



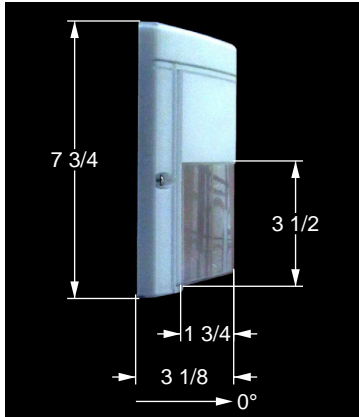
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THE LIGHT CENTER OF THE INDUSTRY SINCE 1955

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NVLAP LAB CODE: 200925-0

INDEPENDENT TESTING LABORATORIES, INC.
4066 CAMELOT CIRCLE, LONGMONT, CO 80504 USA

PHONE: (303) 442-1255 • FAX: (970) 535-3114 • E-MAIL: itl@itlboulder.com • WEBSITE: www.itlboulder.com

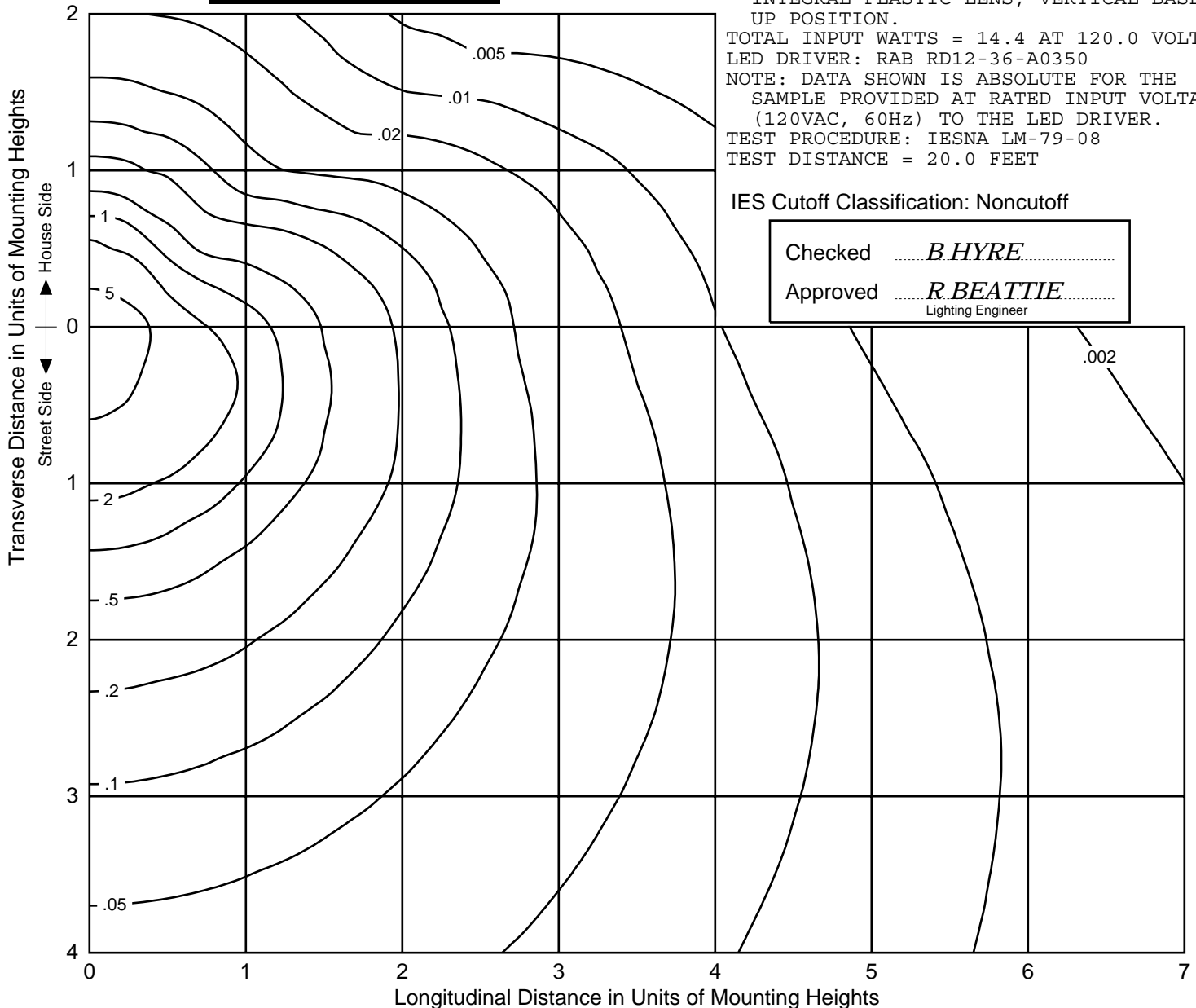
ISOFOOTCANDLE LINES OF HORIZONTAL ILLUMINATION
Values based on 8 foot mounting height.

