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

Test #: L10121701
Date: 10/9/2012

NVLAP LAB CODE 200927-0

Test Report: **L10121701**

Model Number: **ASFL-1650-L-48WLED-120V**

Report Prepared For: PACE ILLUMINATION
5500 W. 111th Street, Oak Lawn, IL 60453

Test: Electrical and Photometric tests as required by the IESNA test standards.

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

Description of Sample: Client submitted the sample. Fixture catalog number is ASFL-1650-L-48WLED-120V. Received in working and undamaged condition. No modifications were necessary.

Sample Arrival Date: 10/2/12

Date of Tests: 10/8/12 - 10/9/12

Seasoning of Sample SSL: 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	01/04/13
Xitron Power Analysis System	2503AH	MT-EL01	01/09/13
Fluke Digital Thermometer	52k/J	MT-TP02-GC	01/04/13
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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LM-79 Test Summary	
Manufacturer:	PACE ILLUMINATION
Model Number:	ASFL-1650-L-48WLED-120V
LAMPCAT:	N/A
Driver Model:	AC ELECTRONICS AC-60CD350UV
Total Lumens:	2948.70
Input Voltage (VAC):	120.00
Input Current (Amp):	0.38
Input Power (W):	45.65
Input Power Factor:	1.00
Total Harmonic Distortion @ 120V(%):	6%
Total Harmonic Distortion @ 277V(%):	16% (0.18A, 46.83W, 0.96PF)
Efficacy:	64.59
Color Rendering Index (CRI):	72.38
Correlated Color Temperature (CCT):	6430
Chromaticity Coordinate x:	0.3150
Chromaticity Coordinate y:	0.3213
Ambient Temperature (°F):	77.0
Stabilization Time (Hours):	1:30
Total Operating Time (Hours):	2:30

