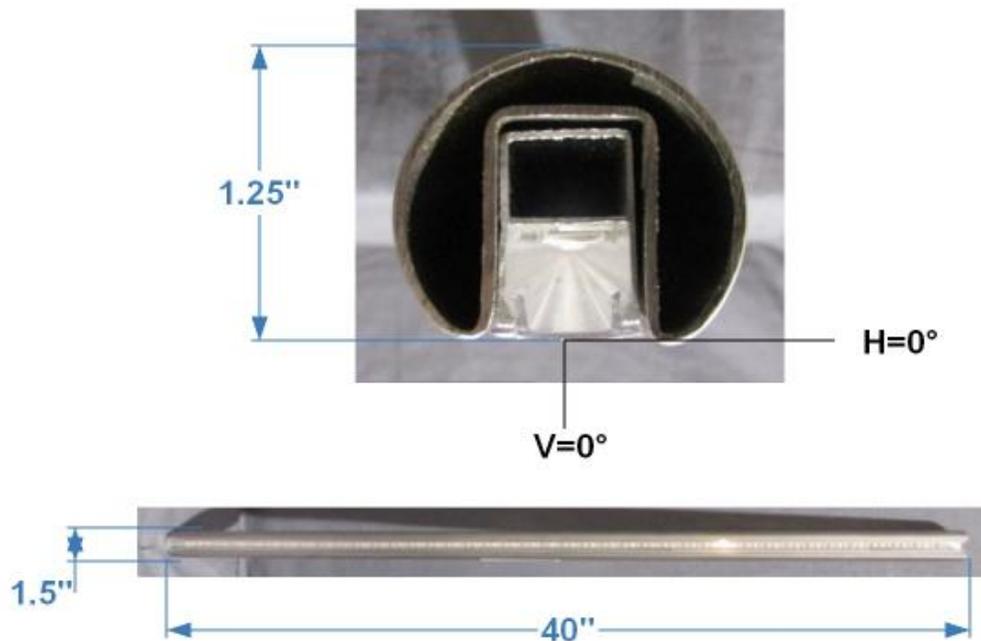
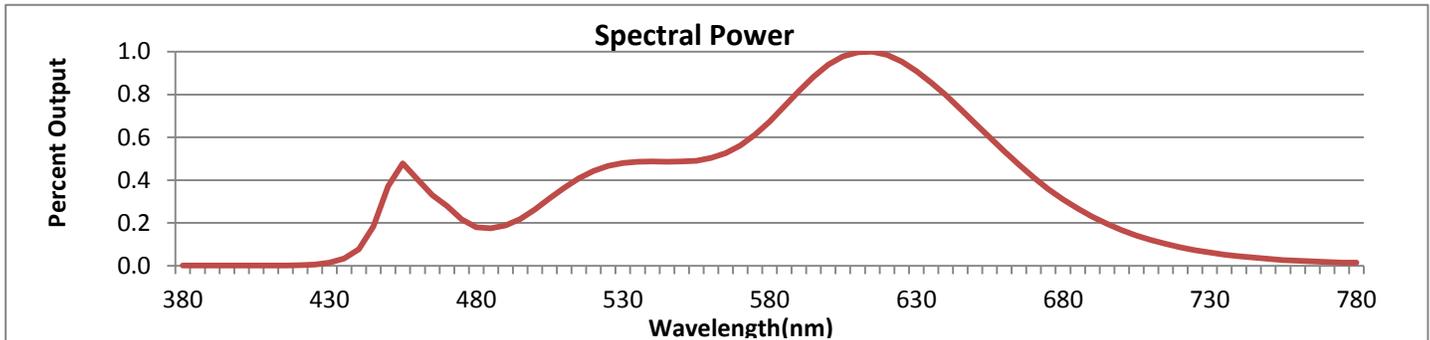


