

itl boulder
THE LIGHT CENTER OF THE INDUSTRY SINCE 1955

PHONE: (303) 442-1255

FAX: (970) 535-3114

E-MAIL: itl@itlboulder.com

WEBSITE: www.itlboulder.com

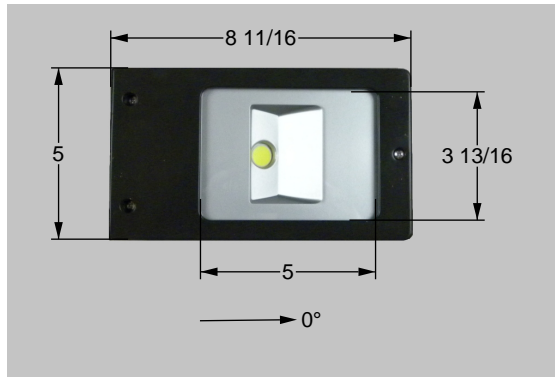
NVLAP
NVLAP LAB CODE: 200925-0

INDEPENDENT TESTING LABORATORIES, INC.

4066 CAMELOT CIRCLE, LONGMONT, CO 80504 USA

ISOFOOTCANDLE LINES OF HORIZONTAL ILLUMINATION

Values based on 15 foot mounting height.



REPORT NUMBER: ITL82640

ISSUE DATE: 09/05/14

PAGE: 1 OF 8

PREPARED FOR: RAB LIGHTING, INC.

CATALOG NUMBER: WPLED13 (WALLPACK) -

ALED13 (AREA LIGHTER) - BLED13 (Bollard)

LUMINAIRE: CAST METAL HOUSING, ONE

CIRCUIT BOARD WITH ONE LED, MOLDED PLASTIC REFLECTOR WITH SEMI-DIFFUSE FINISH, CLEAR FLAT GLASS LENS IN CAST BROWN PAINTED METAL FRAME.

LAMP: ONE WHITE MULTI-CHIP LIGHT

EMITTING DIODE (LED), TILTED 30-DEGREES FROM VERTICAL BASE-UP POSITION.

TOTAL INPUT WATTS = 14.8 AT 120.0 VOLTS

LED DRIVER: RAB LIGHTING RD113-36-C0350

NOTE: DATA SHOWN IS ABSOLUTE FOR THE

SAMPLE PROVIDED AT RATED INPUT VOLTAGE (120VAC, 60Hz) TO THE DRIVER. DRIVER INFORMATION PROVIDED BY CLIENT.