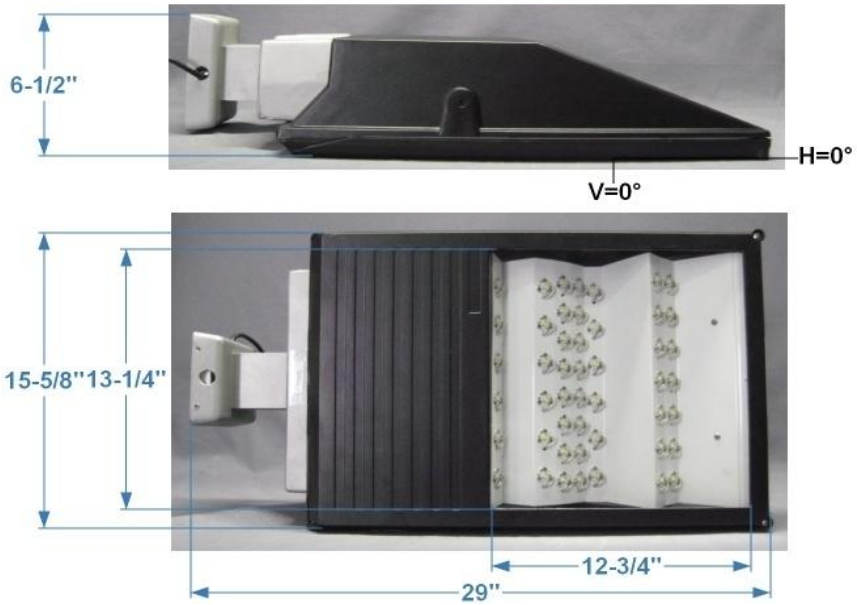

FIG. 1 LUMINAIRE

*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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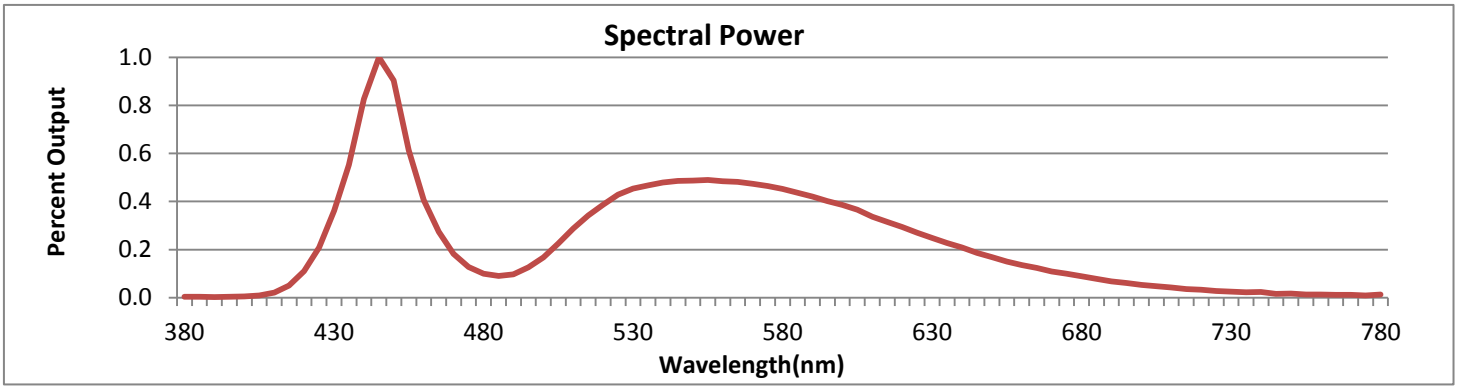


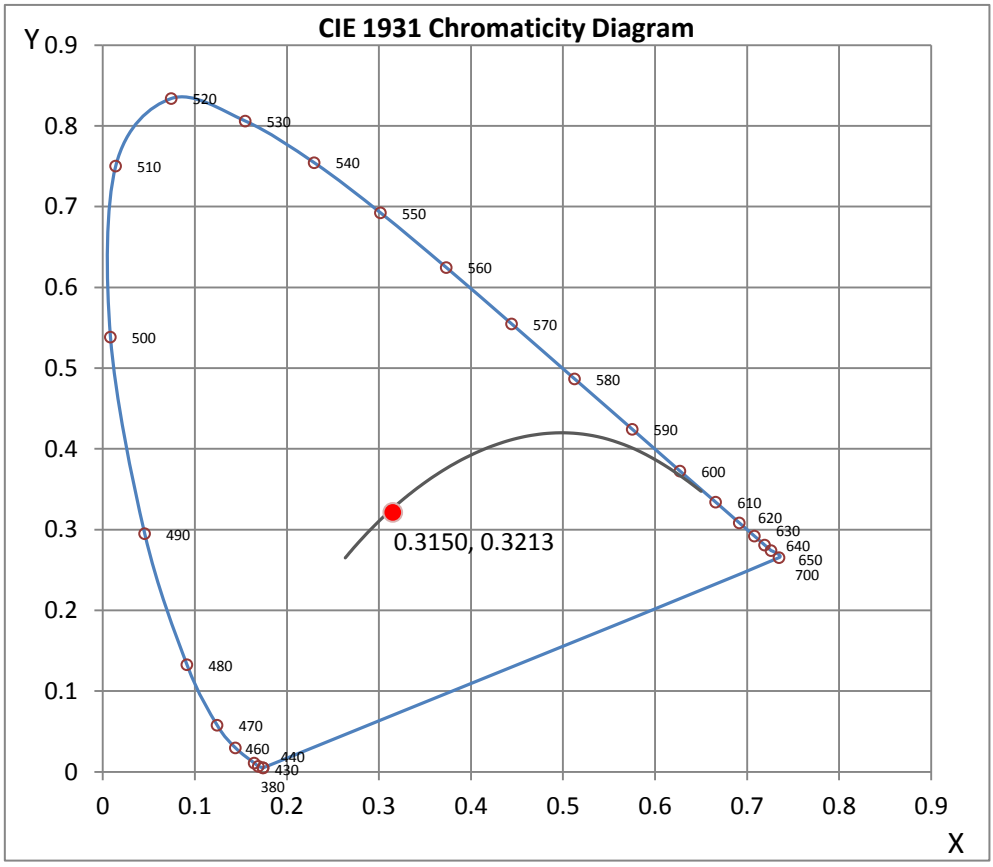
Wavelength	W/m²nm	440	0.4516	510	0.1570	580	0.2473	650	0.0920	720	0.0180
380	0.0022	450	0.4940	520	0.2116	590	0.2298	660	0.0742	730	0.0136
390	0.0010	460	0.2216	530	0.2479	600	0.2108	670	0.0596	740	0.0127
400	0.0023	470	0.0993	540	0.2619	610	0.1838	680	0.0484	750	0.0095
410	0.0117	480	0.0545	550	0.2661	620	0.1605	690	0.0367	760	0.0069
420	0.0605	490	0.0528	560	0.2645	630	0.1360	700	0.0290	770	0.0061
430	0.1979	500	0.0917	570	0.2587	640	0.1140	710	0.0229	780	0.0068