FIG. 1 LUMINAIRE

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



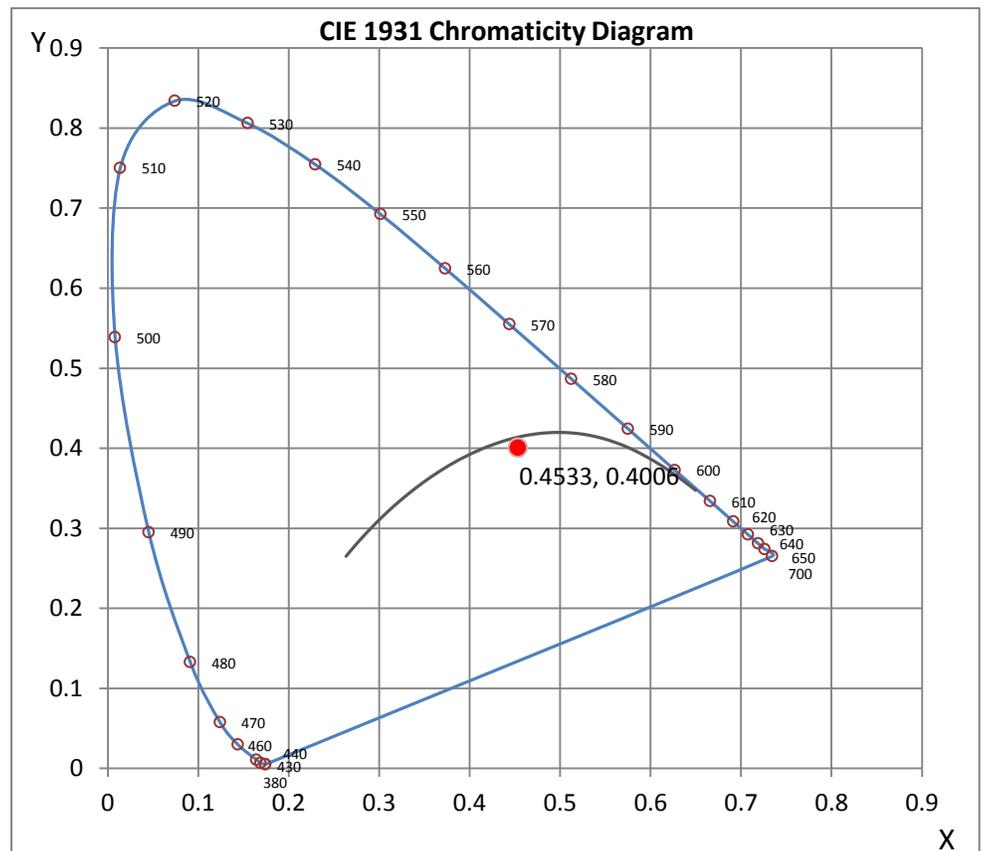
Wavelength	W/m <sup>2</sup> nm	440	0.0006	510	0.0030	580	0.0056	650	0.0055	720	0.0007
380	0.0000	450	0.0031	520	0.0037	590	0.0068	660	0.0044	730	0.0005
390	0.0000	460	0.0033	530	0.0040	600	0.0078	670	0.0034	740	0.0004
400	0.0000	470	0.0023	540	0.0040	610	0.0083	680	0.0026	750	0.0003
410	0.0000	480	0.0015	550	0.0040	620	0.0082	690	0.0019	760	0.0002
420	0.0000	490	0.0016	560	0.0042	630	0.0075	700	0.0014	770	0.0001
430	0.0001	500	0.0022	570	0.0047	640	0.0066	710	0.0010	780	0.0001

**CRI & CCT**

x	0.4533
y	0.4006
u'	0.2628
v'	0.5225
CRI	91.30
CCT	2715
Duv	-0.00319

**R Values**

R1	95.28
R2	98.81
R3	95.16
R4	94.68
R5	96.02
R6	93.04
R7	85.42
R8	72.38
R9	42.78
R10	98.61
R11	97.24
R12	82.81
R13	97.70
R14	98.70



