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THE LIGHT CENTER OF THE INDUSTRY SINCE 1955

PHONE: (303) 442-1255

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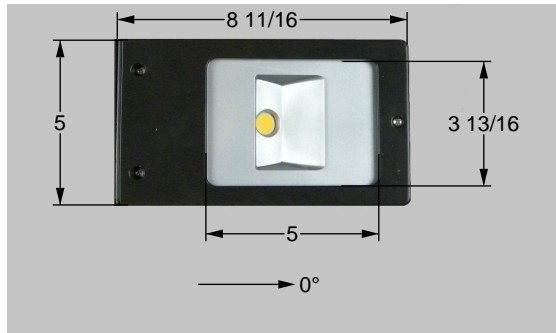
WEBSITE: www.itlboulder.com

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: ITL82635

ISSUE DATE: 09/02/14

PAGE: 1 OF 8

PREPARED FOR: RAB LIGHTING, INC.

CATALOG NUMBER: WPLED10Y (WALLPACK) -
ALED10Y (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.

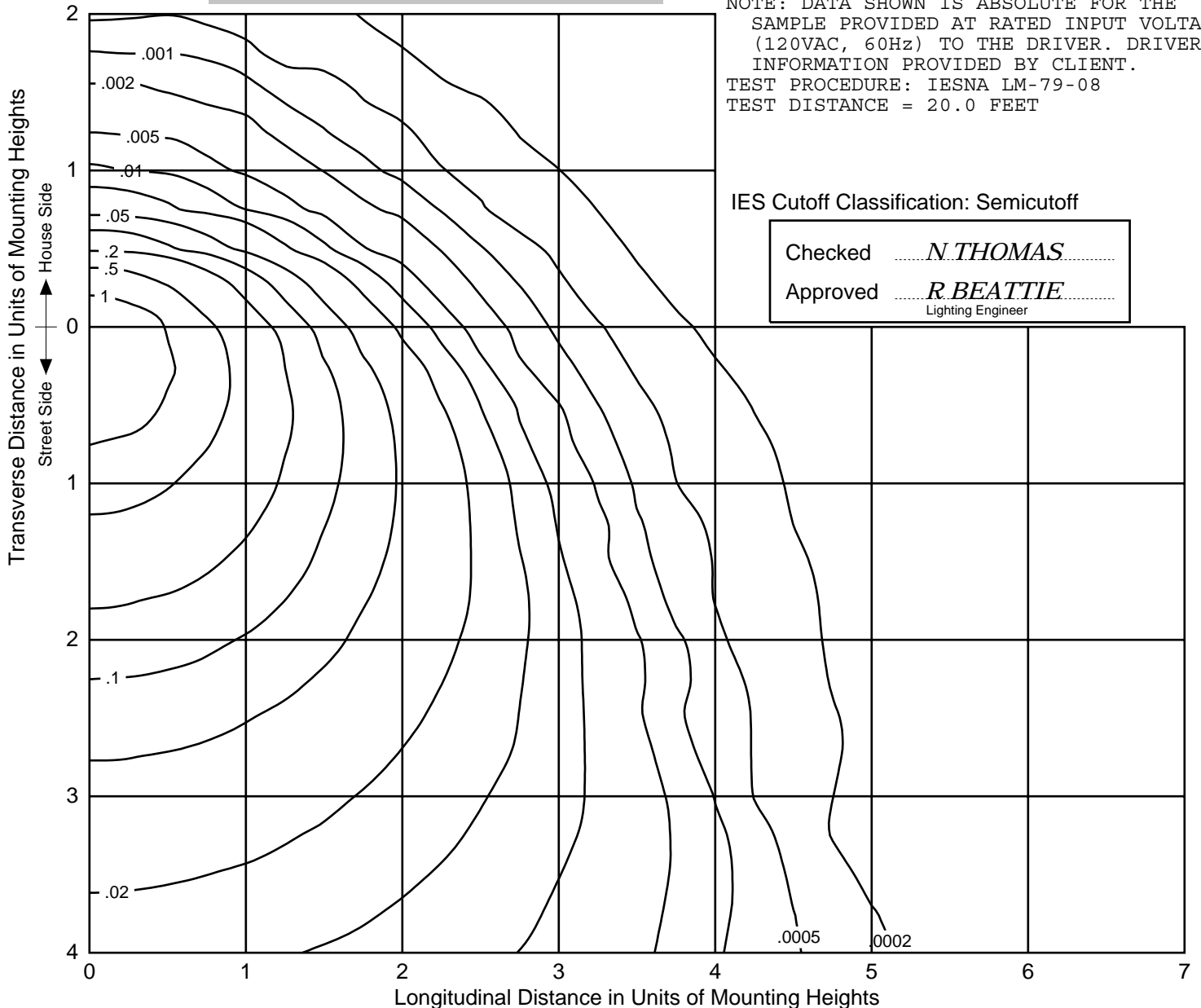
LAMP: ONE WHITE MULTI-CHIP LIGHT
EMITTING DIODE (LED), TILTED 30-
DEGREES FROM VERTICAL BASE-UP
POSITION.