CRI & CCT

x	0.3150
y	0.3213
u'	0.2024
v'	0.4645
CRI	72.38
CCT	6430
Duv	-0.00199

R Values

R1	73.29
R2	74.51
R3	72.47
R4	75.07
R5	73.94
R6	65.07
R7	78.84
R8	65.88
R9	-11.03
R10	36.92
R11	74.07
R12	43.30
R13	72.11
R14	84.16



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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^{o}C and is measured from the center of the fixture, within 1ft from the outside of the fixture. Temperature is maintained at 25^{o}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^{o}C and is measured from the center of the fixture, within 1ft from the outside of the fixture. Temperature is maintained at 25^{o}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.

Test Report Released by:

Joseph Shin
Engineering Manager

Test Report Reviewed by:

Steve Kang
Quality Assurance

**Attached are photometric data reports. Total number of pages: 13*

*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 : L10121701.IES

DESCRIPTIVE INFORMATION (From Photometric File)

IESNA:LM-63-2002
[TEST] L10121701
[TESTLAB] LIGHT LABORATORY, INC.
[ISSUEDATE] 10/9/2012
[MANUFAC] PACE ILLUMINATION
[LUMCAT] ASFL-1650-L-48WLED-120V
[LUMINAIRE] 29"L. X 15-5/8"W. X 6-1/2"H. LED ROADWAY FIXTURE
[MORE] 48 DAYLIGHT LEDS MOUNTED ON WHITE REFLECTOR
[MORE] WITH CLEAR ACYLIC LENS
[BALLASTCAT] AC ELECTRONICS AC-60CD350UV
[BALLAST] INPUT: 120-277VAC, 50/60Hz, 0.6-0.26A OUTPUT: 350mA, 119-171V, 60W
[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, 45.65W
[_TEST PROCEDURE] IESNA:LM-79-08

CHARACTERISTICS

IES Classification	Type III
Longitudinal Classification	Very Short
Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Luminaire Lumens	2949
Downward Total Efficiency	N.A. (absolute)
Total Luminaire Efficiency	N.A. (absolute)
Luminaire Efficacy Rating (LER)	65
Total Luminaire Watts	45.65
Ballast Factor	1.00
Upward Waste Light Ratio	0.00
Maximum Candela	1224
Maximum Candela Angle	5H 20V
Maximum Candela (<90 Degrees Vertical)	1224
Maximum Candela Angle (<90 Degrees Vertical)	5H 20V
Maximum Candela At 90 Degrees Vertical	0 (0.0% Luminaire Lumens)
Maximum Candela from 80 to <90 Degrees Vertical	84 (2.8% Luminaire Lumens)
Cutoff Classification (deprecated)	N.A. (absolute)

IES ROAD REPORT
PHOTOMETRIC FILENAME : L10121701.IES

LUMINAIRE CLASSIFICATION SYSTEM (LCS)

	Lumens	% Lamp	% Luminaire
FL - Front-Low (0-30)	484.6	N.A.	16.4
FM - Front-Medium (30-60)	1034.9	N.A.	35.1
FH - Front-High (60-80)	339.6	N.A.	11.5
FVH - Front-Very High (80-90)	12.2	N.A.	0.4
BL - Back-Low (0-30)	389.0	N.A.	13.2
BM - Back-Medium (30-60)	568.0	N.A.	19.3
BH - Back-High (60-80)	114.5	N.A.	3.9
BVH - Back-Very High (80-90)	5.9	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	2948.7	N.A.	100.0
BUG Rating	B1-U0-G1		