\*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: 11*



8165 E. Kaiser Blvd. Anaheim, CA 92808  
 p. 714.282.2270  
 f. 714.676.5558

# Photometric Test Report

**IES ROAD REPORT**  
**PHOTOMETRIC FILENAME : L031601201.IES**

## DESCRIPTIVE INFORMATION (From Photometric File)

IESNA:LM-63-2002  
 [TEST] L031601201  
 [TESTLAB] LIGHT LABORATORY, INC.  
 [ISSUEDATE] 3/14/2016  
 [MANUFAC] VIVA RAILINGS  
 [LUMCAT] 3000K LED Med/Clear  
 [LUMINAIRE] 1.5"L. X 40"W. X 1.25"H. RAIL LIGHT  
 [MORE] 3000K LED Med Power Clear  
 [BALLASTCAT] 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.  
 [POWER SUPPLY] 12VDC CONSTANT VOLTAGE SOURCE  
 [INPUT] 12VDC, 9.84W  
 [TEST PROCEDURE] IESNA:LM-79-08

## CHARACTERISTICS

IES Classification	Type I
Longitudinal Classification	Very Short
Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Luminaire Lumens	620
Downward Total Efficiency	N.A. (absolute)
Total Luminaire Efficiency	N.A. (absolute)
Luminaire Efficacy Rating (LER)	63
Total Luminaire Watts	9.84
Ballast Factor	1.00
Upward Waste Light Ratio	0.00
Maximum Candela	308.43
Maximum Candela Angle	5H 5V
Maximum Candela (<90 Degrees Vertical)	308.43
Maximum Candela Angle (<90 Degrees Vertical)	5H 5V
Maximum Candela At 90 Degrees Vertical	0 (0.0% Luminaire Lumens)
Maximum Candela from 80 to <90 Degrees Vertical	31.55 (5.1% Luminaire Lumens)
Cutoff Classification (deprecated)	N.A. (absolute)

**IES ROAD REPORT**  
**PHOTOMETRIC FILENAME : L031601201.IES**

**LUMINAIRE CLASSIFICATION SYSTEM (LCS)**

	Lumens	% Lamp	% Luminaire
FL - Front-Low (0-30)	106.0	N.A.	17.1
FM - Front-Medium (30-60)	156.0	N.A.	25.2
FH - Front-High (60-80)	43.1	N.A.	7.0
FVH - Front-Very High (80-90)	4.7	N.A.	0.8
BL - Back-Low (0-30)	106.0	N.A.	17.1
BM - Back-Medium (30-60)	156.0	N.A.	25.2
BH - Back-High (60-80)	43.1	N.A.	7.0
BVH - Back-Very High (80-90)	4.7	N.A.	0.8
UL - Uplight-Low (90-100)	0.0	N.A.	0.0
UH - Uplight-High (100-180)	0.0	N.A.	0.0
Total	619.6	N.A.	100.0
BUG Rating	B0-U0-G0		

**ZONAL LUMEN SUMMARY**

Zone	%
0-20	17.1
0-30	34.2
0-40	53.2
0-60	84.6
0-80	98.5
0-90	100
10-90	95.3
20-40	36.1
20-50	53.5
40-70	40.6
60-80	13.9
70-80	4.7
80-90	1.5
90-110	0
90-120	0
90-130	0
90-150	0
90-180	0
110-180	0
0-180	100

