

itl boulder
THE LIGHT CENTER OF THE INDUSTRY SINCE 1955

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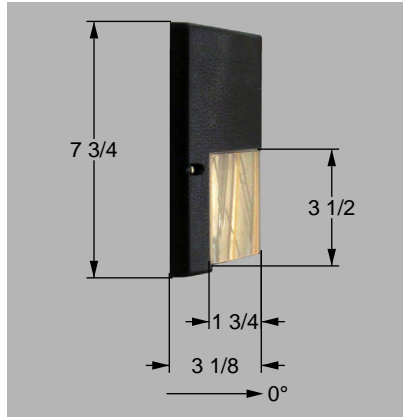
NVLAP
NVLAP LAB CODE: 200925-0

INDEPENDENT TESTING LABORATORIES, INC.

4066 CAMELOT CIRCLE, LONGMONT, CO 80504 USA

ISOFOOTCANDLE LINES OF HORIZONTAL ILLUMINATION

Values based on 8 foot mounting height.



REPORT NUMBER: ITL76949

ISSUE DATE: 04/25/13

PAGE: 1 OF 8

PREPARED FOR: RAB LIGHTING, INC.

CATALOG NUMBER: ENTRA12N

LUMINAIRE: CAST FINNED BROWN 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 BROWN 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 = 13.9 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.