IES ROAD REPORT
PHOTOMETRIC FILENAME : L10121701.IES

CANDELA TABULATION

Vert. Angles	Horizontal Angles									
	0	**5**	**15**	**25**	**35**	**45**	**55**	**65**	**75**	**85**
0	1123	1123	1123	1123	1123	1123	1123	1123	1123	1123
5	1169	1168	1167	1163	1160	1154	1150	1141	1135	1127
10	1193	1194	1191	1185	1177	1170	1159	1145	1131	1116
15	1210	1210	1208	1200	1190	1176	1159	1141	1119	1094
20	1223	1224	1218	1208	1192	1175	1150	1126	1097	1065
25	1221	1224	1219	1205	1187	1163	1133	1103	1069	1029
30	1204	1204	1201	1193	1174	1145	1114	1072	1024	972
35	1183	1184	1176	1165	1141	1117	1068	1001	943	887
40	1134	1133	1129	1120	1100	1050	994	929	868	806
45	1083	1081	1073	1056	1033	976	914	859	790	725
50	1036	1036	1021	1000	932	883	834	766	697	621
55	872	871	863	863	849	787	727	657	591	513
60	798	792	790	749	690	686	605	542	481	412
65	565	569	577	581	582	518	498	429	370	305
70	396	394	389	358	343	355	342	298	235	182
75	240	240	237	225	222	190	186	163	121	82
80	84	84	78	80	78	79	71	53	38	25
85	13	13	13	13	13	12	12	12	12	11
90	0	0	0	0	0	0	0	0	0	0
95	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0
105	0	0	0	0	0	0	0	0	0	0
110	0	0	0	0	0	0	0	0	0	0
115	0	0	0	0	0	0	0	0	0	0
120	0	0	0	0	0	0	0	0	0	0
125	0	0	0	0	0	0	0	0	0	0
130	0	0	0	0	0	0	0	0	0	0
135	0	0	0	0	0	0	0	0	0	0
140	0	0	0	0	0	0	0	0	0	0
145	0	0	0	0	0	0	0	0	0	0
150	0	0	0	0	0	0	0	0	0	0
155	0	0	0	0	0	0	0	0	0	0
160	0	0	0	0	0	0	0	0	0	0
165	0	0	0	0	0	0	0	0	0	0
170	0	0	0	0	0	0	0	0	0	0
175	0	0	0	0	0	0	0	0	0	0
180	0	0	0	0	0	0	0	0	0	0

Vert. Angles	Horizontal Angles									
	90	**95**	**105**	**115**	**125**	**135**	**145**	**155**	**165**	**175**
0	1123	1123	1123	1123	1123	1123	1123	1123	1123	1123
5	1121	1116	1106	1095	1084	1075	1068	1064	1062	1061
10	1108	1097	1078	1061	1042	1030	1018	1011	1005	1004
15	1083	1070	1044	1017	994	976	958	948	941	938
20	1050	1034	998	964	937	910	894	879	870	868
25	1010	987	945	905	871	843	822	807	799	795
30	947	921	877	837	799	770	749	731	719	717
35	859	830	777	736	714	691	666	647	634	628
40	775	743	686	637	610	598	577	555	542	536
45	690	655	594	547	514	488	480	460	444	437
50	584	549	493	449	421	389	371	370	363	358
55	476	441	389	354	322	304	290	298	297	297

IES ROAD REPORT
PHOTOMETRIC FILENAME : L10121701.IES

CANDELA TABULATION - (Cont.)

60	376	344	293	256	235	228	227	229	243	241
65	273	246	208	180	164	160	168	150	142	129
70	160	142	116	100	99	89	76	78	80	82
75	70	61	51	50	43	44	46	47	47	48
80	22	20	19	19	21	22	22	23	23	24
85	11	11	11	11	11	11	11	11	11	11
90	0	0	0	0	0	0	0	0	0	0
95	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0
105	0	0	0	0	0	0	0	0	0	0
110	0	0	0	0	0	0	0	0	0	0
115	0	0	0	0	0	0	0	0	0	0
120	0	0	0	0	0	0	0	0	0	0
125	0	0	0	0	0	0	0	0	0	0
130	0	0	0	0	0	0	0	0	0	0
135	0	0	0	0	0	0	0	0	0	0
140	0	0	0	0	0	0	0	0	0	0
145	0	0	0	0	0	0	0	0	0	0
150	0	0	0	0	0	0	0	0	0	0
155	0	0	0	0	0	0	0	0	0	0
160	0	0	0	0	0	0	0	0	0	0
165	0	0	0	0	0	0	0	0	0	0
170	0	0	0	0	0	0	0	0	0	0
175	0	0	0	0	0	0	0	0	0	0
180	0	0	0	0	0	0	0	0	0	0