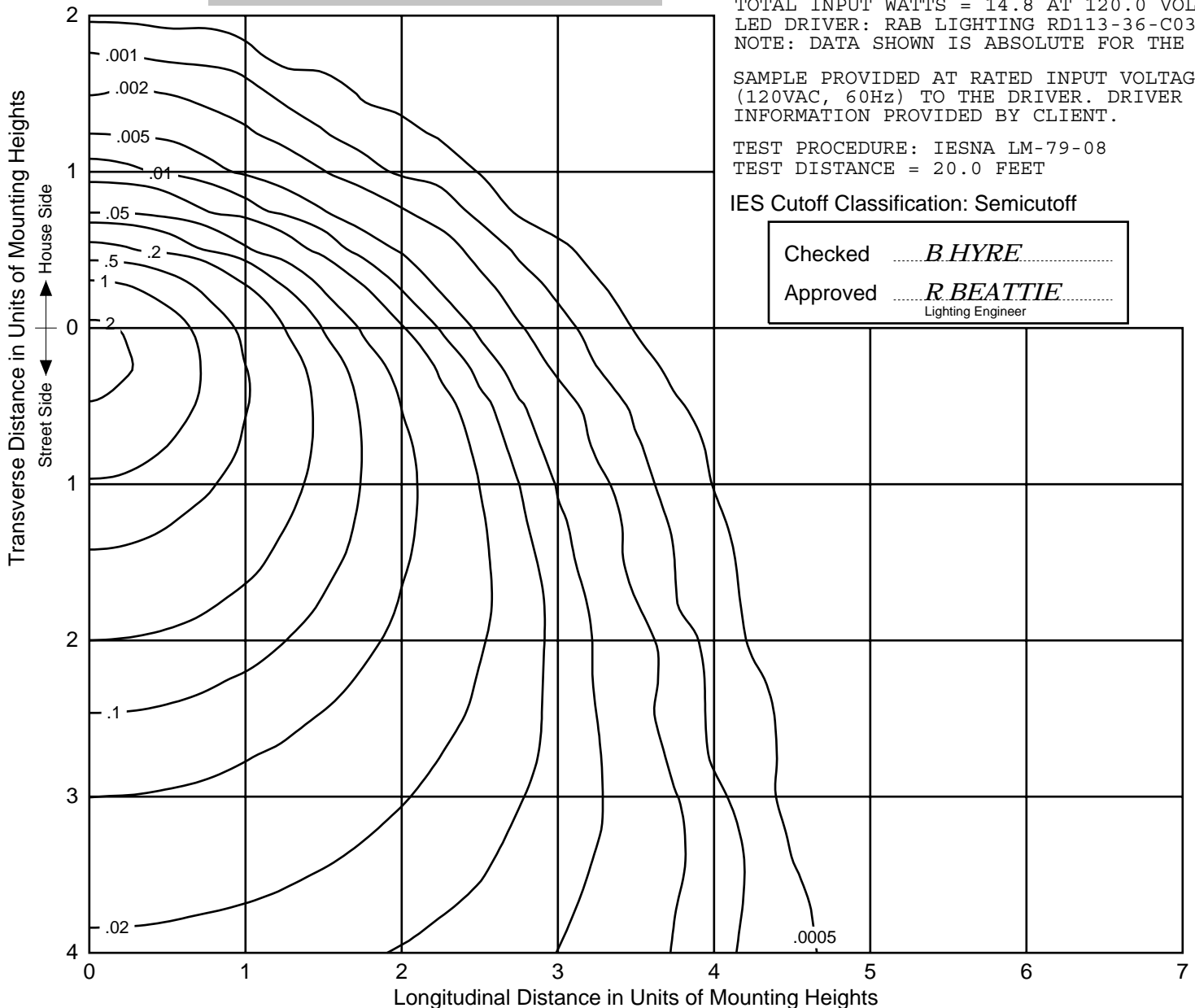
TEST PROCEDURE: IESNA LM-79-08

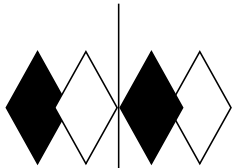
TEST DISTANCE = 20.0 FEET

IES Cutoff Classification: Semicutoff

Checked *B. HYRE*

Approved *R. BEATTIE*
Lighting Engineer





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PREPARED FOR: RAB LIGHTING, INC.

CATALOG NUMBER: WPLED13 (WALLPACK) -

ALED13 (AREA LIGHTER)

LUMINAIRE: CAST METAL HOUSING, ONE
CIRCUIT BOARD WITH ONE LED, MOLDED
PLASTIC REFLECTOR WITH SEMI-DIFFUSE
FINISH, CLEAR FLAT GLASS LENS IN CAST
BROWN PAINTED METAL FRAME.

LAMP: ONE WHITE MULTI-CHIP LIGHT
EMITTING DIODE (LED), TILTED 30-
DEGREES FROM VERTICAL BASE-UP
POSITION.