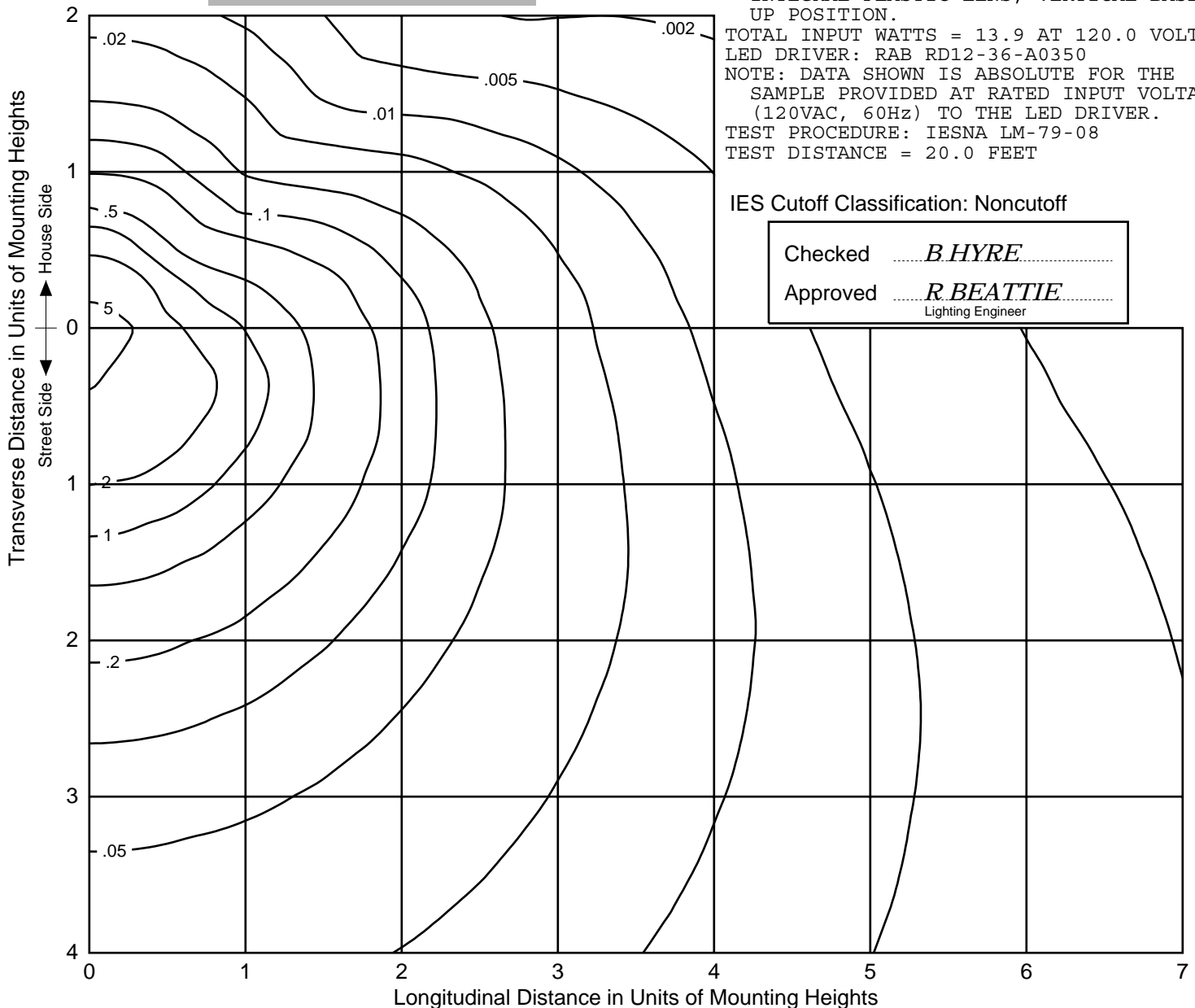
TEST PROCEDURE: IESNA LM-79-08

TEST DISTANCE = 20.0 FEET

IES Cutoff Classification: Noncutoff

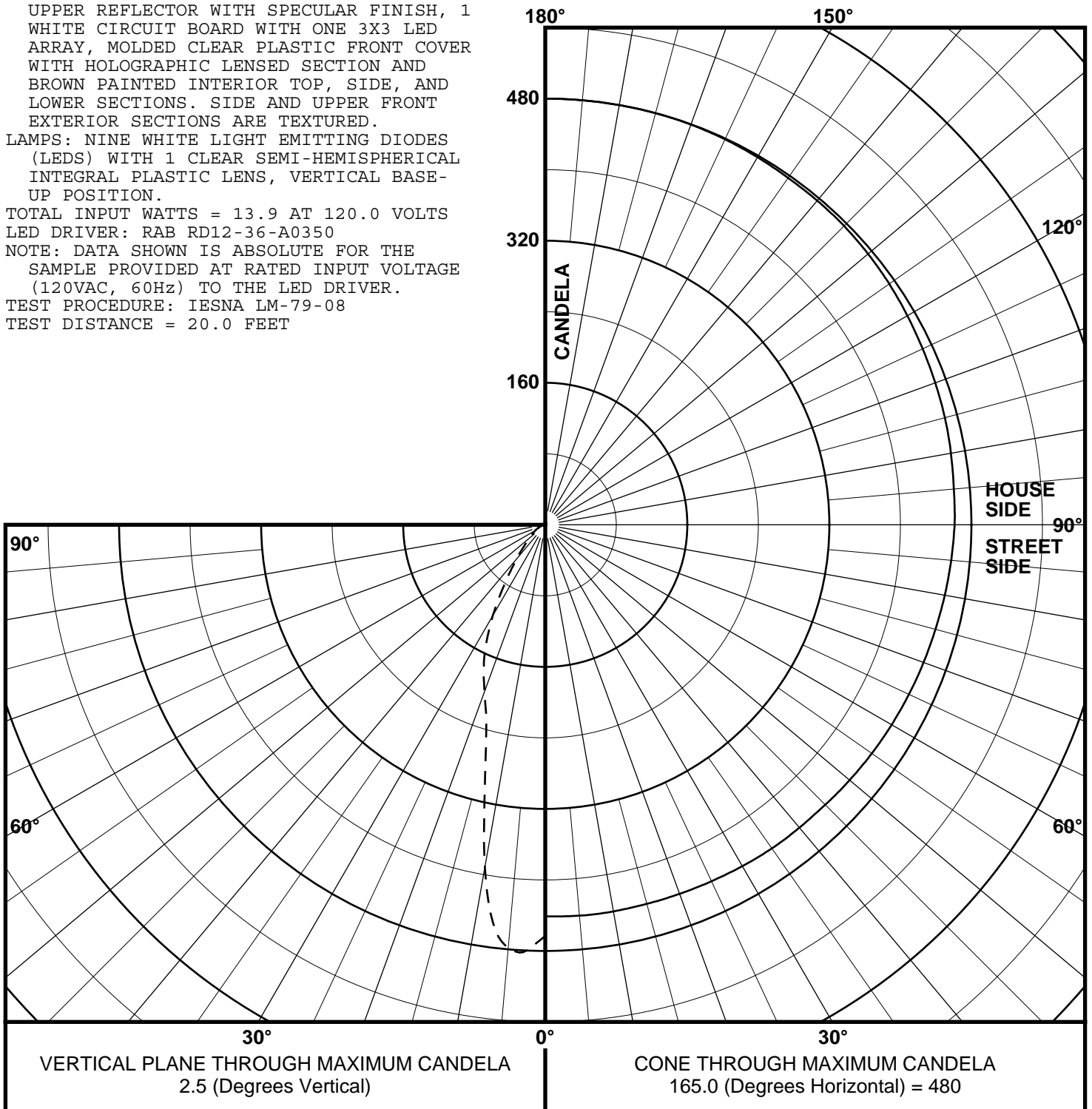
Checked B. HYRE

Approved R. BEATTIE
Lighting Engineer



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PREPARED FOR: RAB LIGHTING, INC.
CATALOG NUMBER: ENTRA12N
LUMINAIRE: CAST FINNED BROWN 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
BROWN 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 = 13.9 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