TOTAL INPUT WATTS = 12.0 AT 120.0 VOLTS
LED DRIVER: RAB LIGHTING RD113-36-C0280

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



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CATALOG NUMBER: WPLED10Y (WALLPACK) -

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LUMINAIRE: CAST METAL HOUSING, ONE
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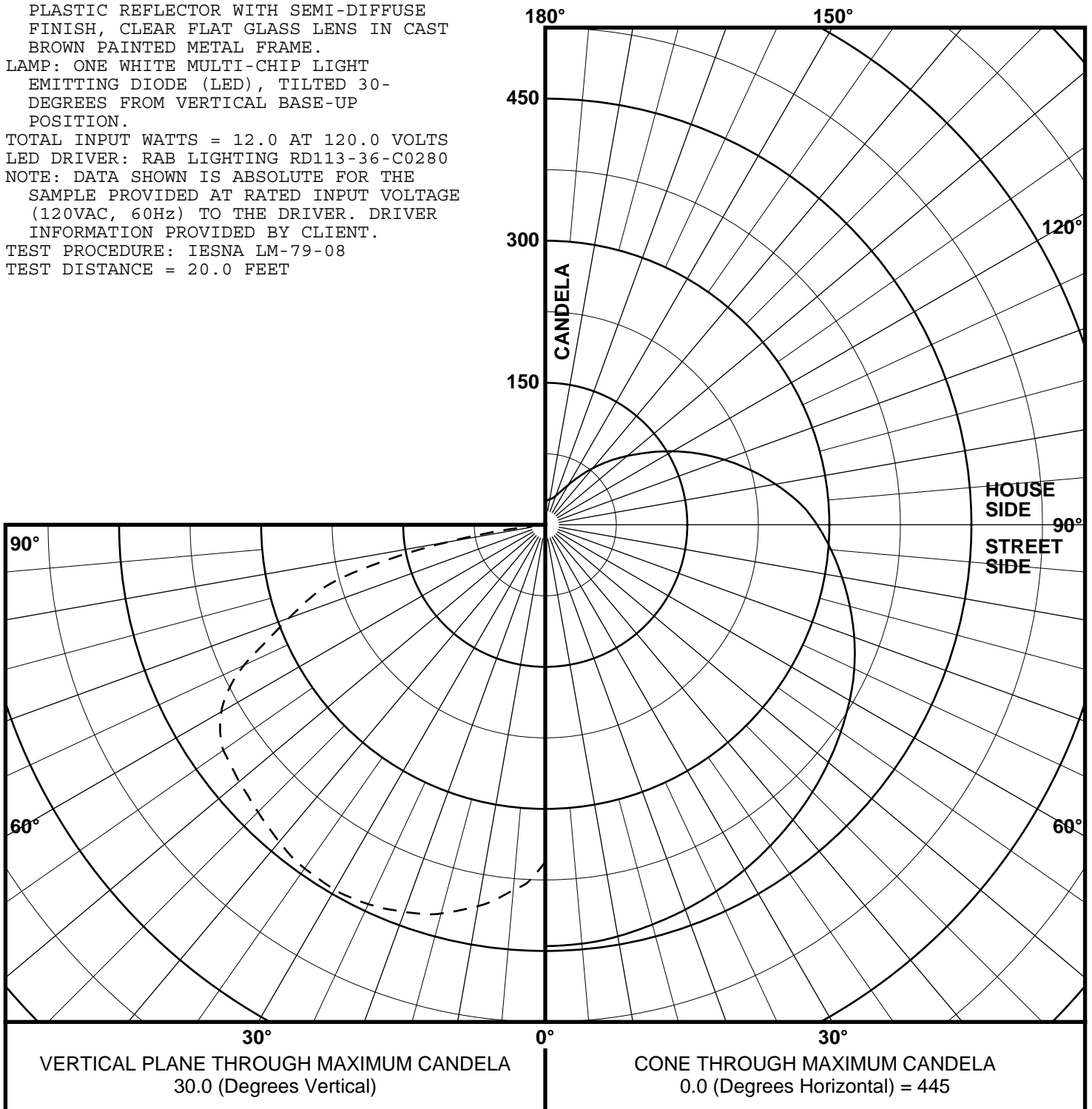
TOTAL INPUT WATTS = 12.0 AT 120.0 VOLTS
LED DRIVER: RAB LIGHTING RD113-36-C0280