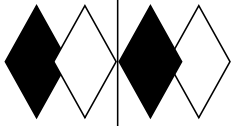


REPORT NUMBER: ITL76948
ISSUE DATE: 04/23/13 PAGE: 1 OF 8
PREPARED FOR: RAB LIGHTING, INC.
CATALOG NUMBER: ENTRA12
LUMINAIRE: CAST FINNED WHITE PAINTED METAL HOUSING, FORMED WHITE PAINTED METAL REAR REFLECTOR, MOLDED PLASTIC UPPER REFLECTOR WITH SPECULAR FINISH, 1 WHITE CIRCUIT BOARD WITH ONE 3X3 LED ARRAY, MOLDED CLEAR PLASTIC FRONT COVER WITH HOLOGRAPHIC LENSED SECTION AND WHITE PAINTED INTERIOR TOP, SIDE, AND LOWER SECTIONS. SIDE AND UPPER FRONT EXTERIOR SECTIONS ARE TEXTURED.
LAMPS: NINE WHITE LIGHT EMITTING DIODES (LEDS) WITH 1 CLEAR SEMI-HEMISPHERICAL INTEGRAL PLASTIC LENS, VERTICAL BASE-UP POSITION.
TOTAL INPUT WATTS = 14.4 AT 120.0 VOLTS
LED DRIVER: RAB RD12-36-A0350
NOTE: DATA SHOWN IS ABSOLUTE FOR THE SAMPLE PROVIDED AT RATED INPUT VOLTAGE (120VAC, 60Hz) TO THE LED DRIVER.
TEST PROCEDURE: IESNA LM-79-08
TEST DISTANCE = 20.0 FEET

IES Cutoff Classification: Noncutoff

Checked *B. HYRE*
Approved *R. BEATTIE*
Lighting Engineer





REPORT NUMBER: ITL76948
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 CATALOG NUMBER: ENTRA12

LUMINAIRE: CAST FINNED WHITE PAINTED
 METAL HOUSING, FORMED WHITE PAINTED
 METAL REAR REFLECTOR, MOLDED PLASTIC
 UPPER REFLECTOR WITH SPECULAR FINISH, 1
 WHITE CIRCUIT BOARD WITH ONE 3X3 LED
 ARRAY, MOLDED CLEAR PLASTIC FRONT COVER
 WITH HOLOGRAPHIC LENSED SECTION AND
 WHITE PAINTED INTERIOR TOP, SIDE, AND
 LOWER SECTIONS. SIDE AND UPPER FRONT
 EXTERIOR SECTIONS ARE TEXTURED.

