



**itl boulder**  
THE LIGHT CENTER OF THE INDUSTRY SINCE 1955

PHONE: (303) 442-1255

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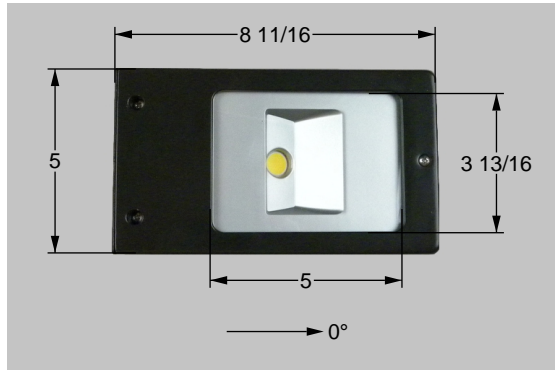
**NVLAP**  
NVLAP LAB CODE: 200925-0

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: ITL82639

ISSUE DATE: 09/04/14 PAGE: 1 OF 8

PREPARED FOR: RAB LIGHTING, INC.

CATALOG NUMBER: WPLED13N (WALLPACK) -

ALED13N (AREA LIGHTER) - BLED13N (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.

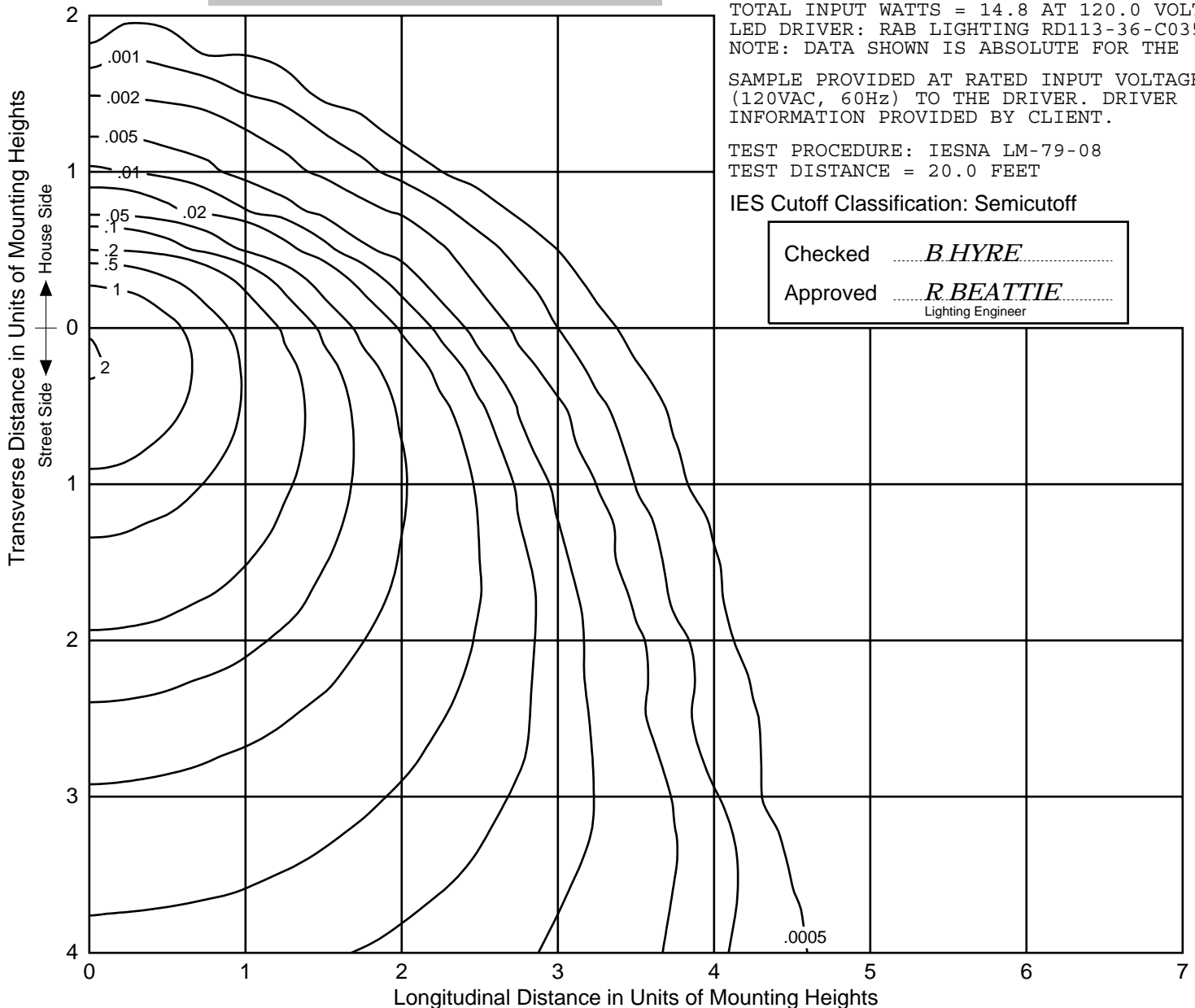
TEST PROCEDURE: IESNA LM-79-08

