



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

Report No: L081607101

Date: 8/30/2016



NVLAP LAB CODE 200927-0

Report No: L081607101

Report Prepared For: REVOLUTION LIGHTING TECHNOLOGIES(RVLT)
 4139 Guardian St. Simi valley, CA 93063

Model Number: 281400-003-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 281400-003-M0X. Received in working and undamaged condition. No modifications were necessary.

Testing Condition: Fixture is tested with no special conditions.

Sample Arrival Date: 8/25/16

Date of Tests: 8/25/16 - 8/30/16

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:	REVOLUTION LIGHTING TECHNOLOGIES(RVLT)
Model Number:	281400-003-M0X
Driver Model Number:	CUSTOM DRIVER
Total Lumens:	1819.90
Input Voltage (VAC/60Hz):	120.00
Input Current (Amp):	0.14
Input Power (W):	16.05
Input Power Factor:	0.98
Current ATHD @ 120V(%):	12%
Current ATHD @ 277V(%):	N/A
Efficacy:	113
Color Rendering Index (CRI):	83
Correlated Color Temperature (K):	3868
Chromaticity Coordinate x:	0.3869
Chromaticity Coordinate y:	0.3820
Ambient Temperature (°C):	25.0
Stabilization Time (Hours):	0:30
Total Operating Time (Hours):	1:20
Off State Power(W):	0.00

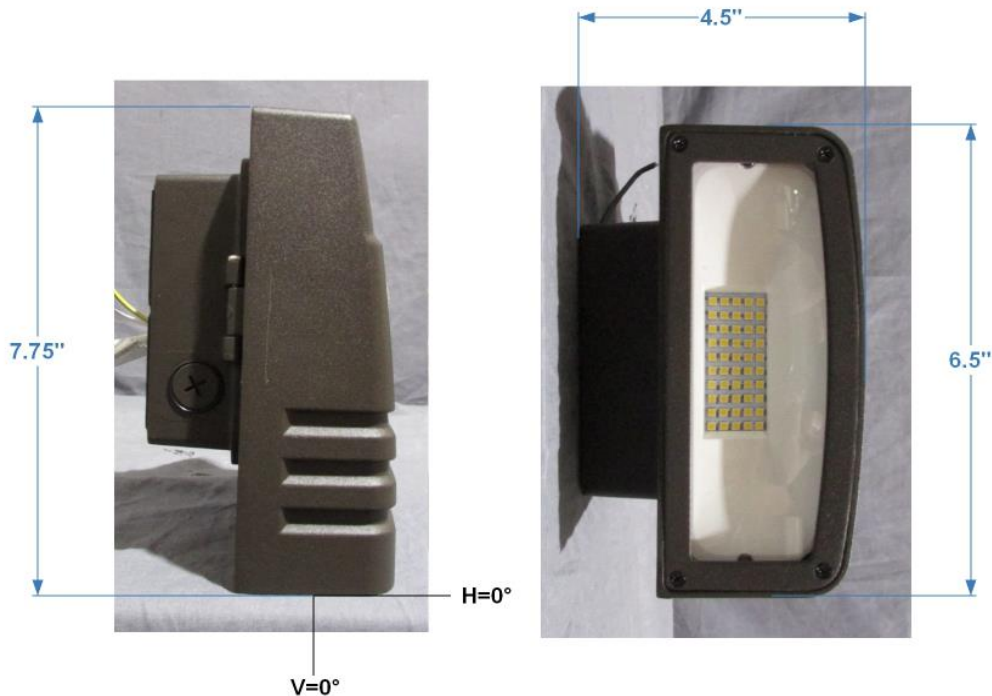
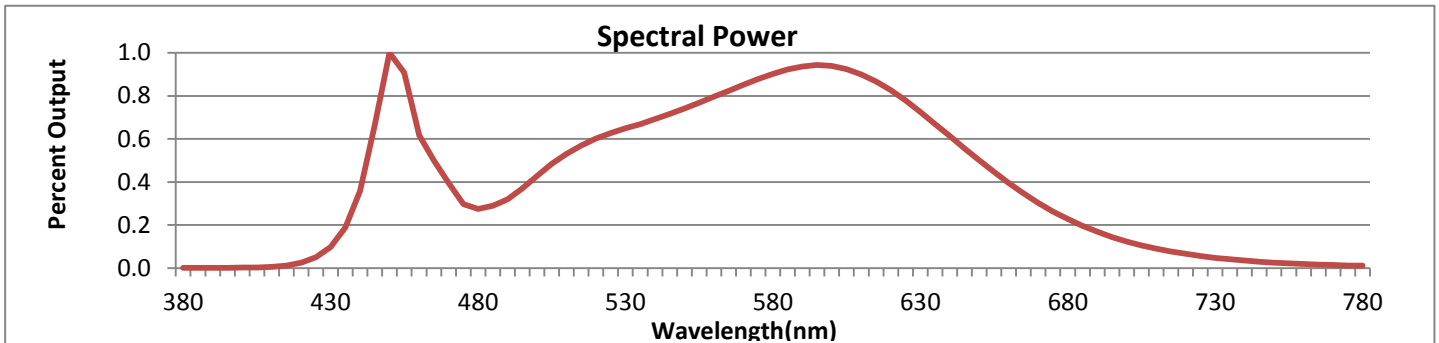