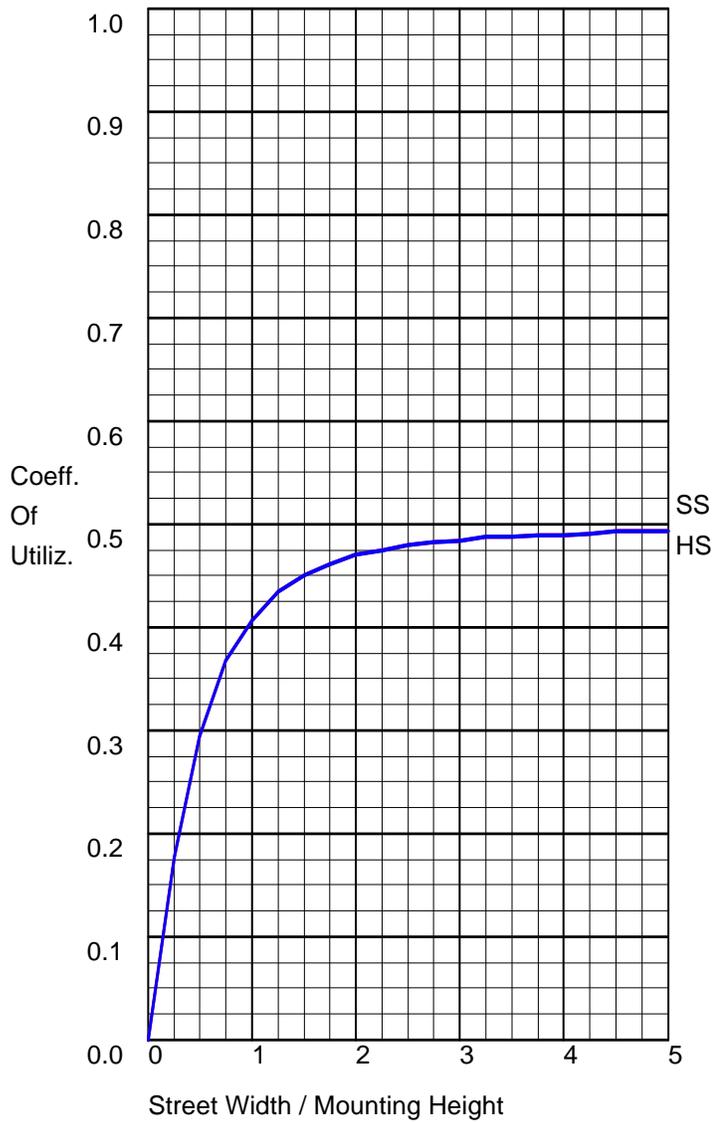
**IES ROAD REPORT**  
**PHOTOMETRIC FILENAME : L031601201.IES**