TOTAL INPUT WATTS = 14.8 AT 120.0 VOLTS

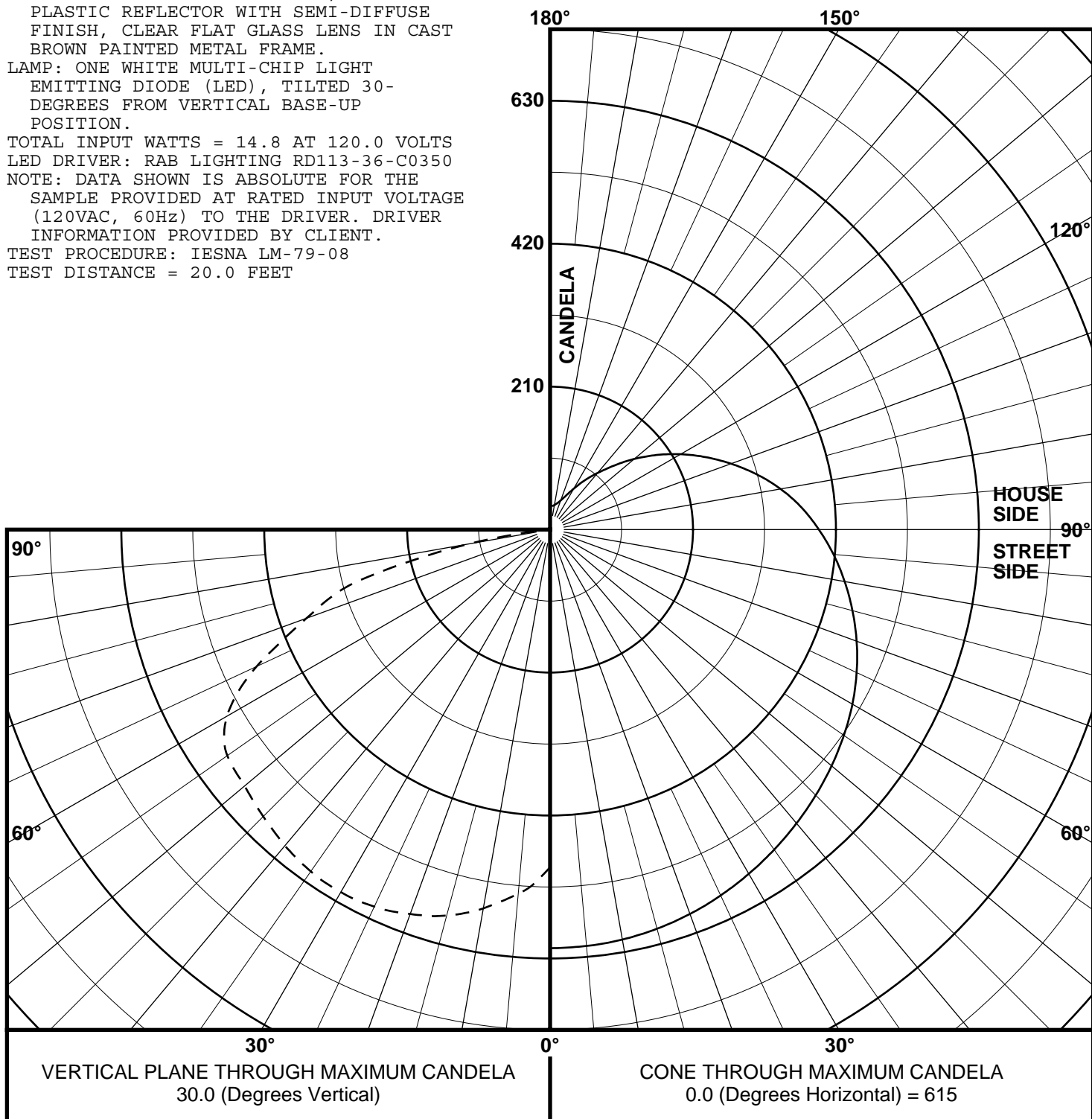
LED DRIVER: RAB LIGHTING RD113-36-C0350

NOTE: DATA SHOWN IS ABSOLUTE FOR THE
SAMPLE PROVIDED AT RATED INPUT VOLTAGE
(120VAC, 60Hz) TO THE DRIVER. DRIVER
INFORMATION PROVIDED BY CLIENT.