FIG. 1 LUMINAIRE

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



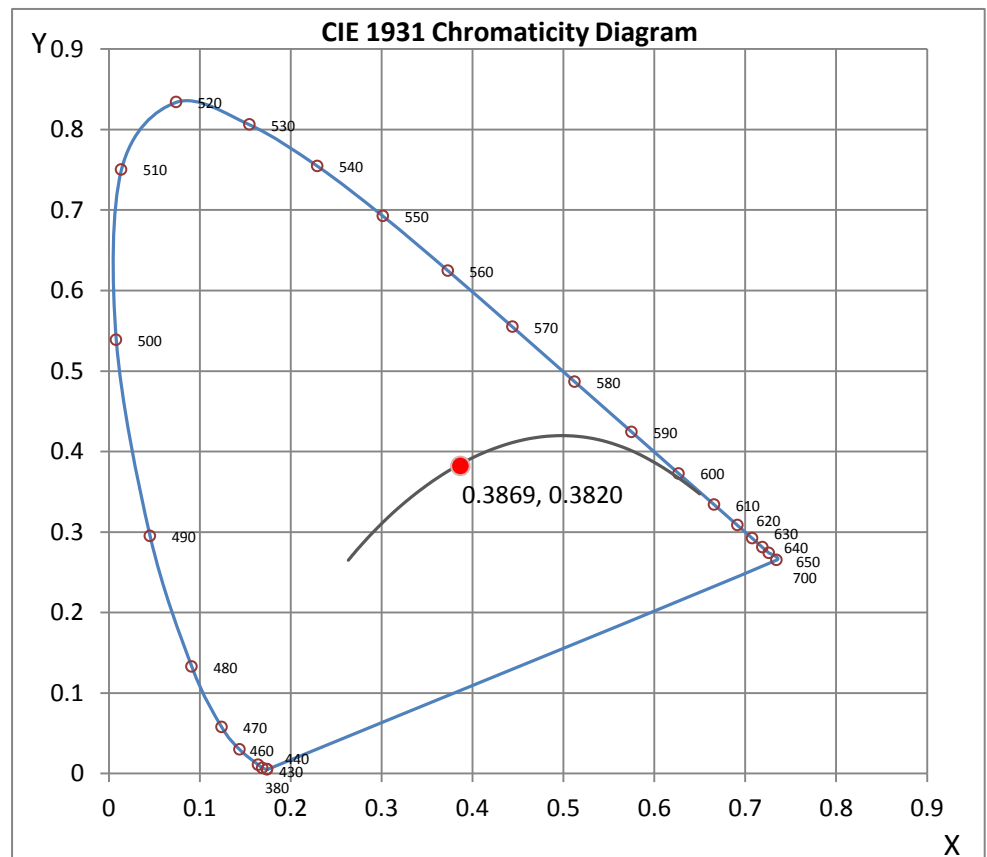
Wavelength	W/m ² nm	440	0.3575	510	0.5309	580	0.9016	650	0.5005	720	0.0659
380	0.0010	450	1.0000	520	0.6017	590	0.9368	660	0.3955	730	0.0478
390	0.0012	460	0.6169	530	0.6487	600	0.9396	670	0.3027	740	0.0348
400	0.0019	470	0.3945	540	0.6920	610	0.8990	680	0.2280	750	0.0255
410	0.0056	480	0.2743	550	0.7414	620	0.8257	690	0.1689	760	0.0188
420	0.0244	490	0.3193	560	0.7962	630	0.7254	700	0.1237	770	0.0138
430	0.0976	500	0.4281	570	0.8523	640	0.6136	710	0.0903	780	0.0119

CRI & CCT

x	0.3869
y	0.3820
u'	0.2272
v'	0.5048
CRI	83.20
CCT	3868
Duv	0.00061

R Values

R1	81.55
R2	89.87
R3	95.48
R4	81.54
R5	81.25
R6	85.50
R7	85.92
R8	64.45
R9	10.31
R10	75.62
R11	80.26
R12	61.26
R13	83.67
R14	97.48



*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 : L081607101.IES

DESCRIPTIVE INFORMATION (From Photometric File)

IESNA:LM-63-2002
 [TEST] L081607101
 [TESTLAB] LIGHT LABORATORY, INC.
 [ISSUEDATE] 8/30/2016
 [MANUFAC] REVOLUTION LIGHTING TECHNOLOGIES(RVLT)
 [LUMCAT] 281400-003-M0X
 [LUMINAIRE] 15W 4000K ARCHITECTURAL WALL PACK
 [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, 16.05W
 [_TEST PROCEDURE] IESNA:LM-79-08