**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>
<b>0</b>	299.79	299.79	299.79	299.79	299.79	299.79	299.79	299.79	299.79	299.79
<b>5</b>	304.23	308.43	305.95	304.36	306.29	303.69	306.04	306.29	306.41	305.79
<b>10</b>	292.32	292.40	292.65	293.20	293.70	291.94	293.70	295.55	297.31	299.20
<b>15</b>	257.33	257.62	257.79	258.88	258.38	260.27	262.49	266.35	270.13	276.34
<b>20</b>	223.69	223.73	223.14	222.64	224.86	227.97	231.53	235.52	240.01	245.92
<b>25</b>	193.65	193.73	193.90	194.74	196.38	199.06	202.50	206.78	212.99	222.68
<b>30</b>	177.96	177.96	178.21	179.18	180.14	181.15	182.70	184.59	188.99	195.37
<b>35</b>	148.01	148.26	149.81	152.37	155.72	160.47	164.58	167.55	170.37	173.05
<b>40</b>	119.98	119.94	120.11	121.03	123.55	127.99	134.58	141.63	149.47	153.00
<b>45</b>	108.66	108.53	108.49	108.24	107.82	107.86	108.82	113.35	120.78	130.05
<b>50</b>	90.11	90.20	90.87	92.29	94.35	96.36	97.50	97.37	99.09	104.42
<b>55</b>	73.58	73.54	73.84	74.34	75.81	78.32	81.43	83.65	84.32	85.16
<b>60</b>	61.92	61.63	61.17	61.00	61.33	62.30	64.10	66.58	69.64	70.44
<b>65</b>	51.94	51.64	51.01	50.47	50.22	49.67	49.38	50.30	52.61	55.46
<b>70</b>	41.20	40.78	39.90	39.06	38.26	37.63	37.17	37.13	37.80	38.89
<b>75</b>	36.41	35.49	33.06	30.25	28.07	26.98	26.05	25.34	25.05	25.59
<b>80</b>	31.55	31.13	29.58	26.43	21.73	18.00	16.11	15.27	14.94	15.02
<b>85</b>	16.70	16.82	17.45	18.08	16.82	12.84	8.77	7.13	6.84	6.84
<b>90</b>	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>
<b>0</b>	299.79	299.79	299.79	299.79	299.79	299.79	299.79	299.79	299.79
<b>5</b>	304.99	305.16	304.74	304.65	304.53	304.53	304.61	304.65	307.17
<b>10</b>	300.75	301.76	302.51	303.14	303.31	303.06	302.64	302.26	304.82
<b>15</b>	280.87	284.94	288.88	291.94	293.28	295.51	293.49	292.03	292.23
<b>20</b>	249.19	255.28	262.37	268.95	275.20	278.35	279.10	278.35	277.55
<b>25</b>	230.31	238.16	246.21	256.11	265.89	274.87	277.89	278.01	279.31
<b>30</b>	204.26	215.30	225.95	236.23	248.02	259.97	268.62	269.54	268.57
<b>35</b>	177.96	186.77	200.11	213.49	226.20	242.19	255.65	258.63	256.91
<b>40</b>	155.35	159.00	167.68	183.66	198.35	214.16	231.74	239.25	236.77
<b>45</b>	135.80	137.56	140.20	150.06	167.81	184.29	204.60	216.51	213.37
<b>50</b>	111.47	116.71	117.38	119.98	133.70	153.59	175.06	193.48	189.62
<b>55</b>	89.57	94.31	95.57	97.33	103.16	122.25	141.29	164.37	160.34
<b>60</b>	70.81	73.46	76.81	76.10	77.61	87.64	106.81	128.79	127.78
<b>65</b>	56.80	57.47	58.73	57.22	55.29	58.40	72.83	91.16	92.21
<b>70</b>	40.69	42.96	42.87	40.40	36.50	34.74	38.34	49.96	52.94
<b>75</b>	26.39	26.98	26.85	25.34	21.86	19.09	18.04	22.53	25.76
<b>80</b>	15.27	14.94	14.35	13.22	11.12	9.40	8.47	9.02	10.82
<b>85</b>	6.75	6.34	5.58	4.87	3.99	3.36	3.06	2.98	3.19
<b>90</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