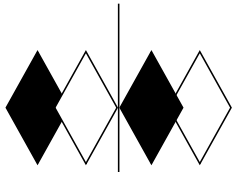
TEST DISTANCE = 20.0 FEET

IES Cutoff Classification: Semicutoff

Checked *B. HYRE*

Approved *R. BEATTIE*  
Lighting Engineer





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REPORT NUMBER: ITL82639

ISSUE DATE: 09/04/14 PAGE: 2 OF 8

PREPARED FOR: RAB LIGHTING, INC.

CATALOG NUMBER: WPLED13N (WALLPACK) -

ALED13N (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.

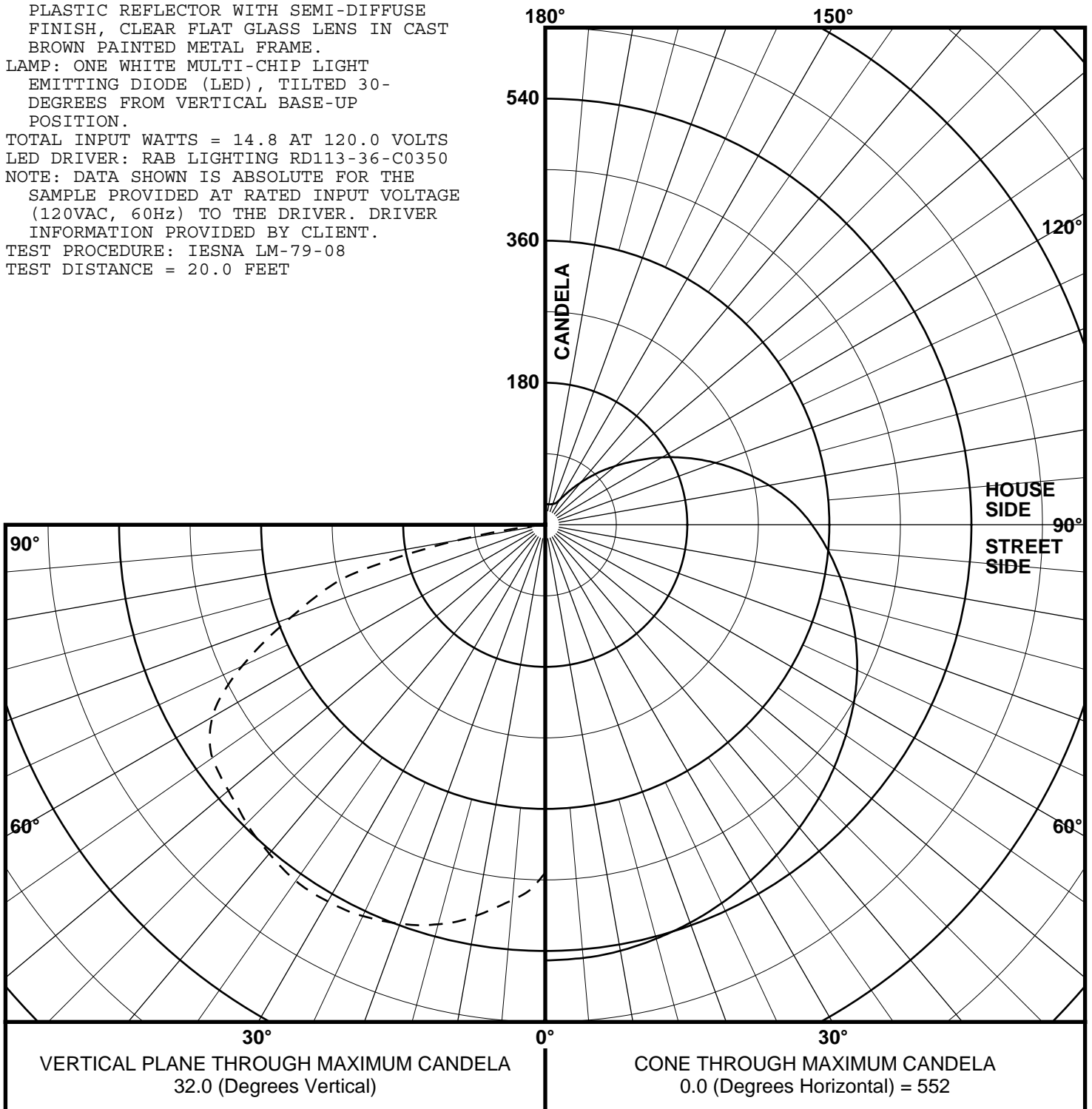
TOTAL INPUT WATTS = 14.8 AT 120.0 VOLTS  
LED DRIVER: RAB LIGHTING RD113-36-C0350