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

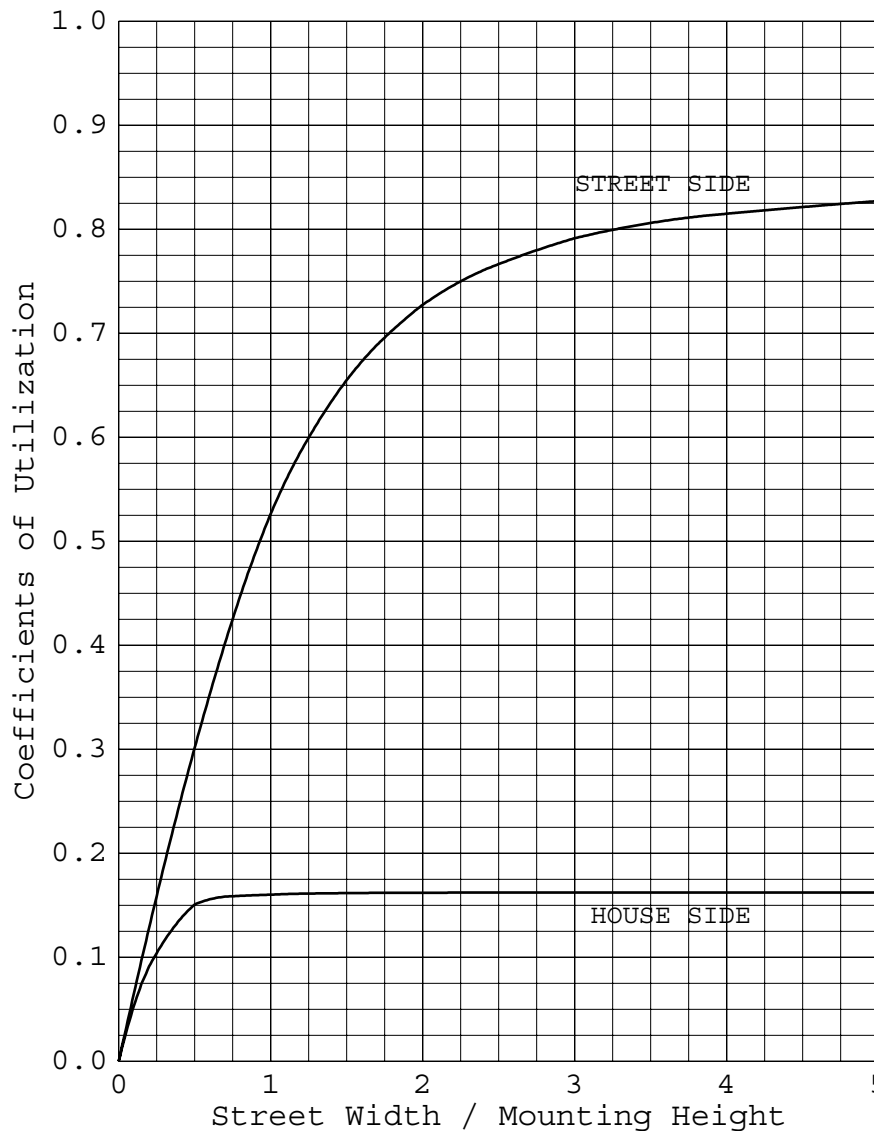




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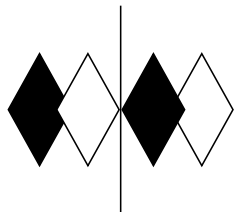
COEFFICIENTS OF UTILIZATION AND FLUX DISTRIBUTION



	LUMENS	PERCENT OF FIXTURE
DOWNWARD STREET SIDE	734	83.7
DOWNWARD HOUSE SIDE	143	16.3
DOWNWARD TOTAL	876	100.0
UPWARD STREET SIDE	0	0.0
UPWARD HOUSE SIDE	0	0.0
UPWARD TOTAL	0	0.0
TOTAL FLUX	876	100.0

EFFICACY = 73.0 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	734.	83.7	
FL (0- 30)	164.2	18.7	
FM (30- 60)	386.3	44.1	
FH (60- 80)	174.9	20.0	G0
FVH(80- 90)	8.2	0.9	G0
BACK LIGHT	143.	16.3	
BL (0- 30)	87.7	10.0	B0
BM (30- 60)	52.4	6.0	B0
BH (60- 80)	2.6	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	876.	100.0	