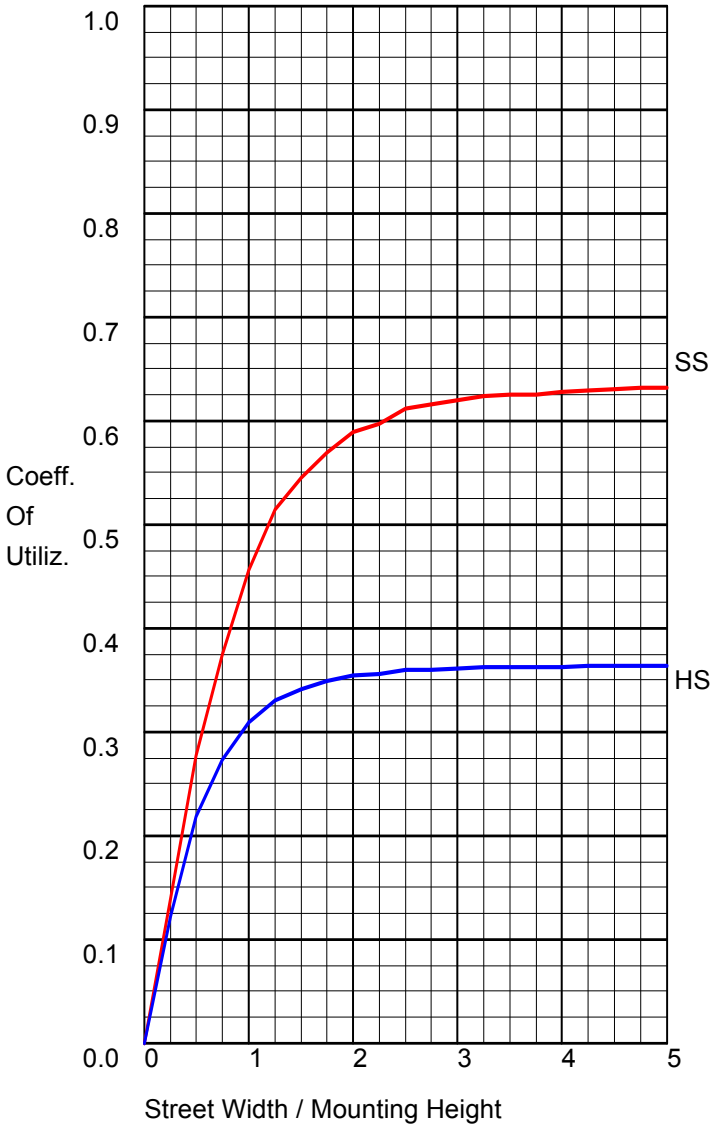
Vert. Angles	**Horizontal Angles**
	180
0	1123
5	1063
10	1003
15	937
20	866
25	795
30	716
35	627
40	535
45	437
50	357
55	297
60	240
65	127
70	82
75	49
80	24
85	11
90	0
95	0
100	0
105	0
110	0
115	0
120	0
125	0
130	0

CANDELA TABULATION - (Cont.)

135	0
140	0
145	0
150	0
155	0
160	0
165	0
170	0
175	0
180	0

IES ROAD REPORT
PHOTOMETRIC FILENAME : L10121701.IES

COEFFICIENTS OF UTILIZATION



FLUX DISTRIBUTION

	Lumens	Percent Of Luminaire
Downward Street Side	1871.3	63.5
Downward House Side	1077.4	36.5
Downward Total	2948.7	100.0
Upward Street Side	0.0	0.0
Upward House Side	0.0	0.0
Upward Total	0.0	0.0
Total Flux	2948.7	100.0