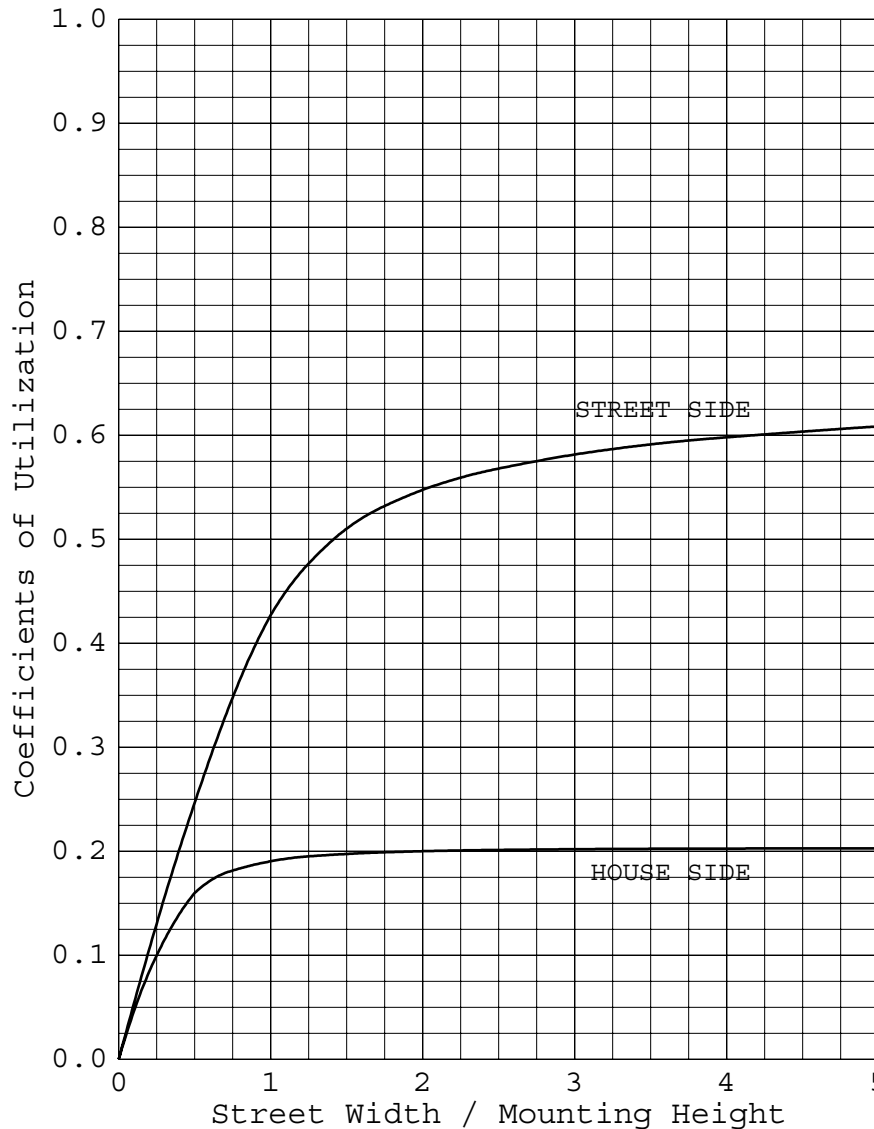




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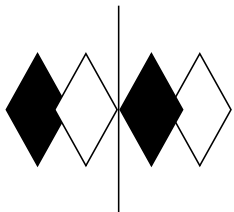
COEFFICIENTS OF UTILIZATION AND FLUX DISTRIBUTION



	LUMENS	PERCENT OF FIXTURE
DOWNWARD STREET SIDE	639	65.1
DOWNWARD HOUSE SIDE	200	20.4
DOWNWARD TOTAL	839	85.4
UPWARD STREET SIDE	137	13.9
UPWARD HOUSE SIDE	6	0.6
UPWARD TOTAL	143	14.6
TOTAL FLUX	982	100.0

EFFICACY = 70.6 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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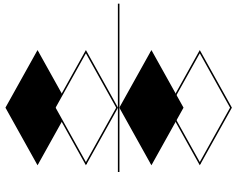
FLUX DISTRIBUTION BY SOLID ANGLE