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

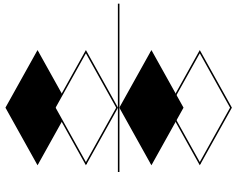
BUG RATING: B0 U1 G0

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CANDELA TABULATION

	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	2.	2.	2.	2.	1.	1.	0.	0.	0.	0.	0.
	87.5	7.	7.	6.	6.	3.	2.	1.	1.	0.	0.	0.
	85.0	12.	12.	12.	13.	10.	4.	2.	2.	1.	0.	0.
V	82.5	46.	44.	49.	51.	49.	10.	5.	3.	2.	1.	0.
E	80.0	105.	102.	107.	108.	104.	45.	9.	5.	3.	2.	1.
R	77.5	171.	170.	169.	167.	151.	105.	26.	9.	5.	3.	2.
T	75.0	230.	229.	223.	207.	179.	144.	77.	19.	8.	4.	3.
I	72.5	262.	261.	251.	233.	209.	171.	125.	55.	16.	7.	5.
C	70.0	288.	289.	279.	265.	242.	200.	153.	96.	42.	12.	8.
A	67.5	317.	318.	310.	299.	274.	227.	178.	129.	74.	28.	16.
L	65.0	351.	350.	342.	329.	303.	252.	201.	152.	101.	50.	31.
	62.5	377.	376.	367.	351.	324.	273.	222.	174.	123.	70.	47.
A	60.0	395.	394.	385.	368.	339.	291.	243.	195.	145.	91.	66.
N	57.5	407.	406.	397.	377.	349.	307.	263.	216.	165.	112.	86.
G	55.0	415.	413.	403.	383.	358.	322.	281.	235.	186.	133.	107.
L	52.5	418.	417.	407.	389.	366.	335.	297.	254.	206.	153.	129.
E	50.0	422.	420.	411.	395.	374.	347.	312.	271.	225.	173.	149.
	47.5	425.	424.	416.	401.	381.	357.	326.	288.	243.	193.	169.
	45.0	429.	428.	420.	407.	389.	366.	337.	302.	260.	213.	189.
	42.5	433.	432.	425.	412.	395.	373.	347.	315.	275.	231.	207.
	40.0	437.	436.	429.	417.	401.	380.	356.	327.	290.	248.	225.
	37.5	441.	439.	433.	421.	405.	386.	364.	337.	303.	264.	243.
	35.0	443.	442.	435.	424.	409.	391.	370.	346.	314.	278.	258.
	32.5	444.	443.	437.	426.	411.	395.	376.	353.	325.	291.	273.
	30.0<<	445.	444.	437.	427.	414.	399.	381.	360.	333.	303.	287.
	25.0	442.	441.	435.	426.	415.	402.	387.	369.	347.	322.	310.
	20.0	435.	435.	430.	421.	412.	401.	388.	373.	356.	337.	327.
	15.0	425.	424.	419.	412.	404.	396.	386.	374.	361.	347.	340.
	10.0	409.	408.	404.	398.	392.	386.	379.	371.	363.	353.	349.