TEST PROCEDURE: IESNA LM-79-08

TEST DISTANCE = 20.0 FEET

MAXIMUM PLANE AND MAXIMUM CONE PLOTS OF CANDELA

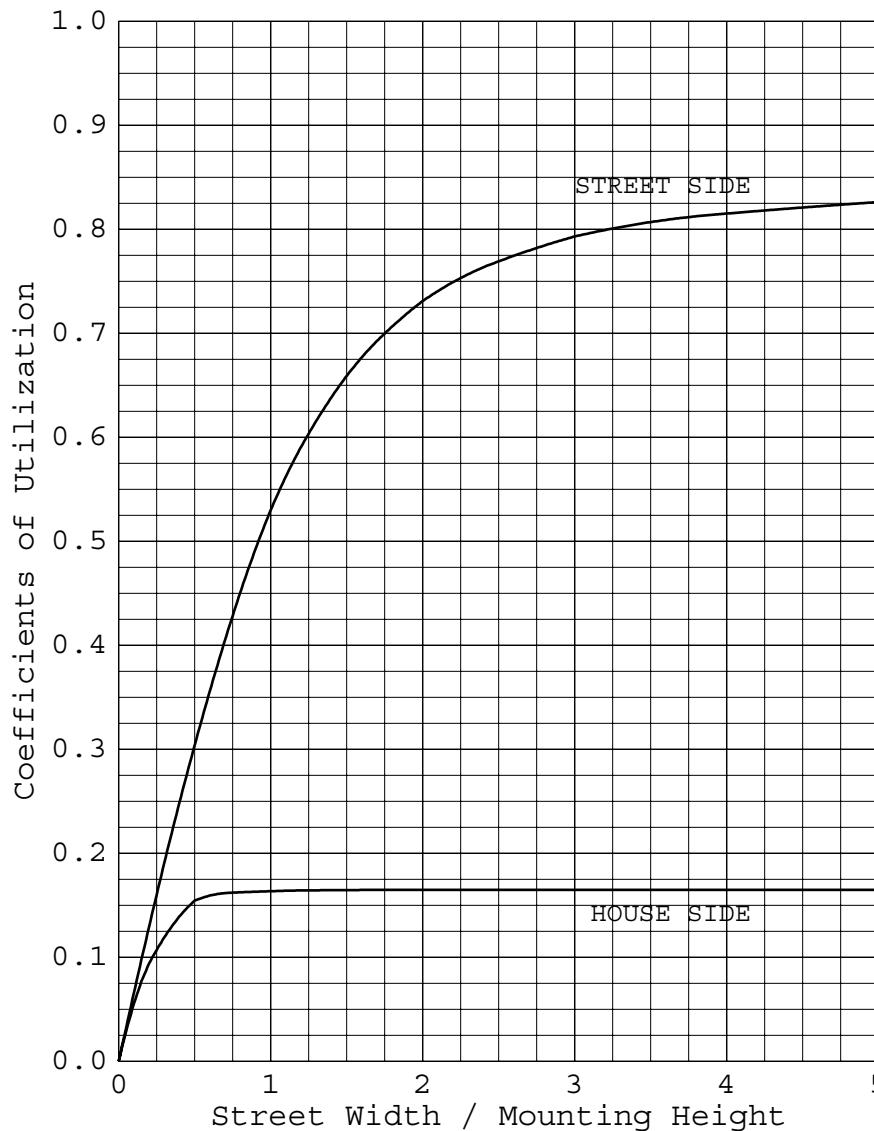




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PAGE: 3 OF 8

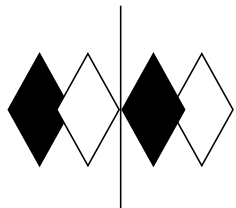
COEFFICIENTS OF UTILIZATION AND FLUX DISTRIBUTION



	LUMENS	PERCENT OF FIXTURE
DOWNWARD STREET SIDE	999	83.4
DOWNWARD HOUSE SIDE	198	16.5
DOWNWARD TOTAL	1196	100.0
UPWARD STREET SIDE	0	0.0
UPWARD HOUSE SIDE	0	0.0
UPWARD TOTAL	0	0.0
TOTAL FLUX	1197	100.0

EFFICACY = 80.9 lm/W

ALL CANDELA AND LUMENS IN THIS REPORT ARE BASED ON ABSOLUTE PHOTOMETRY.
THE COEFFICIENT OF UTILIZATION VALUES ARE BASED ON THE TOTAL ABSOLUTE
LUMEN OUTPUT OF THIS LUMINAIRE SAMPLE.



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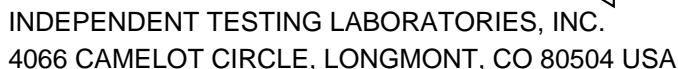
FLUX DISTRIBUTION BY SOLID ANGLE

(PER IESNA TM-15-11, LUMINAIRE CLASSIFICATION
SYSTEM FOR OUTDOOR LUMINAIRES)

	LUMENS	PERCENT OF FIXTURE	BUG ZONE RATINGS
FORWARD LIGHT	999.	83.4	
FL (0- 30)	227.7	19.0	
FM (30- 60)	531.1	44.4	
FH (60- 80)	230.4	19.3	G0
FVH(80- 90)	9.3	0.8	G0
BACK LIGHT	198.	16.5	
BL (0- 30)	123.4	10.3	B1
BM (30- 60)	71.4	6.0	B0
BH (60- 80)	3.2	0.3	B0 G0
BVH(80- 90)	0.0	0.0	G0
UPLIGHT	0.	0.0	
UL (90-100)	0.1	0.0	U1
UH (100-180)	0.0	0.0	U0
TRAPPED LIGHT	0.	0.0	
TOTAL FLUX	1197.	100.0	