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

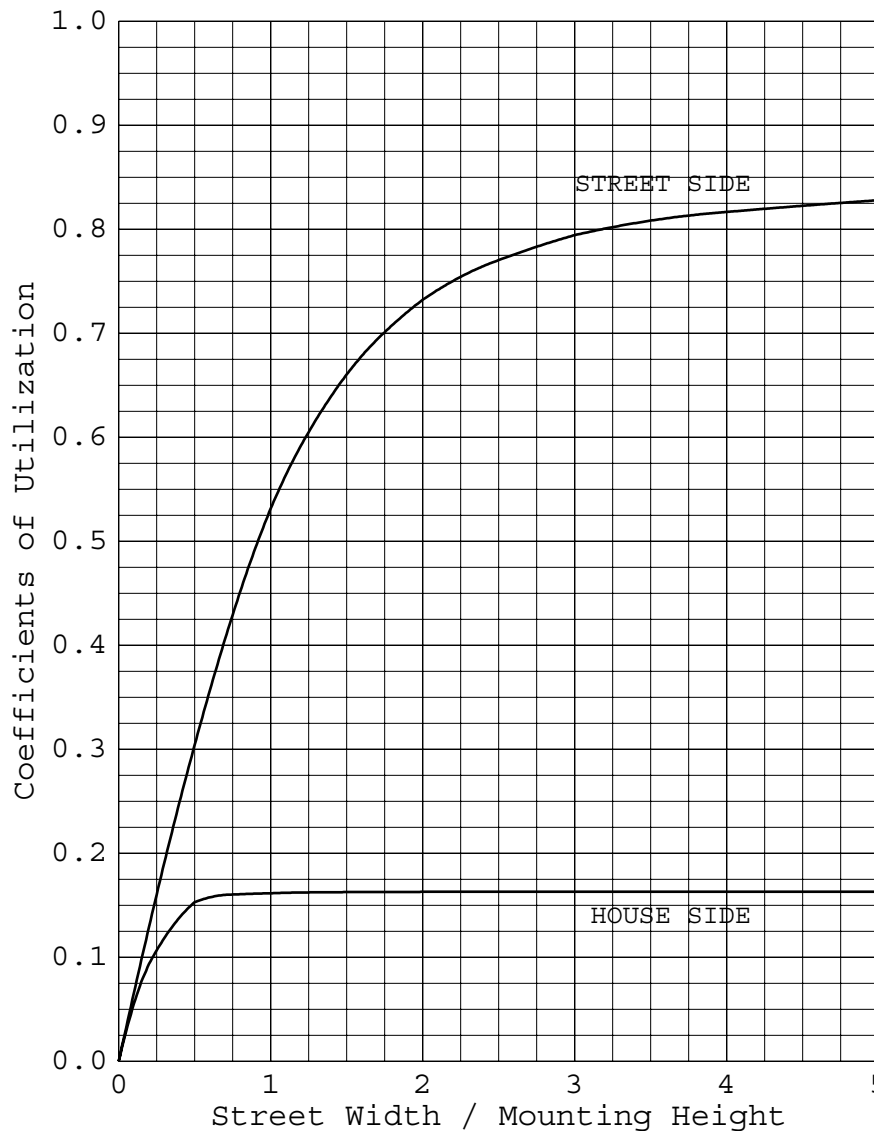




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PAGE: 3 OF 8

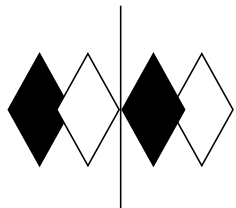
COEFFICIENTS OF UTILIZATION AND FLUX DISTRIBUTION



	LUMENS	PERCENT OF FIXTURE
DOWNWARD STREET SIDE	890	83.6
DOWNWARD HOUSE SIDE	174	16.3
DOWNWARD TOTAL	1063	100.0
UPWARD STREET SIDE	0	0.0
UPWARD HOUSE SIDE	0	0.0
UPWARD TOTAL	0	0.0
TOTAL FLUX	1063	100.0