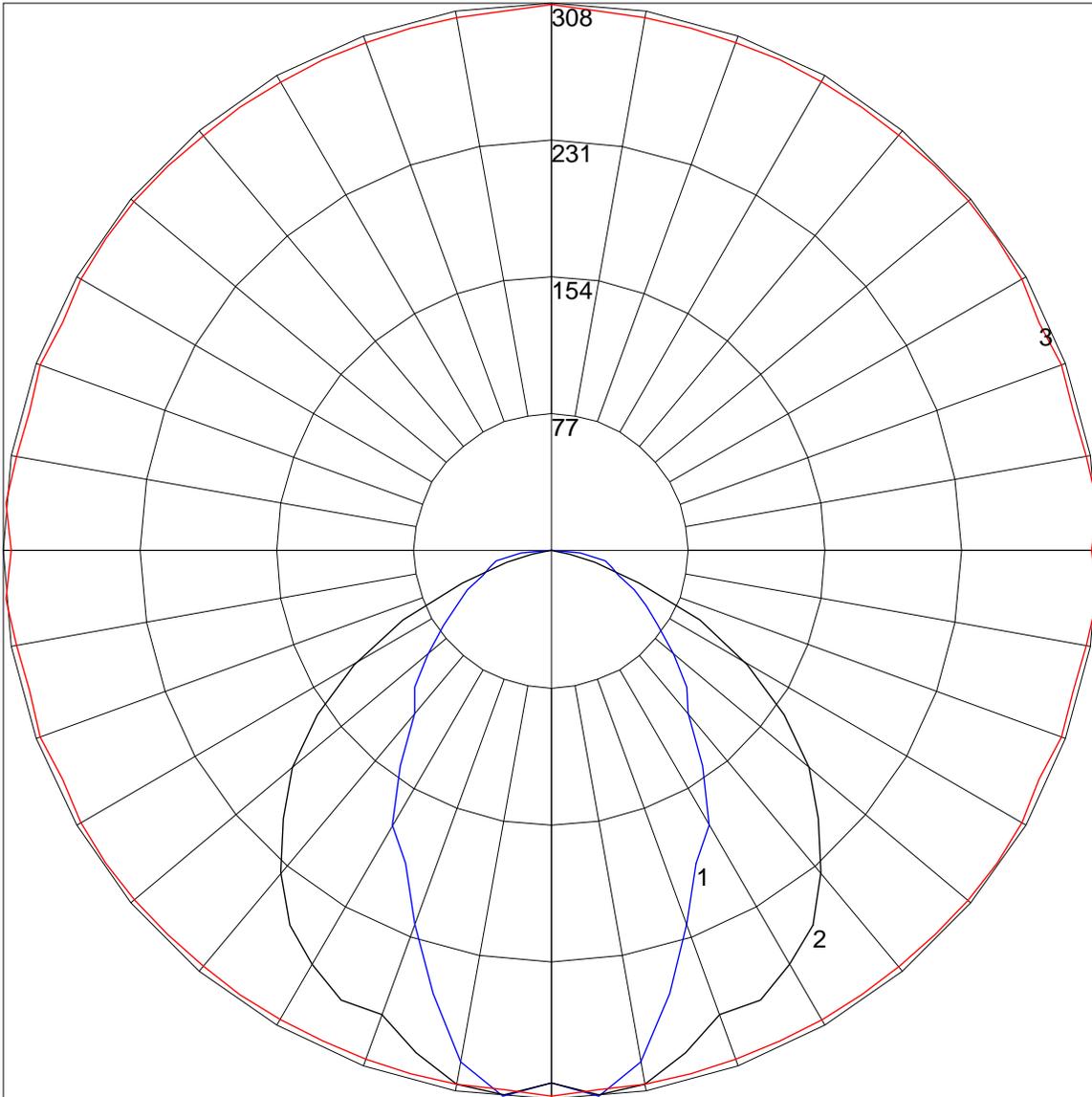
**COEFFICIENTS OF UTILIZATION**



**FLUX DISTRIBUTION**

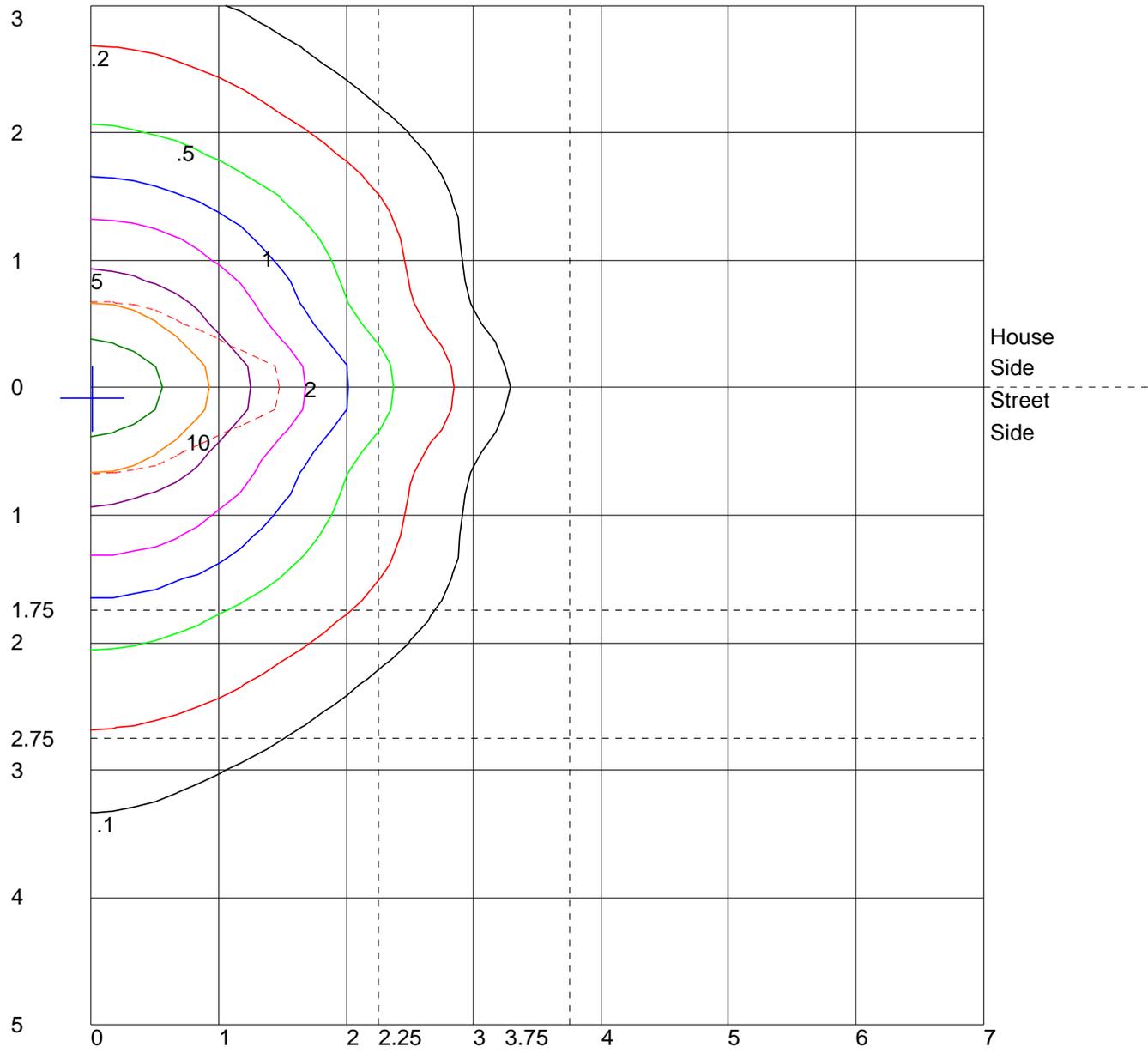
	Lumens	Percent Of Luminaire
Downward Street Side	309.8	50.0
Downward House Side	309.8	50.0
Downward Total	619.6	100.0
Upward Street Side	0.0	0.0
Upward House Side	0.0	0.0
Upward Total	0.0	0.0
Total Flux	619.6	100.0