	5.0	387.	386.	384.	379.	375.	372.	369.	365.	361.	356.	353.
	0.0	356.	356.	356.	356.	356.	356.	356.	356.	356.	356.	356.
		PLANE OF MAXIMUM CANDELA										
		CONE OF MAXIMUM CANDELA										



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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.
	175.0	0.	0.	0.	0.	0.	0.	0.	0.	0.
	165.0	0.	0.	0.	0.	0.	0.	0.	0.	0.
	155.0	0.	0.	0.	0.	0.	0.	0.	0.	0.
	145.0	0.	0.	0.	0.	0.	0.	0.	0.	0.
	135.0	0.	0.	0.	0.	0.	0.	0.	0.	0.
	125.0	0.	0.	0.	0.	0.	0.	0.	0.	0.
	115.0	0.	0.	0.	0.	0.	0.	0.	0.	0.
	105.0	0.	0.	0.	0.	0.	0.	0.	0.	0.
	95.0	0.	0.	0.	0.	0.	0.	0.	0.	0.
	92.5	0.	0.	0.	0.	0.	0.	0.	0.	0.
	90.0	0.	0.	0.	0.	0.	0.	0.	0.	0.
	87.5	0.	0.	0.	0.	0.	0.	0.	0.	0.
	85.0	0.	0.	0.	0.	0.	0.	0.	0.	0.
V	82.5	0.	0.	0.	0.	0.	0.	0.	0.	0.
E	80.0	1.	0.	0.	0.	0.	0.	0.	0.	0.
R	77.5	1.	0.	0.	0.	0.	0.	0.	0.	0.
T	75.0	2.	1.	1.	0.	0.	0.	0.	0.	0.
I	72.5	3.	2.	1.	1.	0.	0.	0.	0.	0.
C	70.0	6.	2.	2.	1.	1.	1.	0.	0.	0.
A	67.5	9.	4.	2.	2.	1.	1.	1.	1.	1.
L	65.0	16.	7.	3.	2.	2.	1.	1.	1.	1.
	62.5	28.	9.	4.	3.	2.	2.	2.	1.	1.
A	60.0	44.	13.	6.	4.	3.	3.	2.	2.	2.
N	57.5	62.	21.	9.	5.	4.	3.	3.	3.	3.
G	55.0	82.	33.	11.	6.	5.	4.	4.	3.	3.
L	52.5	102.	49.	15.	8.	6.	5.	4.	4.	4.
E	50.0	122.	68.	23.	12.	7.	6.	6.	5.	5.
	47.5	142.	87.	38.	15.	9.	7.	7.	6.	6.
	45.0	163.	106.	54.	19.	13.	9.	8.	7.	7.
	42.5	183.	126.	73.	29.	17.	12.	9.	8.	8.
	40.0	202.	146.	93.	46.	20.	16.	12.	10.	10.
	37.5	220.	167.	114.	66.	29.	20.	17.	14.	13.
	35.0	237.	187.	135.	87.	47.	24.	21.	19.	18.
	32.5	254.	206.	157.	109.	70.	38.	25.	23.	22.
	30.0<<	269.	224.	178.	133.	95.	62.	39.	29.	26.
	25.0	295.	258.	219.	180.	146.	116.	93.	76.	70.
	20.0	315.	287.	256.	226.	197.	174.	155.	140.	134.
	15.0	331.	311.	289.	267.	247.	230.	216.	205.	201.
	10.0	343.	331.	317.	304.	291.	281.	273.	266.	264.
	5.0	351.	345.	339.	333.	328.	324.	321.	319.	317.
	0.0	356.	356.	356.	356.	356.	356.	356.	356.	356.