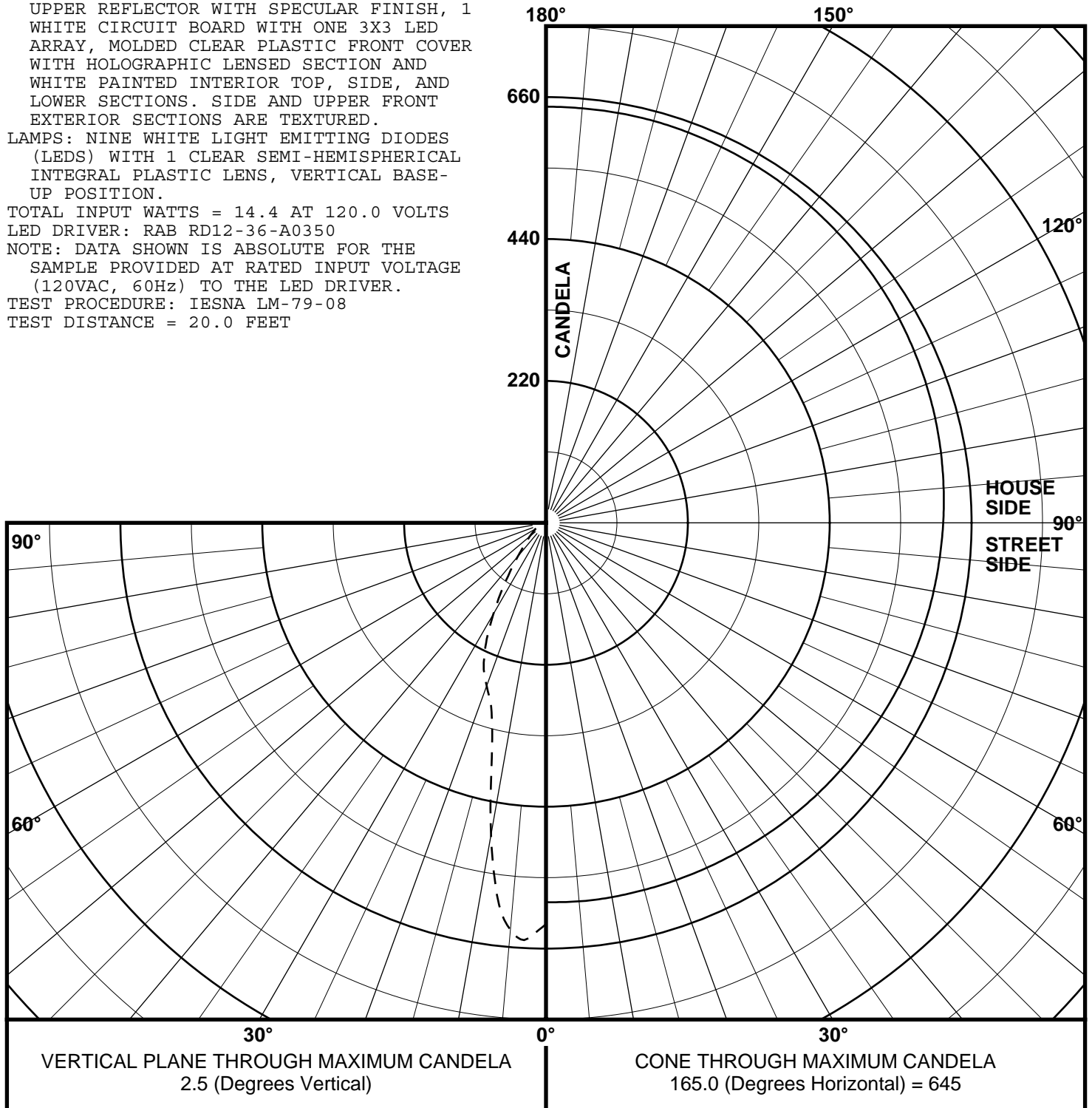
LAMPS: NINE WHITE LIGHT EMITTING DIODES
 (LEDS) WITH 1 CLEAR SEMI-HEMISPHERICAL
 INTEGRAL PLASTIC LENS, VERTICAL BASE-
 UP POSITION.