EFFICACY = 71.8 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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4066 CAMELOT CIRCLE, LONGMONT, CO 80504 USA

REPORT NUMBER: ITL82639  
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PAGE: 4 OF 8

### 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	890.	83.6	
FL ( 0- 30)	202.9	19.1	
FM ( 30- 60)	473.4	44.5	
FH ( 60- 80)	204.8	19.3	G0
FVH( 80- 90)	8.4	0.8	G0
BACK LIGHT	174.	16.3	
BL ( 0- 30)	109.0	10.3	B0
BM ( 30- 60)	62.2	5.8	B0
BH ( 60- 80)	2.6	0.2	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	1063.	100.0	

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

BUG RATING: B0 U1 G0



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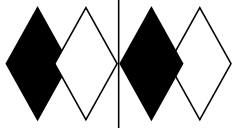
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PAGE: 5 OF 8

# CANDELA TABULATION

	STREET SIDE										
	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	2.	2.	2.	2.	1.	1.	0.	0.	0.	0.	0.
87.5	7.	7.	7.	6.	3.	2.	1.	1.	0.	0.	0.
85.0	13.	13.	12.	12.	9.	4.	2.	2.	1.	0.	0.
V 82.5	44.	43.	46.	52.	48.	11.	5.	3.	2.	1.	1.
E 80.0	112.	110.	113.	118.	114.	47.	11.	5.	3.	2.	1.
R 77.5	192.	189.	190.	187.	171.	117.	28.	10.	5.	3.	2.
T 75.0	268.	263.	260.	238.	207.	164.	79.	22.	9.	5.	3.
I 72.5	306.	303.	293.	272.	243.	198.	141.	60.	17.	8.	6.
C 70.0	343.	339.	331.	313.	284.	232.	176.	110.	43.	14.	9.
A 67.5	384.	381.	372.	354.	324.	265.	205.	148.	82.	30.	17.
L 65.0	424.	422.	413.	393.	358.	296.	233.	176.	115.	54.	33.
62.5	460.	459.	447.	426.	385.	322.	262.	202.	141.	78.	52.
A 60.0	487.	485.	472.	448.	405.	346.	288.	228.	167.	103.	74.
N 57.5	504.	503.	489.	462.	421.	368.	312.	254.	194.	128.	99.
G 55.0	515.	512.	498.	471.	434.	387.	335.	280.	220.	155.	124.
L 52.5	520.	518.	505.	481.	448.	405.	357.	303.	245.	182.	150.
E 50.0	524.	523.	511.	489.	460.	421.	377.	327.	269.	207.	176.
47.5	529.	528.	517.	497.	471.	435.	394.	346.	292.	232.	202.
45.0	535.	534.	523.	505.	480.	448.	410.	366.	314.	255.	227.
42.5	540.	539.	529.	512.	489.	459.	424.	383.	334.	277.	250.
40.0	544.	543.	535.	519.	497.	469.	437.	399.	352.	299.	273.
37.5	548.	547.	539.	524.	503.	477.	448.	412.	370.	320.	295.
35.0	551.	550.	542.	527.	507.	484.	457.	424.	385.	339.	316.
32.0<<	552.	551.	543.	529.	511.	490.	465.	436.	399.	359.	338.
30.0	551.	550.	543.	530.	513.	493.	470.	442.	408.	371.	351.
25.0	547.	546.	540.	529.	514.	498.	478.	454.	427.	397.	381.
20.0	538.	537.	532.	523.	511.	496.	480.	460.	438.	416.	403.
15.0	524.	523.	519.	511.	501.	489.	476.	461.	445.	429.	420.
10.0	503.	503.	499.	493.	485.	476.	467.	457.	447.	437.	430.
5.0	477.	477.	474.	470.	465.	460.	456.	451.	445.	440.	437.
0.0	441.	441.	441.	441.	441.	441.	441.	441.	441.	441.	441.
	PLANE OF MAXIMUM CANDELA										
	CONE OF MAXIMUM CANDELA										