CHARACTERISTICS

IES Classification	Type II
Longitudinal Classification	Very Short
Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Luminaire Lumens	1820
Downward Total Efficiency	N.A. (absolute)
Total Luminaire Efficiency	N.A. (absolute)
Luminaire Efficacy Rating (LER)	113
Total Luminaire Watts	16.05
Ballast Factor	1.00
Upward Waste Light Ratio	0.00
Maximum Candela	782.84
Maximum Candela Angle	10H 10V
Maximum Candela (<90 Degrees Vertical)	782.84
Maximum Candela Angle (<90 Degrees Vertical)	10H 10V
Maximum Candela At 90 Degrees Vertical	0 (0.0% Luminaire Lumens)
Maximum Candela from 80 to <90 Degrees Vertical	30.56 (1.7% Luminaire Lumens)
Cutoff Classification (deprecated)	N.A. (absolute)

IES ROAD REPORT
PHOTOMETRIC FILENAME : L081607101.IES

LUMINAIRE CLASSIFICATION SYSTEM (LCS)

ZONAL LUMEN SUMMARY

	Lumens	% Lamp	% Luminaire	Zone	%
FL - Front-Low (0-30)	311.7	N.A.	17.1		
FM - Front-Medium (30-60)	619.6	N.A.	34.0	0-20	15.4
FH - Front-High (60-80)	154.7	N.A.	8.5	0-30	32.5
FVH - Front-Very High (80-90)	4.1	N.A.	0.2	0-40	52.7
BL - Back-Low (0-30)	279.9	N.A.	15.4	0-60	87.8
BM - Back-Medium (30-60)	387.0	N.A.	21.3	0-80	99.6
BH - Back-High (60-80)	60.2	N.A.	3.3	0-90	100
BVH - Back-Very High (80-90)	2.7	N.A.	0.1	10-90	96
UL - Uplight-Low (90-100)	0.0	N.A.	0.0	20-40	37.3
UH - Uplight-High (100-180)	0.0	N.A.	0.0	20-50	57
				40-70	44.1
Total	1819.9	N.A.	100.0	60-80	11.8
				70-80	2.9
BUG Rating	B1-U0-G0			80-90	0.4
				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 : L081607101.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	774.09	774.09	774.09	774.09	774.09	774.09	774.09	774.09	774.09	774.09
5.0	779.88	780.23	779.88	779.53	779.18	778.49	778.14	777.45	776.75	775.71
10.0	782.66	782.66	782.84	781.79	780.75	779.18	778.14	776.23	774.14	771.53
15.0	780.92	780.75	779.88	779.53	777.79	775.53	773.27	769.97	767.18	763.18
20.0	771.53	771.36	770.84	769.44	767.71	764.23	760.92	757.97	754.49	750.83
25.0	755.88	755.53	755.18	753.79	751.01	747.36	744.40	740.75	736.57	731.88
30.0	735.01	734.83	734.14	731.35	727.88	724.40	720.92	717.27	712.57	706.83
35.0	707.53	707.70	707.35	704.05	701.09	697.27	692.40	686.66	680.92	675.35
37.5	686.66	686.48	687.00	685.44	683.00	680.39	676.57	670.83	664.74	658.13
40.0	660.57	660.39	661.09	660.57	659.35	658.65	656.74	653.44	647.18	640.04
42.5	633.09	632.91	632.74	631.00	630.48	630.65	629.96	629.26	626.13	620.22
45.0	600.39	600.39	599.87	600.74	601.09	599.87	599.17	599.69	599.00	596.39
47.5	562.47	563.17	564.21	566.82	567.69	567.00	569.60	569.26	568.91	568.56
50.0	522.96	524.38	525.25	525.25	523.60	525.45	530.14	532.82	532.32	532.02
52.5	465.35	468.87	475.55	479.41	483.53	488.07	489.83	494.56	497.27	497.44
55.0	421.07	420.72	419.49	417.65	419.54	432.71	444.03	452.17	454.78	457.61
57.5	365.49	367.94	375.00	382.83	385.77	384.65	385.59	397.12	409.23	413.85
60.0	283.12	283.57	285.59	291.78	307.73	329.95	346.56	349.43	355.82	365.16
62.5	255.81	256.68	257.62	256.52	255.58	256.28	269.32	293.95	308.28	313.40
65.0	170.55	171.73	175.80	185.30	199.96	217.32	224.87	225.55	238.83	259.43
67.5	141.61	143.12	144.86	146.05	146.22	147.12	157.28	176.29	186.71	192.76
70.0	83.73	83.88	83.81	86.30	94.77	108.58	118.11	121.63	128.79	143.54
72.5	50.86	52.00	55.55	61.52	66.53	69.59	70.27	78.16	88.60	96.84
75.0	33.50	33.53	33.59	33.67	33.57	34.70	39.95	47.57	52.47	60.02
77.5	23.03	23.05	23.29	23.62	24.16	24.77	25.43	25.88	26.61	31.95
80.0	13.32	13.38	13.55	13.81	14.23	14.75	15.39	16.11	16.92	17.72
85.0	4.45	4.45	4.45	4.47	4.51	4.52	4.57	4.71	4.96	5.25
90.0	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>
0.0	774.09	774.09	774.09	774.09	774.09	774.09	774.09	774.09	774.09	774.09
5.0	774.49	772.92	771.36	770.49	769.10	768.23	767.01	765.79	764.05	762.84
10.0	768.92	765.97	763.88	761.10	759.18	756.57	754.14	751.18	748.75	746.14
15.0	759.53	755.70	751.36	747.70	743.36	740.23	736.75	732.75	728.92	725.44
20.0	745.96	741.09	735.88	729.79	724.57	719.18	714.66	709.61	705.09	700.57
25.0	726.66	719.88	714.14	707.18	700.05	693.61	687.70	680.92	675.35	669.61
30.0	701.27	694.48	687.53	679.87	672.39	663.52	655.87	648.57	640.91	633.61
35.0	668.74	662.48	654.48	646.31	637.09	626.30	615.69	606.48	597.61	589.08
37.5	650.83	643.70	636.22	627.00	616.04	606.13	594.13	583.17	574.13	565.26
40.0	632.57	623.87	615.69	605.96	595.17	583.17	571.17	559.86	548.56	538.99
42.5	611.00	601.78	592.74	581.95	571.52	558.30	545.26	532.91	520.91	510.99
45.0	588.74	577.95	566.82	555.52	544.39	532.21	517.60	502.82	490.99	480.90
47.5	564.04	553.43	540.91	528.91	517.25	503.17	488.21	473.95	461.08	450.12
50.0	529.93	521.41	509.13	495.41	482.97	469.20	453.39	438.13	424.92	417.07
52.5	495.58	490.40	480.02	465.16	451.74	438.20	422.26	405.49	392.69	382.83
55.0	457.08	454.00	445.87	431.63	417.82	403.68	387.45	371.26	359.14	349.66
57.5	415.49	414.52	409.37	399.12	383.30	368.91	353.43	337.61	324.84	315.07
60.0	371.24	372.95	370.79	364.84	350.25	335.76	320.91	303.86	290.21	280.92
62.5	320.74	327.92	330.49	327.47	317.69	303.29	287.81	268.61	254.97	245.29
65.0	268.77	276.73	284.98	287.24	283.15	268.19	252.10	232.96	218.45	209.60
67.5	210.54	225.86	233.20	241.90	242.09	230.80	215.01	198.07	182.60	172.99