TOTAL INPUT WATTS = 14.4 AT 120.0 VOLTS
 LED DRIVER: RAB RD12-36-A0350

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

TEST PROCEDURE: IESNA LM-79-08
 TEST DISTANCE = 20.0 FEET

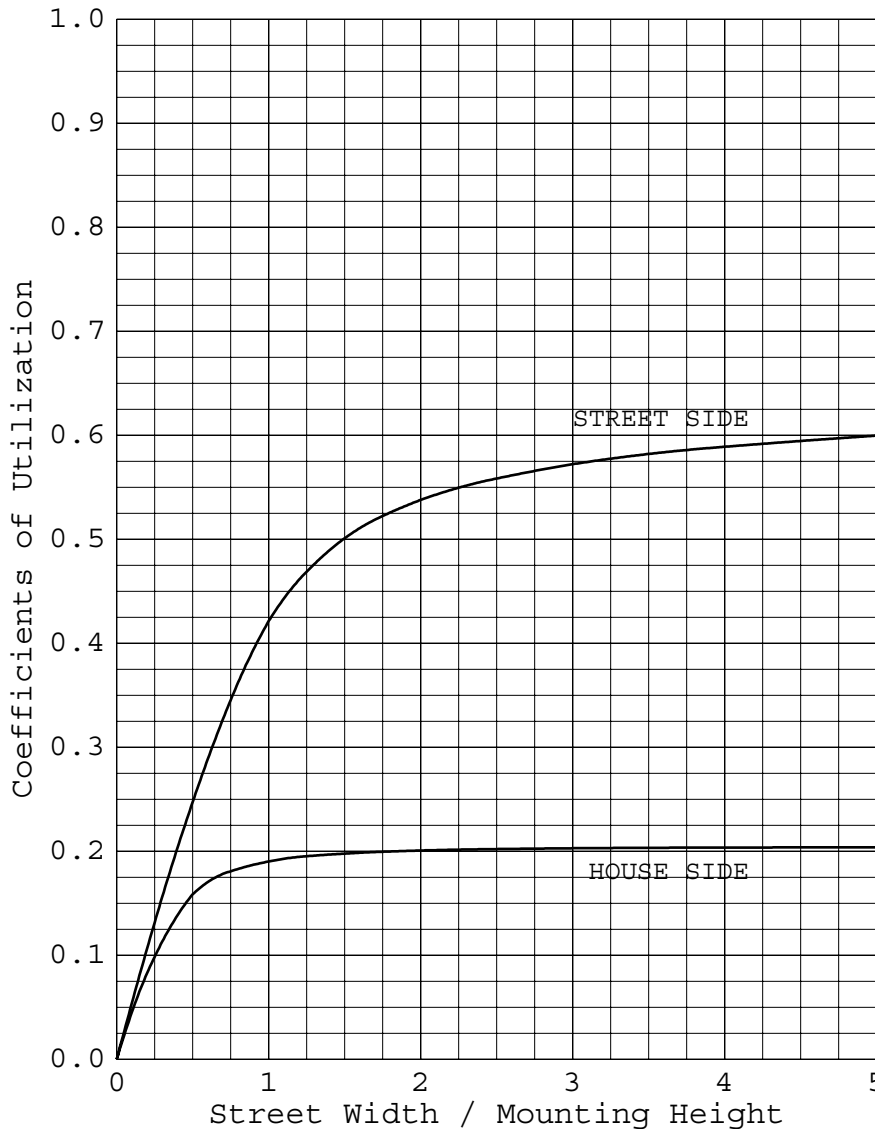
MAXIMUM PLANE AND MAXIMUM CONE PLOTS OF CANDELA



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COEFFICIENTS OF UTILIZATION AND FLUX DISTRIBUTION



	LUMENS	PERCENT OF FIXTURE
DOWNWARD STREET SIDE	824	64.2
DOWNWARD HOUSE SIDE	263	20.5
DOWNWARD TOTAL	1087	84.7
UPWARD STREET SIDE	188	14.6
UPWARD HOUSE SIDE	9	0.7
UPWARD TOTAL	196	15.3
TOTAL FLUX	1284	100.0

EFFICACY = 89.2 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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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	824.	64.2	
FL (0- 30)	189.3	14.7	
FM (30- 60)	412.7	32.1	
FH (60- 80)	159.5	12.4	G0
FVH(80- 90)	62.7	4.9	G1
BACK LIGHT	263.	20.5	
BL (0- 30)	140.3	10.9	B1
BM (30- 60)	95.3	7.4	B0
BH (60- 80)	24.1	1.9	B0 G0
BVH(80- 90)	3.5	0.3	G0
UPLIGHT	196.	15.3	
UL (90-100)	59.1	4.6	U3
UH (100-180)	137.2	10.7	U3
TRAPPED LIGHT	0.	0.0	
TOTAL FLUX	1284.	100.0	