POLAR GRAPH



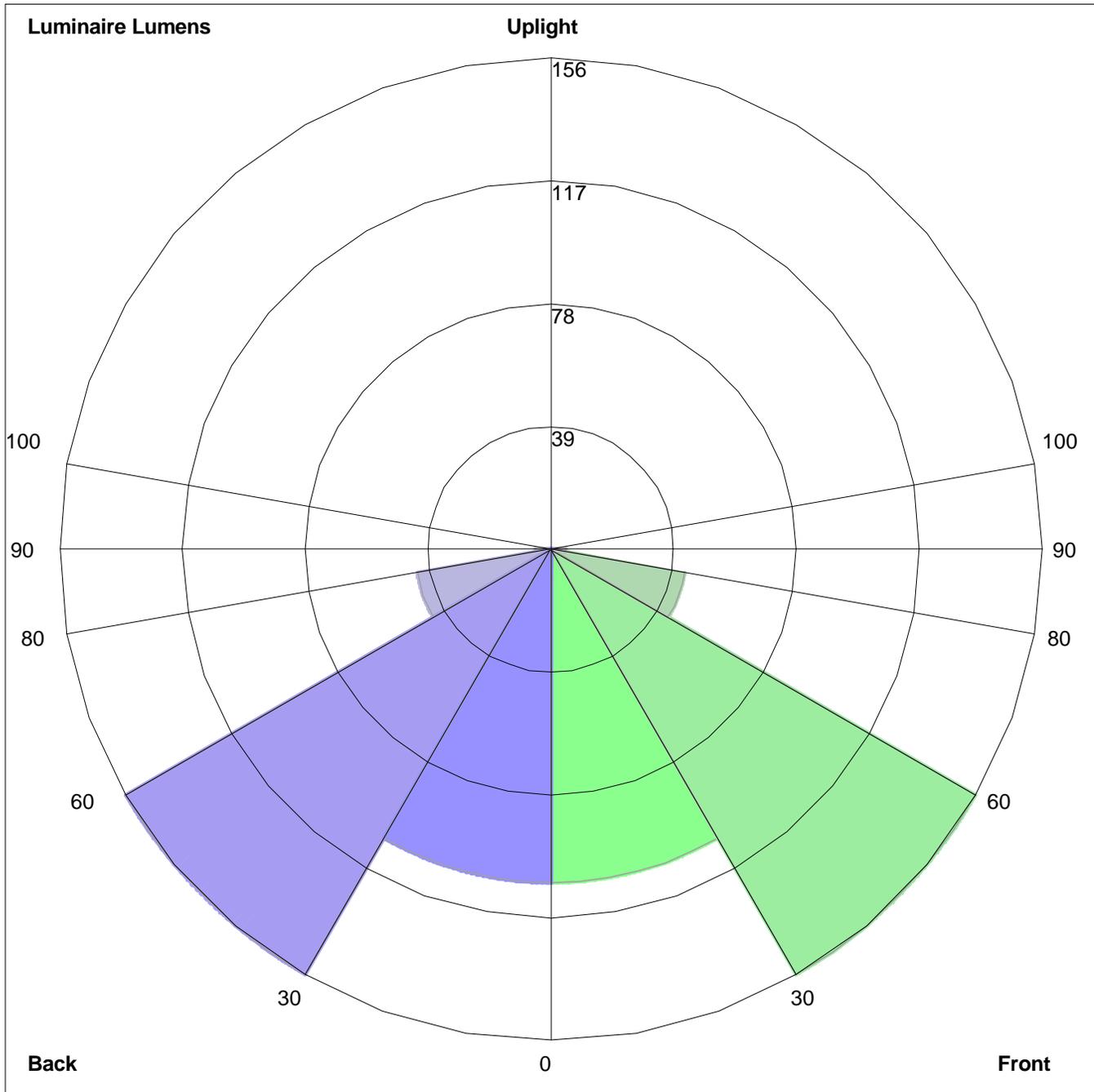
Maximum Candela = 308.43 Located At Horizontal Angle = 5, Vertical Angle = 5  
# 1 - Vertical Plane Through Horizontal Angles (5 - 185) (Through Max. Cd.)  
# 2 - Vertical Plane Through Horizontal Angles (90 - 270)  
# 3 - Horizontal Cone Through Vertical Angle (5) (Through Max. Cd.)

ISOFOOTCANDLE LINES OF HORIZONTAL ILLUMINANCE



Distance In Units Of Mounting Height  
 Values Based On 3 Foot Mounting Height  
 1/2 Maximum Candela Trace Shown As Dashed Curve  
 (+) = Maximum Candela Point

LUMINAIRE CLASSIFICATION SYSTEM (LCS) GRAPH



Luminaire Lumens:  
Front: Low=106.0, Medium=156.0, High=43.1, Very High=4.7  
Back: Low=106.0, Medium=156.0, High=43.1, Very High=4.7  
Uplight: Low=0.0, High=0.0

BUG Rating : B0-U0-G0