BACKLIGHT, UPLIGHT, AND GLARE (BUG) RATINGS
(PER ADDENDUM A FOR IESNA TM-15-11)

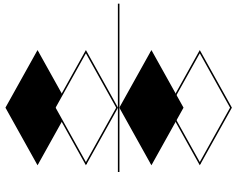
BUG RATING: B1 U1 G0



PAGE: 5 OF 8

STREET	SIDE	LATERAL ANGLE										
	0.0 	5.0	15.0	25.0	35.0	45.0	55.0	65.0	75.0	85.0	90.0	
180.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	
175.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	
165.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	
155.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	
145.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	
135.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	
125.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	
115.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	
105.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	
95.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	
92.5	1.	1.	1.	0.	0.	0.	0.	0.	0.	0.	0.	
90.0	3.	3.	3.	2.	1.	1.	0.	0.	0.	0.	0.	
87.5	8.	8.	8.	7.	4.	2.	2.	1.	0.	0.	0.	
85.0	15.	15.	15.	14.	12.	5.	3.	2.	1.	0.	0.	
V 82.5	47.	47.	51.	56.	50.	13.	6.	4.	2.	1.	1.	
E 80.0	121.	119.	122.	128.	125.	50.	13.	6.	4.	2.	2.	
R 77.5	203.	207.	205.	207.	193.	127.	32.	12.	6.	4.	3.	
T 75.0	292.	292.	286.	268.	234.	185.	91.	25.	12.	6.	4.	
I 72.5	343.	341.	330.	304.	273.	225.	159.	66.	22.	10.	7.	
C 70.0	381.	379.	370.	350.	318.	263.	199.	122.	50.	17.	12.	
A 67.5	426.	429.	418.	399.	363.	301.	231.	166.	91.	36.	20.	
L 65.0	476.	475.	463.	443.	405.	337.	266.	198.	129.	63.	39.	
62.5	517.	516.	503.	480.	438.	366.	296.	230.	160.	90.	61.	
A 60.0	548.	547.	533.	506.	460.	392.	325.	260.	190.	118.	85.	
N 57.5	568.	567.	552.	522.	476.	414.	352.	287.	219.	147.	113.	
G 55.0	579.	577.	562.	532.	489.	436.	378.	314.	248.	176.	142.	
L 52.5	583.	582.	567.	539.	502.	455.	402.	341.	276.	205.	171.	
E 50.0	586.	585.	572.	547.	514.	472.	423.	366.	303.	234.	200.	
47.5	591.	589.	577.	556.	526.	489.	443.	390.	327.	261.	226.	
45.0	596.	594.	583.	564.	537.	503.	460.	411.	352.	288.	254.	
42.5	601.	600.	590.	572.	547.	515.	476.	431.	375.	314.	281.	
40.0	606.	604.	596.	578.	555.	526.	490.	448.	396.	338.	307.	
37.5	610.	609.	601.	584.	562.	534.	502.	464.	415.	361.	332.	
35.0	613.	612.	604.	589.	567.	542.	512.	477.	433.	382.	355.	
32.5	615.	614.	607.	592.	571.	548.	521.	488.	447.	401.	376.	
30.0<<	615.	614.	607.	593.	574.	552.	527.	497.	460.	418.	395.	
25.0	611.	610.	604.	592.	576.	557.	536.	510.	480.	446.	428.	
20.0	601.	601.	595.	585.	572.	556.	539.	518.	493.	467.	453.	
15.0	587.	586.	582.	574.	562.	550.	535.	519.	501.	482.	471.	
10.0	565.	564.	561.	555.	546.	536.	526.	515.	503.	491.	484.	
5.0	537.	536.	534.	530.	524.	518.	512.	507.	501.	494.	491.	
0.0	496.	496.	496.	496.	496.	496.	496.	496.	496.	496.	496.	
		PLANE OF MAXIMUM CANDELA										
CONE OF MAXIMUM CANDELA												

THIS REPORT IS BASED ON PUBLISHED INDUSTRY PROCEDURES. FIELD PERFORMANCE MAY DIFFER FROM LABORATORY PERFORMANCE.