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

BUG RATING: B1 U3 G1



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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.	
	175.0	0.	0.	0.	0.	1.	1.	1.	1.	1.	1.	
	165.0	9.	8.	8.	8.	8.	8.	7.	6.	6.	4.	
	155.0	22.	22.	21.	20.	18.	16.	14.	13.	11.	8.	
	145.0	36.	36.	35.	33.	30.	26.	22.	19.	15.	11.	
	135.0	55.	55.	53.	49.	44.	38.	32.	26.	19.	14.	
	125.0	78.	78.	75.	70.	63.	54.	45.	35.	25.	17.	
	115.0	105.	104.	101.	94.	85.	74.	61.	48.	33.	20.	
	105.0	133.	132.	128.	120.	109.	94.	79.	61.	41.	24.	
	95.0	157.	156.	151.	142.	130.	114.	95.	74.	50.	29.	
	92.5	162.	161.	156.	146.	134.	117.	98.	77.	52.	30.	
	90.0	165.	164.	159.	150.	137.	120.	101.	79.	54.	31.	
	87.5	168.	167.	161.	152.	139.	122.	103.	81.	56.	33.	
	85.0	169.	169.	163.	154.	141.	125.	106.	84.	58.	36.	
V	82.5	171.	171.	165.	156.	143.	127.	108.	86.	61.	39.	
E	80.0	173.	173.	168.	158.	146.	130.	111.	90.	65.	43.	
R	77.5	176.	175.	170.	161.	149.	133.	116.	95.	71.	49.	
T	75.0	179.	178.	174.	165.	153.	138.	121.	102.	78.	57.	
I	72.5	183.	183.	178.	170.	158.	144.	129.	112.	88.	68.	
C	70.0	190.	189.	185.	178.	167.	154.	141.	125.	102.	82.	
A	67.5	201.	200.	196.	189.	178.	167.	157.	143.	119.	99.	
L	65.0	216.	215.	212.	205.	196.	186.	177.	165.	139.	119.	
	62.5	237.	236.	233.	227.	218.	209.	203.	191.	163.	141.	
A	60.0	264.	263.	260.	253.	245.	238.	233.	220.	188.	162.	
N	57.5	295.	294.	291.	284.	276.	270.	265.	250.	214.	184.	
G	55.0	328.	327.	323.	316.	308.	303.	297.	279.	240.	205.	
L	52.5	360.	359.	355.	348.	341.	336.	329.	308.	264.	224.	
E	50.0	391.	390.	386.	379.	371.	366.	358.	333.	286.	242.	
	47.5	418.	417.	413.	406.	399.	393.	384.	356.	306.	258.	
	45.0	442.	441.	436.	429.	421.	416.	406.	378.	328.	272.	
	42.5	462.	461.	456.	448.	439.	434.	426.	399.	346.	281.	
	40.0	481.	479.	472.	463.	454.	450.	443.	417.	354.	283.	
	37.5	494.	492.	484.	473.	466.	461.	452.	420.	350.	281.	
	35.0	501.	500.	489.	478.	470.	461.	447.	409.	342.	279.	
	30.0	504.	503.	490.	474.	459.	445.	425.	385.	327.	279.	
	25.0	498.	497.	485.	469.	453.	434.	407.	365.	321.	303.	
	20.0	497.	496.	487.	471.	452.	427.	397.	367.	353.	368.	
	15.0	521.	520.	511.	495.	473.	451.	431.	422.	431.	459.	
	10.0	549.	548.	542.	531.	519.	510.	507.	510.	523.	542.	
	5.0	569.	569.	568.	567.	567.	569.	573.	580.	587.	598.	
	2.5<<	588.	589.	589.	590.	592.	595.	598.	603.	608.	613.	
	0.0	622.	622.	622.	622.	622.	622.	622.	622.	622.	622.	