IES ROAD REPORT
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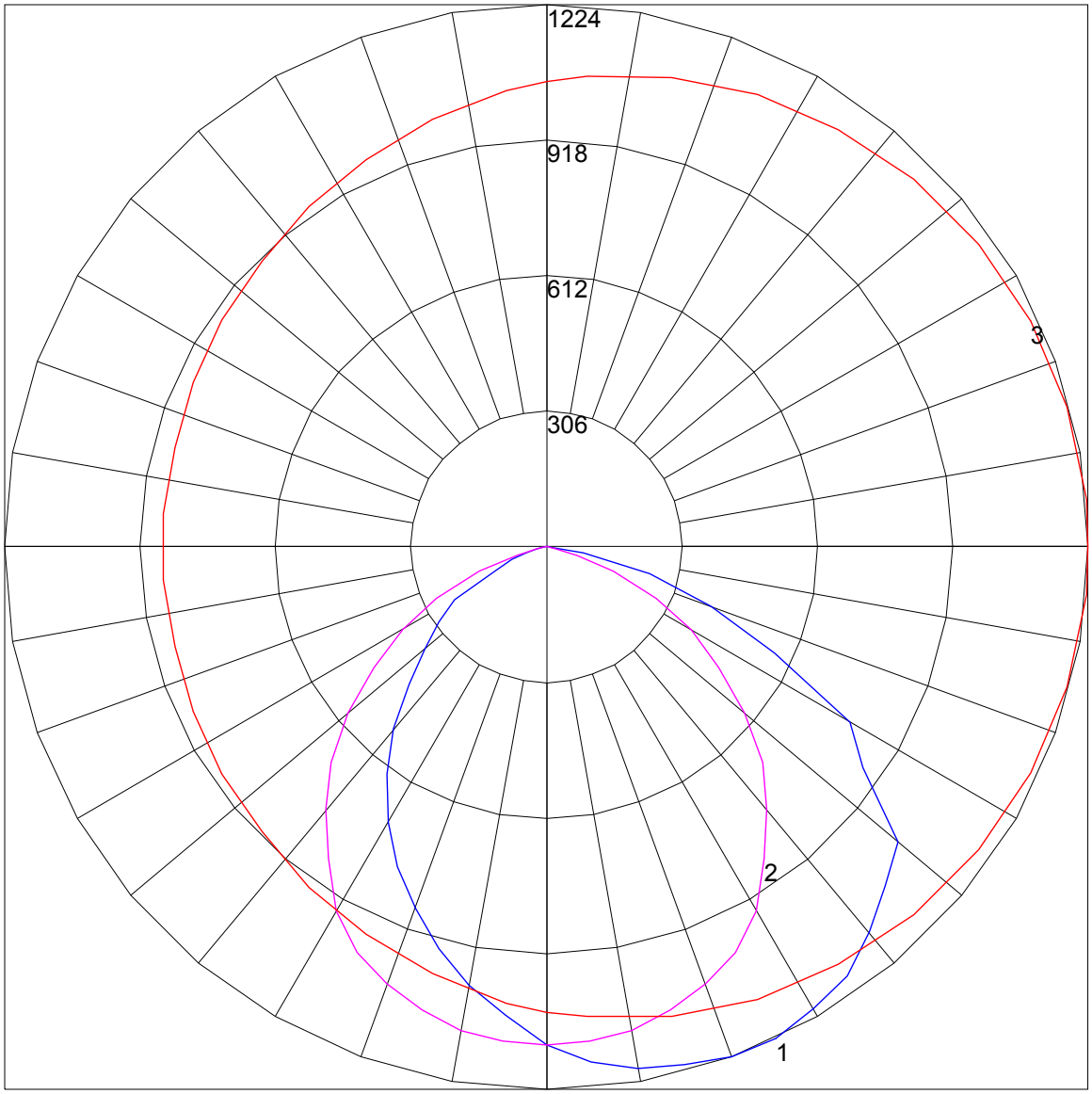
POLAR GRAPH



Maximum Candela = 1224 Located At Horizontal Angle = 5, Vertical Angle = 20
1 - Vertical Plane Through Horizontal Angles (5 - 185) (Through Max. Cd.) : BLUE
2 - Vertical Plane Through Horizontal Angles (90 - 270) : MAGENTA
3 - Horizontal Cone Through Vertical Angle (20) (Through Max. Cd.) : RED