IES ROAD REPORT
PHOTOMETRIC FILENAME : L081607101.IES

CANDELA TABULATION - (Cont.)

70.0	156.06	170.33	186.41	194.19	198.68	194.08	179.07	162.39	146.83	137.33
72.5	108.88	120.98	136.08	147.47	152.93	153.40	142.22	127.63	113.35	104.74
75.0	68.60	80.56	87.24	99.83	107.82	109.19	102.55	91.57	79.66	71.12
77.5	36.46	44.98	49.27	57.01	63.69	64.09	61.29	53.34	45.95	40.00
80.0	18.25	21.17	23.62	27.46	30.52	30.56	28.25	24.32	20.75	18.33
85.0	5.58	5.88	6.11	6.19	6.07	5.71	5.27	4.91	4.59	4.44
90.0	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>
0.0	774.09	774.09	774.09	774.09	774.09	774.09	774.09	774.09	774.09	774.09
5.0	762.31	760.92	760.92	760.57	760.40	759.88	759.53	759.01	758.49	758.49
10.0	744.23	742.31	741.09	739.88	739.18	738.14	737.44	736.22	735.53	735.36
15.0	722.83	720.40	717.96	716.22	714.83	712.74	710.66	708.92	707.88	706.48
20.0	696.05	693.27	690.13	687.70	684.74	682.13	679.18	676.39	673.79	670.48
25.0	664.92	660.74	657.09	653.09	649.44	645.61	639.52	631.35	621.09	611.35
30.0	628.04	623.17	618.48	613.96	608.04	597.26	583.69	569.26	556.04	540.73
35.0	582.30	576.56	570.13	561.95	547.69	532.04	514.82	494.64	482.47	477.60
37.5	557.43	550.82	543.69	532.04	515.17	496.38	475.69	462.12	458.64	452.38
40.0	531.17	524.56	515.17	499.86	480.56	458.12	441.77	436.55	427.51	404.03
42.5	502.30	494.47	483.51	464.73	441.77	422.46	413.77	402.46	374.81	349.42
45.0	471.68	462.81	447.51	427.33	404.03	389.94	379.33	350.98	325.41	319.50
47.5	441.07	431.51	412.72	388.55	368.37	358.46	331.50	304.20	298.63	282.28
50.0	408.01	395.82	375.16	349.71	334.84	314.75	283.39	273.24	250.84	222.24
52.5	374.34	359.90	335.45	314.02	299.53	265.01	250.30	227.58	199.58	192.17
55.0	340.63	322.53	296.51	281.53	254.47	230.02	207.28	181.77	166.39	138.62
57.5	305.64	285.24	262.61	243.08	214.71	192.99	165.47	144.85	122.86	101.59
60.0	269.34	247.63	228.24	202.81	180.13	154.19	131.09	108.74	83.88	78.35
62.5	233.60	211.65	191.68	166.08	142.65	118.70	95.69	74.28	68.28	59.54
65.0	197.09	176.31	153.82	130.98	107.49	84.39	65.17	58.35	48.33	40.37
67.5	158.24	139.70	118.72	97.28	75.34	57.55	48.77	38.54	32.07	30.99
70.0	123.50	105.61	86.22	68.01	51.00	40.79	31.20	27.17	26.30	25.62
72.5	92.09	76.67	59.38	44.23	34.32	25.22	22.68	21.92	21.32	20.82
75.0	60.75	47.29	35.26	26.47	19.43	18.11	17.11	16.58	16.16	15.83
77.5	32.40	24.21	18.18	14.09	13.41	13.01	12.71	12.40	12.12	11.90
80.0	13.65	10.96	9.72	9.60	9.48	9.31	9.18	9.03	8.87	8.73
85.0	4.45	4.56	4.66	4.75	4.84	4.92	4.94	4.92	4.92	4.91
90.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Vert. Angles **Horizontal Angles**