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PAGE: 6 OF 8

# 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	2.	1.	0.	0.	0.	0.	0.	0.	0.	0.
I 72.5	4.	2.	1.	0.	0.	0.	0.	0.	0.	0.
C 70.0	7.	3.	1.	1.	0.	0.	0.	0.	0.	0.
A 67.5	10.	5.	2.	1.	1.	1.	1.	0.	0.	0.
L 65.0	17.	8.	3.	2.	1.	1.	1.	1.	1.	1.
62.5	30.	10.	4.	3.	2.	2.	1.	1.	1.	1.
A 60.0	47.	14.	6.	3.	3.	2.	2.	2.	2.	1.
N 57.5	69.	23.	9.	4.	4.	3.	3.	2.	2.	2.
G 55.0	94.	38.	12.	6.	4.	4.	3.	3.	3.	3.
L 52.5	120.	58.	16.	8.	5.	5.	4.	4.	4.	4.
E 50.0	146.	80.	26.	13.	7.	6.	5.	5.	4.	4.
47.5	171.	104.	43.	16.	9.	7.	6.	6.	5.	5.
45.0	195.	129.	65.	20.	14.	9.	7.	7.	7.	7.
42.5	220.	154.	87.	34.	18.	12.	9.	8.	8.	8.
40.0	245.	180.	113.	55.	22.	18.	13.	10.	10.	9.
37.5	269.	206.	140.	81.	33.	22.	19.	15.	13.	13.
35.0	291.	231.	168.	108.	57.	28.	24.	21.	19.	20.
32.0<<	315.	259.	200.	142.	92.	51.	30.	27.	26.	26.
30.0	330.	278.	221.	166.	116.	76.	46.	34.	30.	30.
25.0	364.	320.	273.	225.	182.	144.	113.	96.	84.	85.
20.0	390.	356.	321.	283.	247.	218.	192.	176.	165.	165.
15.0	410.	387.	362.	335.	309.	288.	268.	257.	249.	250.
10.0	425.	410.	396.	380.	366.	352.	340.	333.	328.	329.
5.0	434.	428.	421.	415.	410.	405.	400.	397.	395.	395.
0.0	441.	441.	441.	441.	441.	441.	441.	441.	441.	441.

CONE OF MAXIMUM CANDELA



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PAGE: 7 OF 8

5-DEGREE  
ZONAL LUMEN SUMMARY

0- 5	10
5- 10	31
10- 15	49
15- 20	64
20- 25	75
25- 30	83
30- 35	88
35- 40	92
40- 45	93
45- 50	92
50- 55	89
55- 60	83
60- 65	75
65- 70	61
70- 75	45
75- 80	27
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	41
0- 20	154
0- 30	312
0- 40	492
0- 50	676
0- 60	848
0- 70	983
0- 80	1055
0- 90	1063
0-100	1063
0-110	1063
0-120	1063
0-130	1063
0-140	1063
0-150	1063
0-160	1063
0-170	1063
0-180	1063



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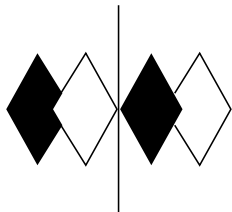
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ADDRESS: 170 LUDLOW AVE  
NORTHVALE, NJ 07647

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REPORT NUMBER: ITL82645  
DATE: 09/08/14  
PREPARED FOR: RAB LIGHTING, INC.  
CATALOG NUMBER: WPLED13N (WALLPACK) - ALED13N (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<sub>a</sub>,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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DATE:

09/08/14

PREPARED FOR:

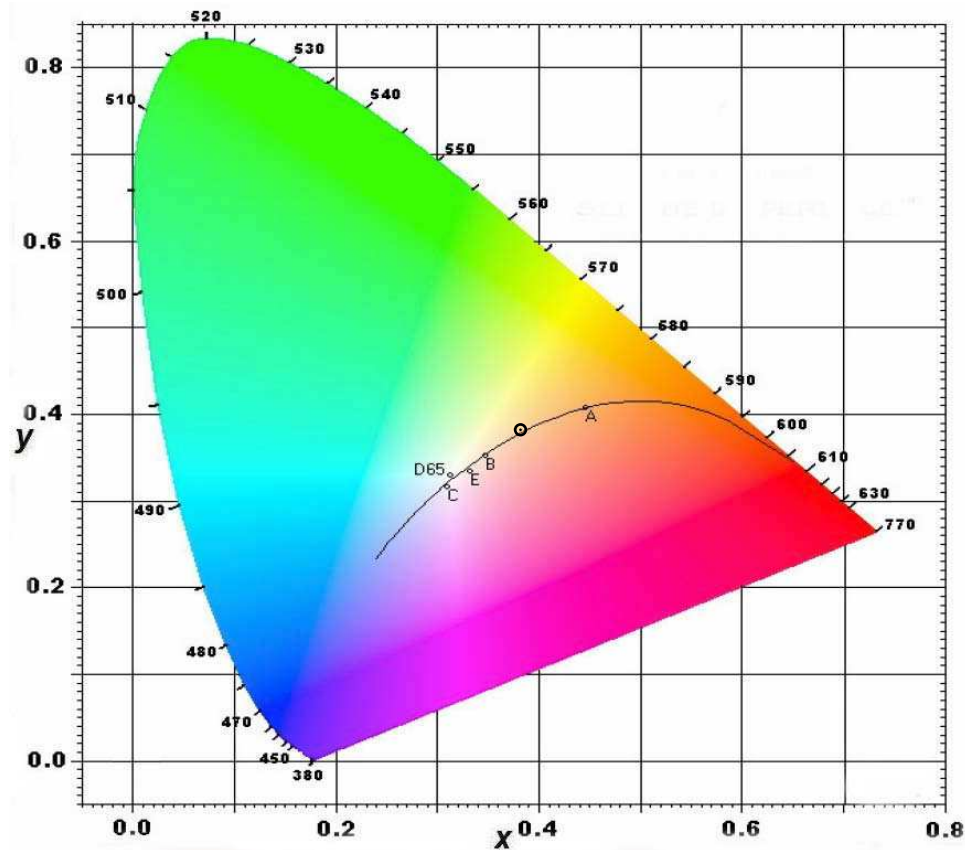
RAB LIGHTING, INC.

CATALOG NUMBER:

WPLED13N (WALLPACK) - ALED13N (AREA LIGHTER)

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## CIE Chromaticity Diagram





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 REPORT NUMBER: ITL82645  
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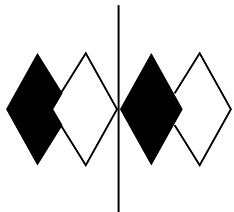
# RESULTS:

SPECTRORADIOMETRIC	
Observer	CIE 1931 2 degree
Chromaticity Ordinate x	0.3817
Chromaticity Ordinate y	0.3817
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2239
Chromaticity Ordinate v'	0.5039
Correlated Color Temp CCT (K)	4003
ANSI C78.377-2008 Duv	0.002
Total Radiant Flux (milliWatts)	3246 *
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 (%)	12.3
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)	15.5
Input Power Factor (%)	96.5
Input Current THD (%)	15.8
Input Voltage THD (%)	0.1

COLOR RENDERING INDICES	CRI
Ra (Average 1-8)	83
R1 Light greyish red	82
R2 Dark greyish yellow	87
R3 Strong yellowish green	92
R4 Moderate yellowish green	84
R5 Light bluish green	81
R6 Light blue	83
R7 Light violet	87
R8 Light reddish purple	67
R9 Strong red	11
R10 Strong yellow	70
R11 Strong green	83
R12 Strong blue	60
R13 Light yellowish pink (skin)	83
R14 Moderate olive green (leaf)	96

## \*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 LAB CODE: 200925-0

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RESULTS:

Wavelength	mW per nm	Wavelength	mW per nm	Wavelength	mW per nm
380	0.085	515	12.106	650	9.738
385	0.092	520	12.997	655	8.746
390	0.103	525	13.600	660	7.812
395	0.124	530	14.021	665	6.952
400	0.157	535	14.274	670	6.160
405	0.254	540	14.476	675	5.438
410	0.393	545	14.665	680	4.784
415	0.634	550	14.882	685	4.192
420	1.105	555	15.149	690	3.671
425	1.949	560	15.491	695	3.213
430	3.399	565	15.918	700	2.810
435	5.714	570	16.418	705	2.444
440	9.267	575	16.910	710	2.129
445	14.830	580	17.366	715	1.853
450	19.334	585	17.766	720	1.611
455	17.224	590	18.042	725	1.403
460	11.843	595	18.153	730	1.221
465	8.565	600	18.065	735	1.063
470	6.513	605	17.788	740	0.926
475	4.993	610	17.319	745	0.805
480	4.447	615	16.677	750	0.701
485	4.681	620	15.872	755	0.613
490	5.391	625	14.938	760	0.537
495	6.568	630	13.940	765	0.472
500	8.050	635	12.893	770	0.414
505	9.587	640	11.840	775	0.363
510	10.963	645	10.779	780	0.321