IES ROAD REPORT
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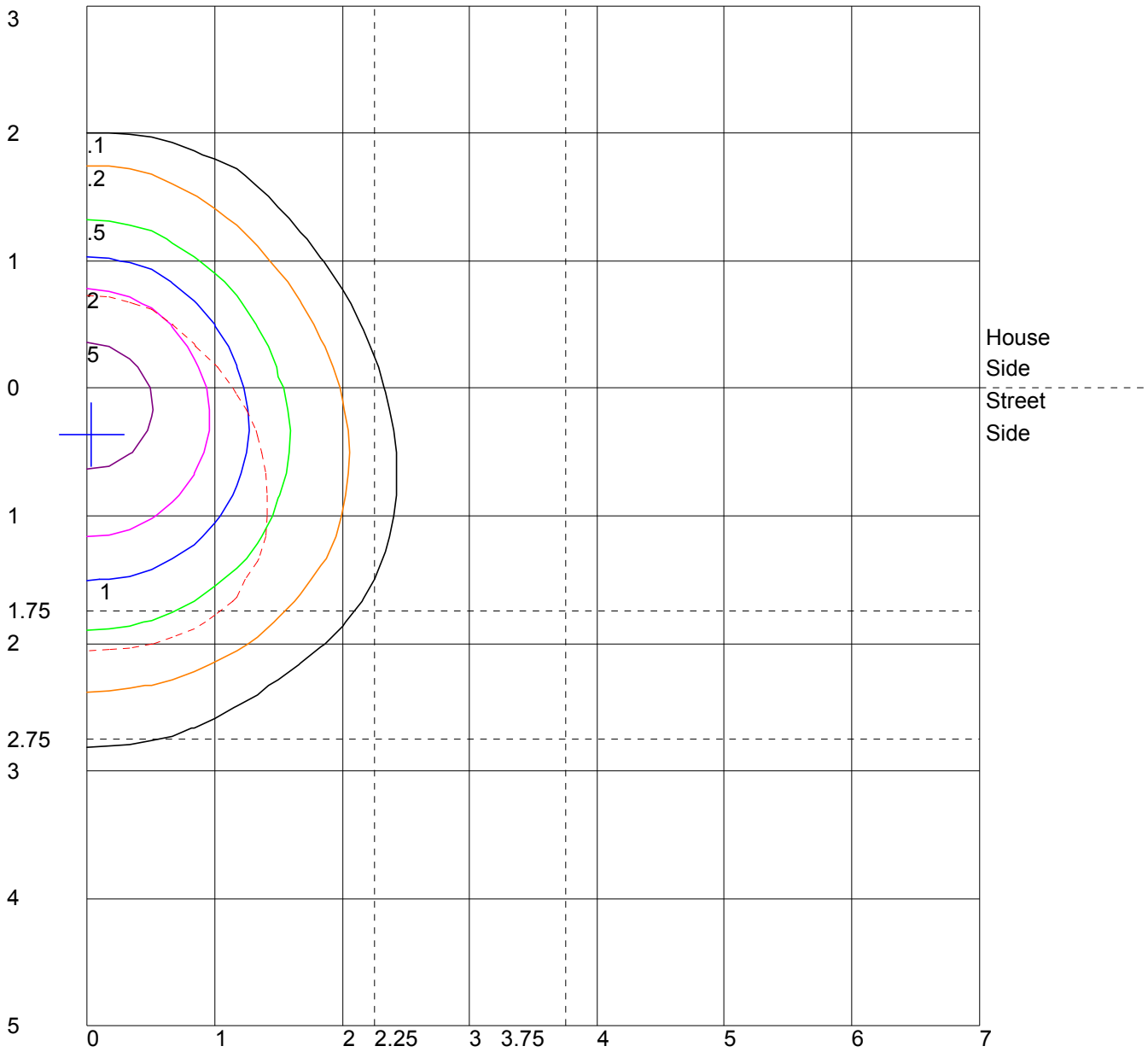
ISOFOOTCANDLE LINES OF HORIZONTAL ILLUMINANCE



Distance In Units Of Mounting Height
Values Based On 12 Foot Mounting Height
1/2 Maximum Candela Trace Shown As Dashed Curve
(+) = Maximum Candela Point