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.	0.
175.0	1.	1.	0.	0.	0.	0.	0.	0.	0.	0.
165.0	3.	2.	1.	1.	0.	0.	0.	0.	0.	0.
155.0	6.	4.	2.	1.	0.	0.	0.	0.	0.	0.
145.0	8.	5.	3.	1.	0.	0.	0.	0.	0.	0.
135.0	9.	6.	3.	1.	0.	0.	0.	0.	0.	0.
125.0	11.	7.	4.	1.	0.	0.	0.	0.	0.	0.
115.0	12.	8.	4.	1.	0.	0.	0.	0.	0.	0.
105.0	14.	9.	5.	1.	0.	0.	0.	0.	0.	0.
95.0	17.	12.	7.	2.	1.	0.	0.	0.	0.	0.
92.5	18.	13.	7.	2.	1.	0.	0.	0.	0.	0.
90.0	19.	14.	8.	2.	1.	0.	0.	0.	0.	0.
87.5	21.	15.	8.	3.	1.	0.	0.	0.	0.	0.
85.0	23.	17.	9.	3.	1.	1.	0.	0.	0.	0.
V 82.5	26.	19.	11.	4.	1.	1.	1.	1.	0.	0.
E 80.0	30.	23.	13.	5.	2.	2.	2.	2.	1.	1.
R 77.5	36.	27.	15.	6.	3.	3.	3.	3.	3.	3.
T 75.0	45.	33.	19.	8.	5.	5.	5.	5.	5.	5.
I 72.5	55.	40.	22.	10.	6.	7.	7.	7.	7.	7.
C 70.0	69.	50.	27.	12.	8.	9.	9.	9.	9.	9.
A 67.5	84.	60.	32.	14.	10.	11.	11.	11.	11.	11.
L 65.0	101.	71.	37.	16.	12.	13.	14.	14.	14.	14.
62.5	119.	82.	43.	19.	14.	15.	16.	16.	16.	16.
A 60.0	136.	93.	49.	22.	16.	17.	18.	19.	19.	18.
N 57.5	152.	104.	55.	24.	18.	20.	21.	21.	21.	21.
G 55.0	167.	114.	61.	28.	21.	23.	24.	24.	24.	24.
L 52.5	180.	123.	67.	31.	25.	26.	28.	28.	28.	28.
E 50.0	192.	131.	73.	36.	29.	31.	33.	33.	32.	32.
47.5	201.	138.	79.	41.	34.	36.	38.	38.	38.	38.
45.0	209.	144.	84.	47.	41.	44.	46.	46.	45.	45.
42.5	215.	151.	91.	55.	50.	53.	55.	55.	55.	55.
40.0	220.	157.	99.	64.	61.	65.	68.	68.	68.	68.
37.5	224.	165.	108.	76.	75.	80.	84.	85.	85.	85.
35.0	228.	176.	121.	90.	91.	99.	104.	106.	107.	107.
30.0	251.	220.	164.	128.	132.	145.	157.	163.	166.	166.
25.0	312.	306.	250.	195.	183.	195.	213.	226.	233.	233.
20.0	404.	419.	377.	310.	265.	252.	258.	269.	276.	277.
15.0	494.	515.	504.	461.	406.	362.	334.	323.	320.	319.
10.0	565.	582.	589.	582.	561.	537.	509.	491.	481.	477.
5.0	608.	618.	627.	634.	636.	636.	635.	633.	632.	631.
2.5<<	619.	625.	630.	635.	638.	641.	643.	645.	645.	645.
0.0	622.	622.	622.	622.	622.	622.	622.	622.	622.	622.

||
CONE OF MAXIMUM CANDELA

||
PLANE OF MAXIMUM CANDELA



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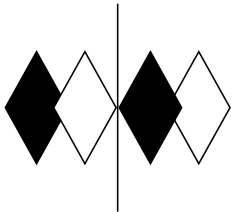
PAGE: 7 OF 8

5-DEGREE
ZONAL LUMEN SUMMARY

0- 5	15
5- 10	41
10- 15	57
15- 20	66
20- 25	72
25- 30	78
30- 35	84
35- 40	90
40- 45	92
45- 50	89
50- 55	82
55- 60	71
60- 65	59
65- 70	48
70- 75	41
75- 80	36
80- 85	34
85- 90	32
90- 95	31
95-100	28
100-105	26
105-110	23
110-115	19
115-120	16
120-125	13
125-130	11
130-135	9
135-140	7
140-145	5
145-150	4
150-155	2
155-160	2
160-165	1
165-170	0
170-175	0
175-180	0

10-DEGREE
ZONAL LUMEN SUMMARY

0- 10	55
0- 20	179
0- 30	330
0- 40	504
0- 50	685
0- 60	838
0- 70	944
0- 80	1021
0- 90	1087
0-100	1146
0-110	1194
0-120	1230
0-130	1254
0-140	1270
0-150	1278
0-160	1282
0-170	1284
0-180	1284