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CANDELA TABULATION

	HOUSE SIDE					LATERAL ANGLE				
	95.0	105.0	115.0	125.0	135.0	145.0	155.0	165.0	175.0	180.0
180.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
175.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
165.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
155.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
145.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
135.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
125.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
115.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
105.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
95.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
92.5	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
90.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
87.5	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
85.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
V 82.5	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
E 80.0	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.
R 77.5	2.	1.	0.	0.	0.	0.	0.	0.	0.	0.
T 75.0	3.	2.	1.	0.	0.	0.	0.	0.	0.	0.
I 72.5	5.	2.	1.	1.	0.	0.	0.	0.	0.	0.
C 70.0	8.	3.	2.	1.	1.	0.	0.	0.	0.	0.
A 67.5	13.	6.	3.	2.	1.	1.	1.	0.	0.	0.
L 65.0	20.	10.	3.	2.	2.	1.	1.	1.	1.	1.
62.5	35.	13.	5.	3.	2.	2.	2.	1.	1.	1.
A 60.0	56.	17.	8.	4.	3.	3.	2.	2.	2.	2.
N 57.5	80.	28.	12.	5.	4.	3.	3.	3.	3.	2.
G 55.0	107.	45.	15.	7.	5.	4.	4.	3.	3.	3.
L 52.5	136.	68.	19.	11.	6.	5.	5.	4.	4.	4.
E 50.0	165.	92.	32.	15.	8.	6.	6.	5.	5.	5.
47.5	194.	120.	51.	19.	12.	8.	7.	7.	6.	6.
45.0	222.	147.	75.	24.	18.	11.	8.	8.	7.	8.
42.5	250.	176.	102.	40.	22.	16.	11.	9.	9.	9.
40.0	277.	205.	132.	65.	26.	22.	16.	13.	11.	11.
37.5	303.	234.	162.	94.	40.	26.	23.	19.	17.	16.
35.0	327.	261.	192.	125.	66.	33.	27.	25.	24.	24.
32.5	350.	288.	223.	157.	99.	55.	33.	30.	29.	29.
30.0<<	371.	314.	252.	191.	133.	88.	55.	40.	35.	35.
25.0	408.	360.	309.	256.	209.	167.	131.	112.	98.	99.
20.0	438.	401.	361.	321.	282.	248.	220.	201.	191.	190.
15.0	460.	435.	406.	378.	350.	326.	305.	291.	284.	283.
10.0	477.	461.	444.	427.	411.	396.	384.	374.	370.	369.
5.0	487.	481.	474.	468.	461.	454.	449.	444.	441.	441.
0.0	496.	496.	496.	496.	496.	496.	496.	496.	496.	496.

CONE OF MAXIMUM CANDELA



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5-DEGREE
ZONAL LUMEN SUMMARY

0- 5	12
5- 10	34
10- 15	55
15- 20	72
20- 25	85
25- 30	93
30- 35	99
35- 40	103
40- 45	104
45- 50	103
50- 55	100
55- 60	94
60- 65	85
65- 70	69
70- 75	51
75- 80	29
80- 85	8
85- 90	1
90- 95	0
95-100	0
100-105	0
105-110	0
110-115	0
115-120	0
120-125	0
125-130	0
130-135	0
135-140	0
140-145	0
145-150	0
150-155	0
155-160	0
160-165	0
165-170	0
170-175	0
175-180	0

10-DEGREE
ZONAL LUMEN SUMMARY

0- 10	46
0- 20	173
0- 30	351
0- 40	553
0- 50	760
0- 60	954
0- 70	1107
0- 80	1187
0- 90	1196
0-100	1197
0-110	1197
0-120	1197
0-130	1197
0-140	1197
0-150	1197
0-160	1197
0-170	1197
0-180	1197



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ADDRESS: 170 LUDLOW AVE
NORTHVALE, NJ 07647

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REPORT NUMBER: ITL82646
DATE: 09/08/14
PREPARED FOR: RAB LIGHTING, INC.
CATALOG NUMBER: WPLED13 (WALLPACK) - ALED13 (AREA LIGHTER)

ADDRESS: 170 LUDLOW AVE
NORTHVALE, NJ 07647

LUMINAIRE: CAST METAL HOUSING, ONE CIRCUIT BOARD WITH ONE LED, MOLDED PLASTIC REFLECTOR WITH SEMI-DIFFUSE FINISH, CLEAR FLAT GLASS LENS IN CAST BROWN PAINTED METAL FRAME.

LAMP: ONE WHITE MULTI-CHIP LIGHT EMITTING DIODE (LED), TILTED 30-DEGREES FROM VERTICAL BASE-UP POSITION.