IES ROAD REPORT
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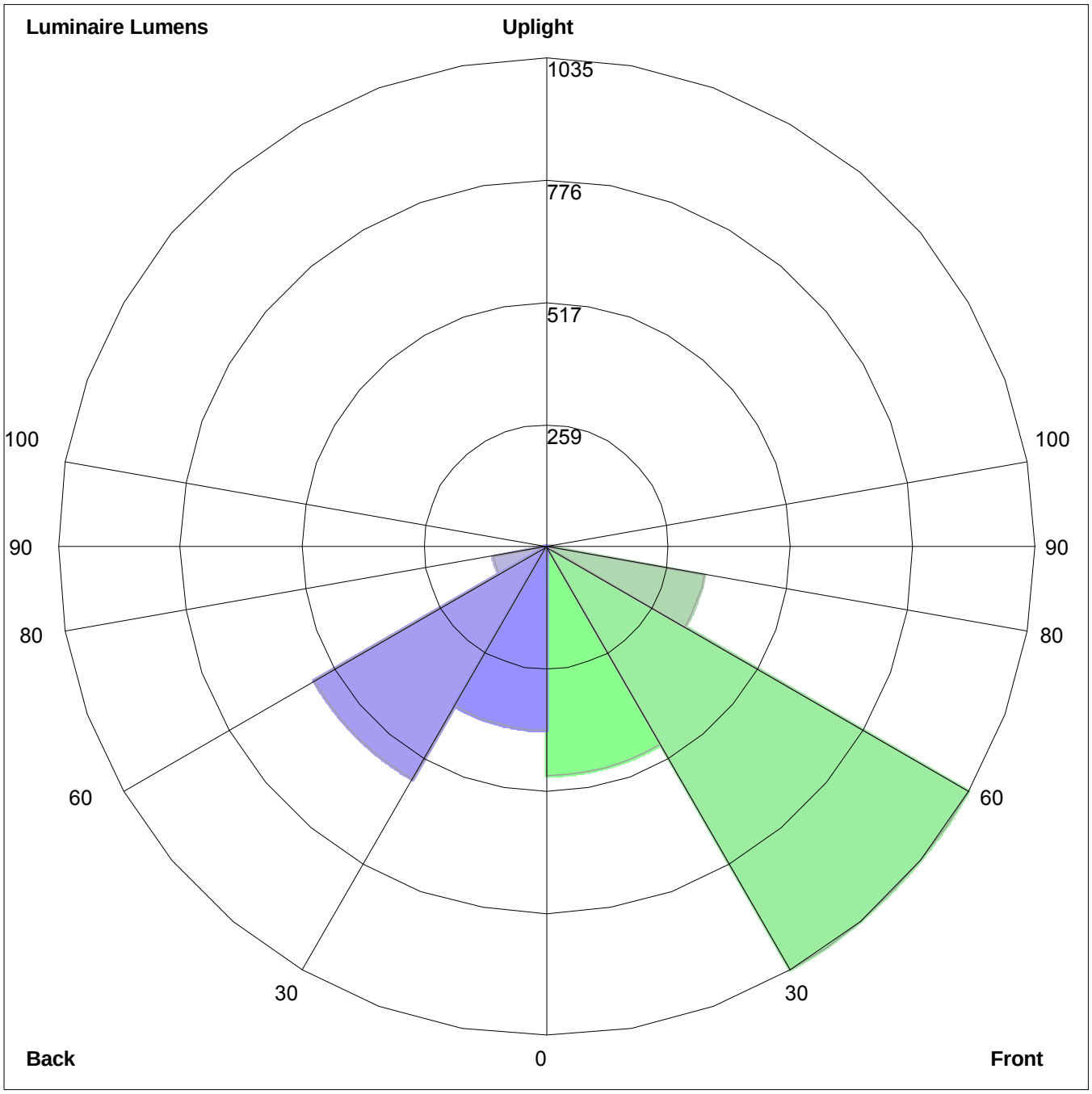
LUMINAIRE CLASSIFICATION SYSTEM (LCS) GRAPH



Luminaire Lumens:
Front: Low=484.6, Medium=1034.9, High=339.6, Very High=12.2
Back: Low=389.0, Medium=568.0, High=114.5, Very High=5.9
Uplight: Low=0.0, High=0.0

BUG Rating : B1-U0-G1