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NVLAP LAB CODE: 200925-0

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NORTHVALE, NJ 07647

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Page 1 of 4

REPORT NUMBER: ITL76954
DATE: 04/29/13
PREPARED FOR: RAB LIGHTING, INC.
CATALOG NUMBER: ENTRA12

ADDRESS: 170 LUDLOW AVE
NORTHVALE, NJ 07647

LUMINAIRE: CAST FINNED WHITE PAINTED METAL HOUSING, FORMED WHITE PAINTED METAL REAR REFLECTOR, MOLDED PLASTIC UPPER REFLECTOR WITH SPECULAR FINISH, 1 WHITE CIRCUIT BOARD WITH ONE 3X3 LED ARRAY, MOLDED CLEAR PLASTIC FRONT COVER WITH HOLOGRAPHIC LENSED SECTION AND WHITE PAINTED INTERIOR TOP, SIDE, AND LOWER SECTIONS. SIDE AND UPPER FRONT EXTERIOR SECTIONS ARE TEXTURED.

LAMP: NINE WHITE LIGHT EMITTING DIODES (LEDS) WITH 1 CLEAR SEMI-HEMISPHERICAL INTEGRAL PLASTIC LENS, VERTICAL BASE-UP POSITION.

DRIVER: RAB RD12-36-A0350

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

INSTRUMENTS:	Kikusui PCR500L AC Power Source	Calibration Due:
	Yokogawa WT210 Digital Power Meter #8	N/A
	Ocean Optics QE65000 Spectroradiometer	01/31/14
	ITL 1.5m Diameter Integrating Sphere S15-2, 4PI Geometry	03/14/14

OBJECT OF TEST: Measure the Total Radiant Flux*, Spectral Power Distribution (SPD), Correlated Color Temperature (CCT), Color Rendering Indices (CRIa,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.

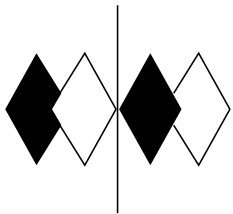
PROCEDURE: The test sample was provided by the customer and had an unknown number of operating hours. The test sample was mounted inside the integrating sphere and allowed to stabilize. After stabilization occurred, measurements were taken. In order to measure mean performance, multiple data sets were 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)

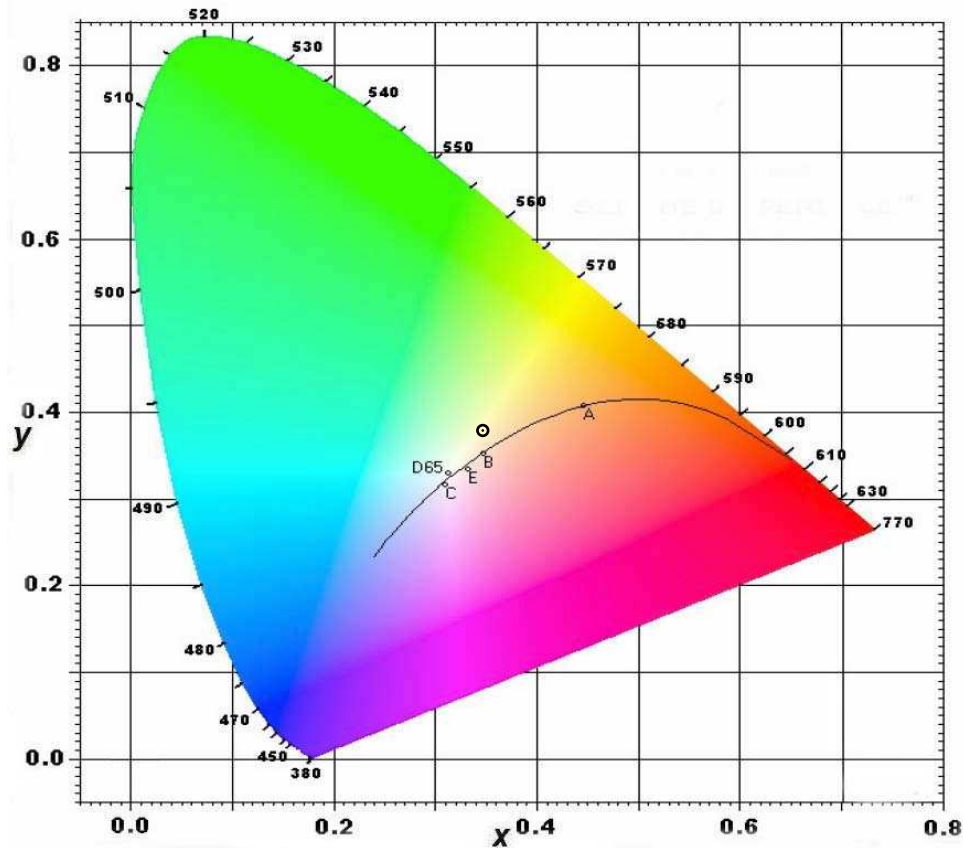
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Checked	<u>P O'CONNOR</u>
Approved	<u>L GRABA</u> Lighting Engineer