DRIVER: RAB LIGHTING RD113-36-C0350

NOTE: DATA SHOWN IS ABSOLUTE FOR THE SAMPLE PROVIDED AT RATED INPUT VOLTAGE (120.0 AND 277.0 VAC, 60Hz) TO THE DRIVER. DRIVER INFORMATION PROVIDED BY CLIENT.

INSTRUMENTS:	Associated Power Technologies APT5010 AC Power Source	Calibration Due: N/A
	Yokogawa WT210 Digital Power Meter #6	10/31/14
	Ocean Optics QE65000 Spectroradiometer	07/14/15
	ITL 1.5m Diameter Integrating Sphere S15-2, 4PI Geometry	07/14/15

OBJECT OF TEST: Measure the Total Radiant Flux*, Spectral Power Distribution (SPD), Correlated Color Temperature (CCT), Color Rendering Indices (CRI_a,1-14), Chromaticity Coordinates (x,y; u'v'), ANSI C78.377 Duv, and electrical data including ANSI C82.77-2002 Power Factor (PF) and Total Harmonic Distortion (THD) to the test sample. Report Off-State Power. Measure electrical data including Total Harmonic Distortion (THD) at maximum rated voltage.

PROCEDURE: The test sample was provided by the customer and had an unknown number of operating hours. The test sample was mounted inside the integrating sphere and allowed to stabilize. After stabilization occurred, measurements were taken. In order to measure mean performance, multiple data sets were recorded and averaged. Readings were taken with the test sample operating at 120.0 VAC input. Electrical data was also recorded at maximum nominal rated input voltage (277.0 VAC). All testing performed in a 25 +/-1 degree Celsius free air ambient and in accordance with IESNA LM-79-08. All data are traceable to the National Institute of Standards and Technology. Off-State Power was reported with no voltage applied to the sample.

*NOTE: Proper calibration of integrating spheres for measuring total flux output of non-directional samples will produce reliable, repeatable results within the calibration tolerances of the equipment used. However, measurement of test samples with significant self absorption and/or directional output, even when these effects are compensated for, are likely to have a greater variation in results compared to the flux output calculated from a goniophotometric exploration since these artifacts do not affect the goniophotometric results.

RESULTS: (continued subsequent pages)

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Checked	<u>P O'CONNOR</u>
Approved	<u>L GRABA</u> Lighting Engineer



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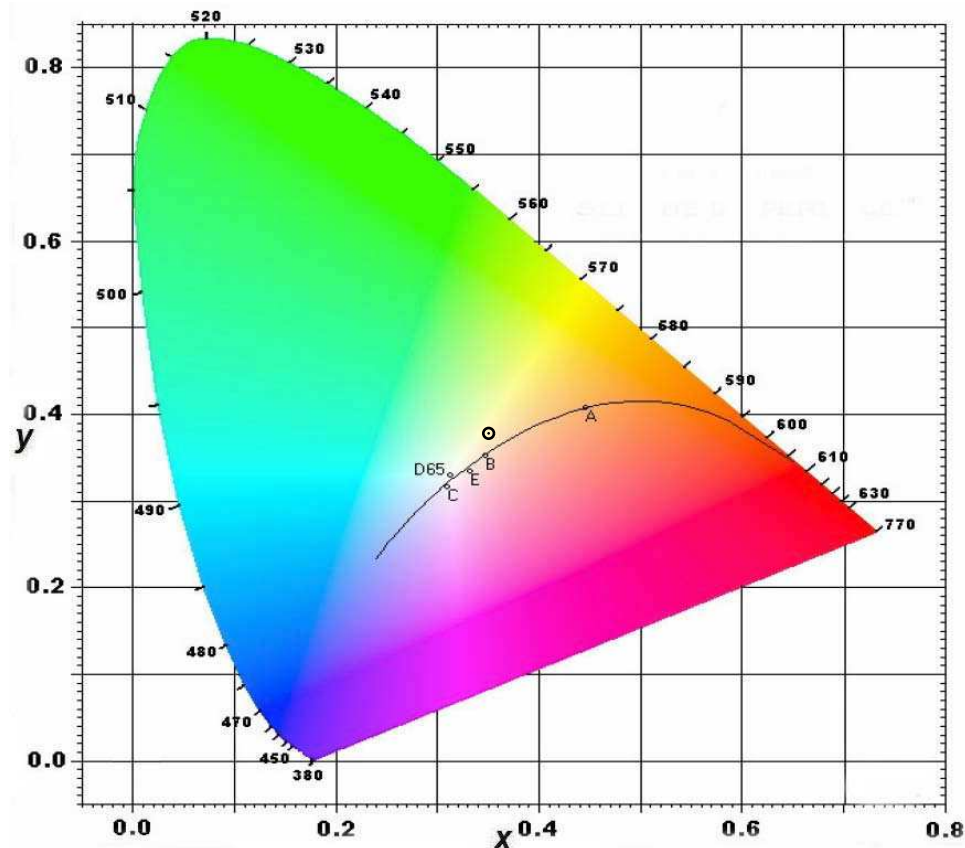
NVLAP[®]
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CIE Chromaticity Diagram