CONE OF MAXIMUM CANDELA



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5-DEGREE
ZONAL LUMEN SUMMARY

0- 5	8
5- 10	25
10- 15	39
15- 20	52
20- 25	61
25- 30	67
30- 35	71
35- 40	74
40- 45	76
45- 50	75
50- 55	73
55- 60	69
60- 65	63
65- 70	52
70- 75	39
75- 80	24
80- 85	7
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	33
0- 20	124
0- 30	252
0- 40	398
0- 50	548
0- 60	691
0- 70	805
0- 80	868
0- 90	876
0-100	876
0-110	876
0-120	876
0-130	876
0-140	876
0-150	876
0-160	876
0-170	876
0-180	876



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PAGE: 8 OF 8

ADDRESS: 170 LUDLOW AVE
NORTHVALE, NJ 07647

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REPORT NUMBER: ITL82641
DATE: 09/08/14
PREPARED FOR: RAB LIGHTING, INC.
CATALOG NUMBER: WPLED10Y (WALLPACK) - ALED10Y (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-C0280

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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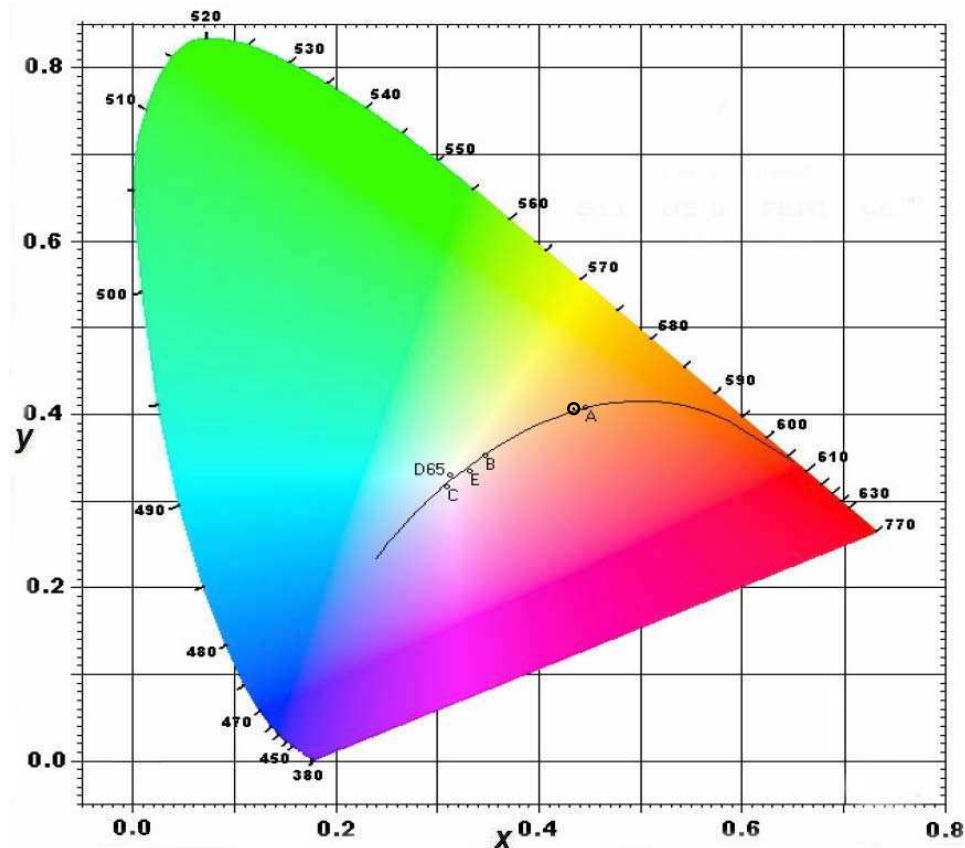
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CIE Chromaticity Diagram