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CIE Chromaticity Diagram





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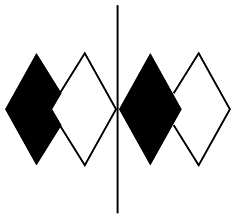
RESULTS:

SPECTRORADIOMETRIC	
Observer	CIE 1931 2 degree
Chromaticity Ordinate x	0.3465
Chromaticity Ordinate y	0.3786
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2023
Chromaticity Ordinate v'	0.4974
Correlated Color Temp CCT (K)	5033
ANSI C78.377-2008 Duv	0.012
Total Radiant Flux (milliWatts)	3734 *
ELECTRICAL	
Input Voltage (Volts AC)	120.0
Input Current (Amps AC)	0.121
Input Power (Watts)	14.3
Input Power Factor (%)	98.5
Input Current THD (%)	9.9
Input Voltage THD (%)	0.0
Off-State Power (Watts)	
	0.0
ELECTRICAL AT MAX NONIMAL INPUT	
Input Voltage (Volts AC)	277.0
Input Current (Amps AC)	0.063
Input Power (Watts)	15.3
Input Power Factor (%)	87.7
Input Current THD (%)	23.9
Input Voltage THD (%)	0.1

COLOR RENDERING INDICES	CRI
Ra (Average 1-8)	70
R1 Light greyish red	65
R2 Dark greyish yellow	74
R3 Strong yellowish green	81
R4 Moderate yellowish green	69
R5 Light bluish green	65
R6 Light blue	64
R7 Light violet	83
R8 Light reddish purple	55
R9 Strong red	-38
R10 Strong yellow	39
R11 Strong green	62
R12 Strong blue	33
R13 Light yellowish pink (skin)	66
R14 Moderate olive green (leaf)	89

*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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REPORT NUMBER: ITL76954
DATE: 04/29/13

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PREPARED FOR: RAB LIGHTING, INC.
CATALOG NUMBER: ENTRA12

RESULTS:

Wavelength	mW per nm	Wavelength	mW per nm	Wavelength	mW per nm
380	0.117	515	14.116	650	8.116
385	0.128	520	16.541	655	7.403
390	0.146	525	18.528	660	6.734
395	0.176	530	19.977	665	6.094
400	0.227	535	20.951	670	5.497
405	0.381	540	21.555	675	4.951
410	0.604	545	21.921	680	4.453
415	1.008	550	22.064	685	3.995
420	1.779	555	22.037	690	3.577
425	3.058	560	21.888	695	3.198
430	5.101	565	21.630	700	2.853
435	8.113	570	21.233	705	2.542
440	12.499	575	20.752	710	2.274
445	19.589	580	20.151	715	2.016
450	27.748	585	19.512	720	1.793
455	28.178	590	18.822	725	1.600
460	19.928	595	18.052	730	1.427
465	12.823	600	17.227	735	1.270
470	8.964	605	16.354	740	1.131
475	6.210	610	15.420	745	1.006
480	4.535	615	14.432	750	0.895
485	3.943	620	13.426	755	0.799
490	4.027	625	12.435	760	0.714
495	4.779	630	11.471	765	0.639
500	6.346	635	10.547	770	0.572
505	8.660	640	9.693	775	0.512
510	11.375	645	8.883	780	0.457