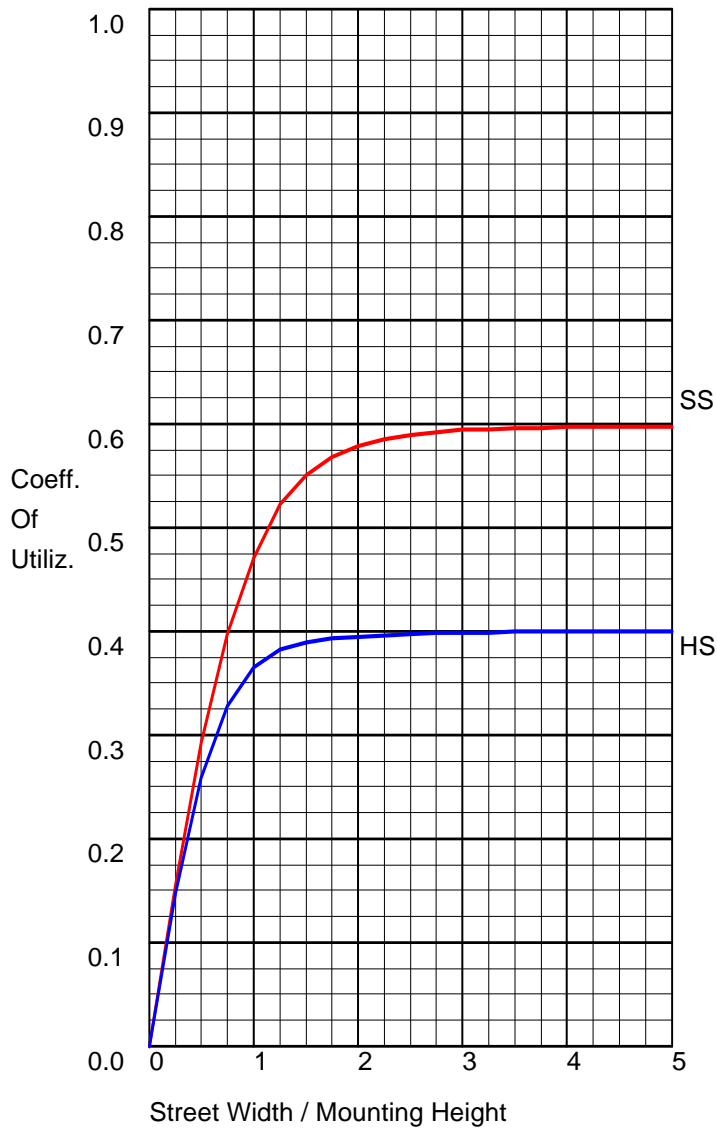
	<u>150</u>	<u>155</u>	<u>160</u>	<u>165</u>	<u>170</u>	<u>175</u>	<u>180</u>
0.0	774.09	774.09	774.09	774.09	774.09	774.09	774.09
5.0	758.31	757.97	757.62	757.44	757.44	757.44	757.27
10.0	735.18	734.83	734.14	734.14	733.44	733.79	733.62
15.0	705.27	704.22	703.70	703.18	703.35	703.35	703.35
20.0	666.31	661.26	657.61	654.65	652.57	651.52	650.48
25.0	603.00	595.69	589.08	584.39	581.08	578.82	578.13
30.0	526.30	518.47	515.86	513.95	513.43	513.60	513.43
35.0	474.12	468.03	457.77	443.68	433.25	428.03	426.46
37.5	436.20	414.99	395.85	383.68	377.59	376.03	376.03
40.0	377.94	362.29	357.94	356.37	355.16	354.63	354.46
42.5	341.07	337.59	333.94	322.46	309.07	300.37	297.76
45.0	313.94	290.80	265.24	253.58	250.80	250.45	250.10
47.5	249.76	237.06	235.32	232.71	224.71	215.67	212.19