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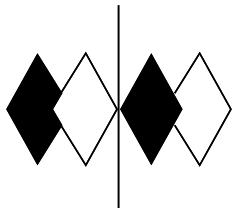
RESULTS:

SPECTRORADIOMETRIC	
Observer	CIE 1931 2 degree
Chromaticity Ordinate x	0.4341
Chromaticity Ordinate y	0.4061
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2479
Chromaticity Ordinate v'	0.5218
Correlated Color Temp CCT (K)	3065
ANSI C78.377-2008 Duv	0.001
Total Radiant Flux (milliWatts)	2659 *
ELECTRICAL	
Input Voltage (Volts AC)	120.0
Input Current (Amps AC)	0.101
Input Power (Watts)	12.0
Input Power Factor (%)	99.0
Input Current THD (%)	9.9
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)	0.050
Input Power (Watts)	13.1
Input Power Factor (%)	94.6
Input Current THD (%)	14.9
Input Voltage THD (%)	0.1

COLOR RENDERING INDICES	CRI
Ra (Average 1-8)	83
R1 Light greyish red	81
R2 Dark greyish yellow	89
R3 Strong yellowish green	96
R4 Moderate yellowish green	82
R5 Light bluish green	81
R6 Light blue	87
R7 Light violet	84
R8 Light reddish purple	60
R9 Strong red	7
R10 Strong yellow	75
R11 Strong green	82
R12 Strong blue	67
R13 Light yellowish pink (skin)	82
R14 Moderate olive green (leaf)	98

*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: WPLED10Y (WALLPACK) - ALED10Y (AREA LIGHTER)

RESULTS:

Wavelength	mW per nm	Wavelength	mW per nm	Wavelength	mW per nm
380	0.056	515	8.231	650	10.268
385	0.056	520	8.913	655	9.237
390	0.062	525	9.409	660	8.265
395	0.071	530	9.803	665	7.361
400	0.086	535	10.096	670	6.521
405	0.131	540	10.367	675	5.751
410	0.196	545	10.672	680	5.052
415	0.302	550	11.047	685	4.426
420	0.513	555	11.503	690	3.865
425	0.897	560	12.084	695	3.376
430	1.570	565	12.792	700	2.942
435	2.680	570	13.611	705	2.552
440	4.597	575	14.466	710	2.216
445	7.803	580	15.319	715	1.921
450	10.003	585	16.122	720	1.664
455	8.438	590	16.809	725	1.442
460	5.916	595	17.285	730	1.251
465	4.456	600	17.532	735	1.083
470	3.426	605	17.547	740	0.940
475	2.757	610	17.322	745	0.815
480	2.606	615	16.868	750	0.708
485	2.850	620	16.214	755	0.615
490	3.402	625	15.401	760	0.536
495	4.260	630	14.465	765	0.467
500	5.306	635	13.447	770	0.408
505	6.392	640	12.407	775	0.357
510	7.383	645	11.336	780	0.312