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CATALOG NUMBER: WPLED13 (WALLPACK) - ALED13 (AREA LIGHTER)

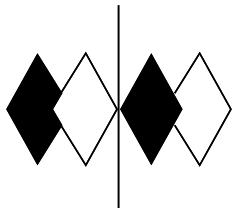
RESULTS:

SPECTRORADIOMETRIC	
Observer	CIE 1931 2 degree
Chromaticity Ordinate x	0.3503
Chromaticity Ordinate y	0.3776
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2051
Chromaticity Ordinate v'	0.4975
Correlated Color Temp CCT (K)	4906
ANSI C78.377-2008 Duv	0.011
Total Radiant Flux (milliWatts)	3471 *
ELECTRICAL	
Input Voltage (Volts AC)	120.0
Input Current (Amps AC)	0.125
Input Power (Watts)	14.8
Input Power Factor (%)	98.7
Input Current THD (%)	15.1
Input Voltage THD (%)	0.1
Off-State Power (Watts)	
	0.0
ELECTRICAL AT MAX NONIMAL INPUT	
Input Voltage (Volts AC)	277.0
Input Current (Amps AC)	0.058
Input Power (Watts)	15.4
Input Power Factor (%)	95.9
Input Current THD (%)	15.5
Input Voltage THD (%)	0.1

COLOR RENDERING INDICES	CRI
Ra (Average 1-8)	67
R1 Light greyish red	63
R2 Dark greyish yellow	71
R3 Strong yellowish green	77
R4 Moderate yellowish green	67
R5 Light bluish green	63
R6 Light blue	60
R7 Light violet	81
R8 Light reddish purple	54
R9 Strong red	-41
R10 Strong yellow	32
R11 Strong green	61
R12 Strong blue	29
R13 Light yellowish pink (skin)	64
R14 Moderate olive green (leaf)	87

*NOTE:

Proper calibration of integrating spheres for measuring total flux output of non-directional samples will produce reliable, repeatable results within the calibration tolerances of the equipment used. However, measurement of test samples with significant self absorption and/or directional output, even when these effects are compensated for, are likely to have a greater variation in results compared to the flux output calculated from a goniophotometric exploration since these artifacts do not affect the goniophotometric results.



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NVLAP
NVLAP LAB CODE: 200925-0

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PREPARED FOR: RAB LIGHTING, INC.
CATALOG NUMBER: WPLED13 (WALLPACK) - ALED13 (AREA LIGHTER)

RESULTS:

Wavelength	mW per nm	Wavelength	mW per nm	Wavelength	mW per nm
380	0.126	515	12.781	650	7.541
385	0.146	520	15.183	655	6.837
390	0.176	525	17.095	660	6.183
395	0.227	530	18.548	665	5.583
400	0.309	535	19.515	670	5.026
405	0.523	540	20.157	675	4.521
410	0.914	545	20.538	680	4.058
415	1.602	550	20.712	685	3.629
420	2.854	555	20.720	690	3.253
425	4.896	560	20.606	695	2.911
430	7.887	565	20.399	700	2.609
435	11.871	570	20.108	705	2.321
440	17.192	575	19.685	710	2.069
445	24.179	580	19.166	715	1.845
450	26.505	585	18.579	720	1.642
455	19.695	590	17.900	725	1.463
460	12.017	595	17.142	730	1.303
465	7.953	600	16.309	735	1.160
470	5.308	605	15.433	740	1.033
475	3.547	610	14.522	745	0.919
480	2.760	615	13.592	750	0.817
485	2.559	620	12.650	755	0.729
490	2.812	625	11.709	760	0.652
495	3.696	630	10.800	765	0.582
500	5.293	635	9.930	770	0.520
505	7.519	640	9.096	775	0.466
510	10.119	645	8.304	780	0.417