IES ROAD REPORT
PHOTOMETRIC FILENAME : L081607101.IES

CANDELA TABULATION - (Cont.)

50.0	217.01	205.25	180.07	162.38	159.56	159.07	158.79
52.5	163.09	148.69	146.32	131.80	114.65	105.63	103.56
55.0	130.27	103.89	94.18	94.09	93.19	91.92	91.38
57.5	86.96	84.91	80.06	76.14	72.79	70.54	69.81
60.0	71.97	64.98	59.47	55.01	52.00	50.30	49.71
62.5	51.73	45.62	41.10	40.21	39.85	39.66	39.59
65.0	36.12	35.34	34.80	34.42	34.14	33.97	33.95
67.5	30.28	29.74	29.32	29.01	28.77	28.68	28.63
70.0	25.12	24.66	24.30	24.07	23.92	23.79	23.76
72.5	20.38	20.07	19.79	19.62	19.45	19.38	19.31
75.0	15.51	15.25	15.08	14.91	14.80	14.73	14.71
77.5	11.69	11.51	11.38	11.29	11.20	11.15	11.17
80.0	8.64	8.54	8.45	8.40	8.37	8.35	8.35
85.0	4.92	4.96	4.99	5.01	5.03	5.03	5.01
90.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00

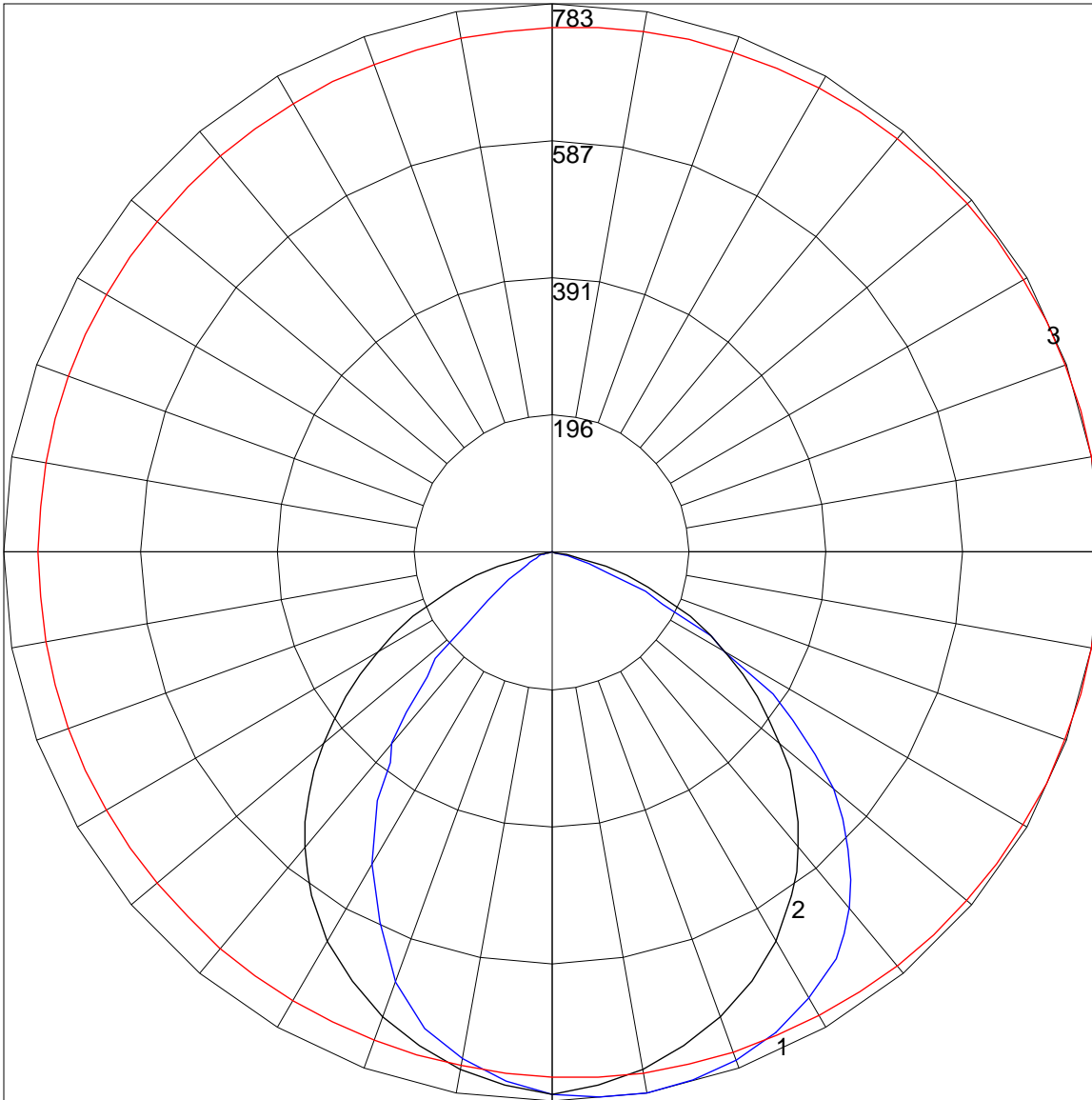
COEFFICIENTS OF UTILIZATION



FLUX DISTRIBUTION

	Lumens	Percent Of Luminaire
Downward Street Side	1090.1	59.9
Downward House Side	729.8	40.1
Downward Total	1819.9	100.0
Upward Street Side	0.0	0.0
Upward House Side	0.0	0.0
Upward Total	0.0	0.0
Total Flux	1819.9	100.0

POLAR GRAPH



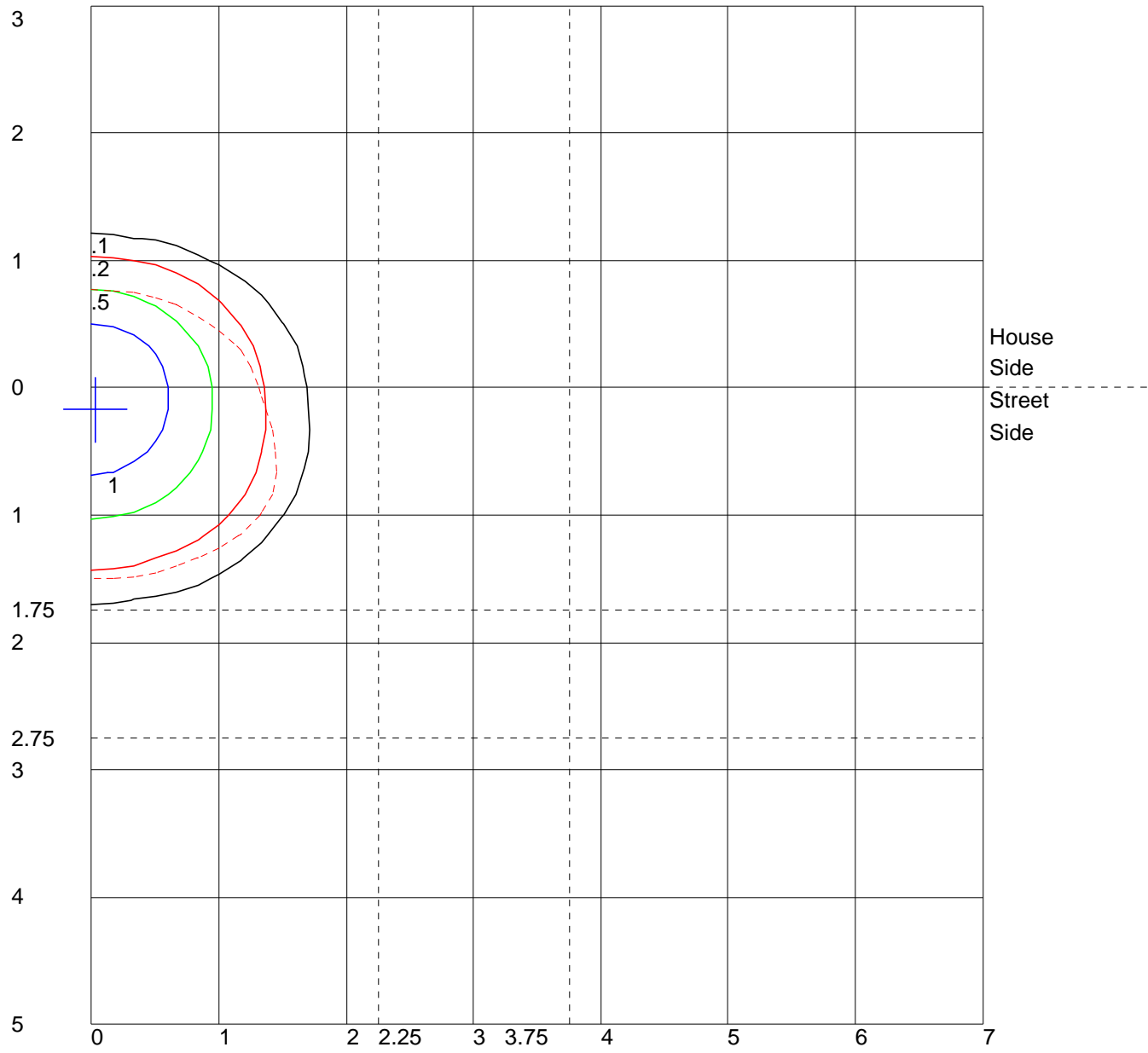
Maximum Candela = 782.84 Located At Horizontal Angle = 10, Vertical Angle = 10

1 - Vertical Plane Through Horizontal Angles (10 - 190) (Through Max. Cd.)

2 - Vertical Plane Through Horizontal Angles (90 - 270)

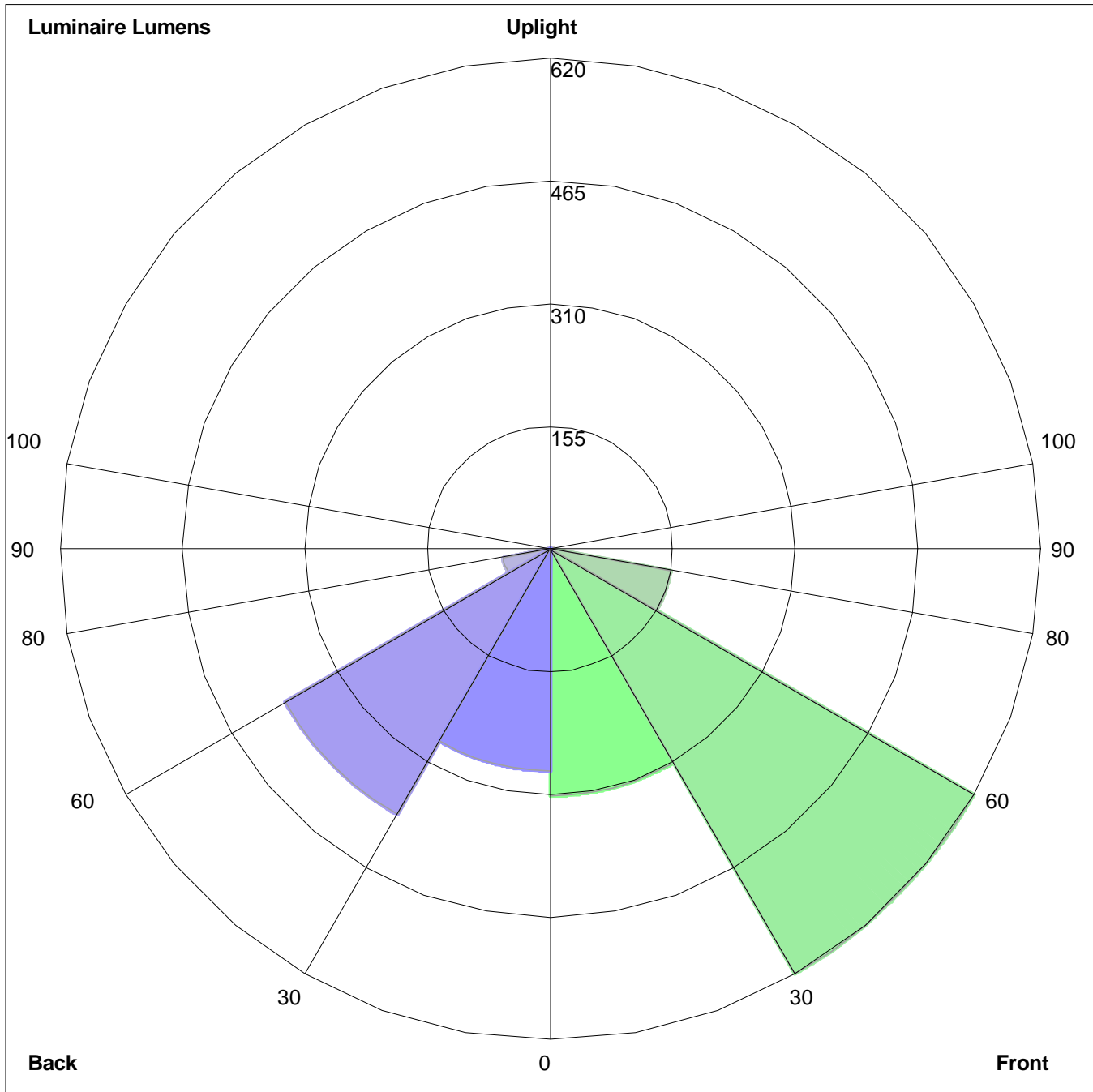
3 - Horizontal Cone Through Vertical Angle (10) (Through Max. Cd.)

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=311.7, Medium=619.6, High=154.7, Very High=4.1
 Back: Low=279.9, Medium=387.0, High=60.2, Very High=2.7
 Uplight: Low=0.0, High=0.0

BUG Rating : B1-U0-G0