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

	LUMENS	PERCENT OF FIXTURE	BUG ZONE RATINGS
FORWARD LIGHT	639.	65.1	
FL (0- 30)	144.8	14.7	
FM (30- 60)	324.4	33.0	
FH (60- 80)	122.1	12.4	G0
FVH(80- 90)	47.6	4.8	G1
BACK LIGHT	200.	20.4	
BL (0- 30)	109.7	11.2	B0
BM (30- 60)	70.1	7.1	B0
BH (60- 80)	17.9	1.8	B0 G0
BVH(80- 90)	2.7	0.3	G0
UPLIGHT	143.	14.6	
UL (90-100)	44.6	4.5	U2
UH (100-180)	98.3	10.0	U3
TRAPPED LIGHT	0.	0.0	
TOTAL FLUX	982.	100.0	

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

BUG RATING: B0 U3 G1



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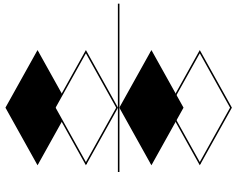
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CANDELA TABULATION

	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.	0.	0.	0.	0.	0.	0.
	165.0	6.	6.	6.	5.	5.	5.	4.	4.	3.	2.
	155.0	14.	14.	13.	13.	11.	10.	9.	8.	6.	5.
	145.0	24.	24.	23.	22.	20.	17.	15.	12.	9.	7.
	135.0	38.	38.	37.	34.	31.	26.	22.	17.	13.	9.
	125.0	56.	56.	54.	50.	45.	39.	32.	25.	17.	11.
	115.0	77.	77.	74.	69.	62.	54.	44.	34.	23.	14.
	105.0	100.	99.	96.	90.	81.	70.	58.	44.	30.	18.
	95.0	120.	120.	115.	108.	98.	85.	71.	55.	37.	21.
	92.5	123.	123.	119.	112.	101.	88.	73.	57.	39.	23.
	90.0	126.	125.	121.	114.	104.	91.	76.	59.	40.	24.
	87.5	128.	127.	123.	116.	106.	93.	78.	61.	42.	26.
	85.0	129.	128.	124.	117.	107.	94.	79.	63.	44.	28.
V	82.5	130.	129.	125.	118.	109.	96.	81.	65.	47.	31.
E	80.0	131.	130.	126.	120.	110.	98.	84.	68.	50.	34.
R	77.5	132.	132.	128.	122.	113.	101.	87.	72.	54.	39.
T	75.0	134.	134.	130.	124.	115.	104.	92.	78.	60.	46.
I	72.5	137.	137.	134.	128.	120.	110.	99.	85.	68.	55.
C	70.0	143.	142.	140.	134.	126.	117.	108.	97.	79.	66.
A	67.5	151.	151.	148.	143.	136.	128.	120.	110.	93.	79.
L	65.0	164.	164.	161.	157.	150.	143.	137.	128.	109.	94.
	62.5	182.	183.	180.	175.	169.	162.	157.	148.	128.	110.
A	60.0	207.	207.	204.	199.	192.	186.	181.	170.	147.	125.
N	57.5	234.	234.	232.	225.	218.	211.	206.	194.	167.	141.
G	55.0	264.	264.	261.	253.	245.	238.	232.	217.	186.	156.
L	52.5	294.	293.	289.	281.	272.	265.	257.	239.	205.	169.
E	50.0	323.	320.	315.	307.	297.	290.	280.	260.	223.	183.
	47.5	346.	343.	339.	329.	319.	312.	300.	279.	239.	193.
	45.0	365.	363.	359.	348.	338.	329.	319.	295.	253.	201.
	42.5	381.	379.	373.	362.	352.	343.	332.	309.	263.	206.
	40.0	394.	391.	384.	373.	362.	353.	341.	316.	265.	207.
	37.5	400.	399.	390.	378.	367.	355.	341.	313.	262.	207.
	35.0	404.	402.	392.	378.	365.	350.	334.	306.	258.	206.
	30.0	403.	401.	389.	371.	354.	338.	321.	295.	250.	207.
	25.0	395.	394.	383.	367.	350.	335.	317.	285.	244.	221.
	20.0	387.	386.	378.	366.	352.	334.	310.	280.	260.	268.
	15.0	396.	396.	389.	377.	361.	341.	322.	312.	318.	343.
	10.0	415.	415.	410.	401.	391.	383.	379.	382.	393.	410.
	5.0	429.	429.	429.	429.	429.	429.	432.	436.	442.	450.
	2.5<<	441.	442.	442.	443.	445.	446.	449.	452.	455.	459.
	0.0	463.	463.	463.	463.	463.	463.	463.	463.	463.	463.

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	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
165.0	2.	1.	1.	0.	0.	0.	0.	0.	0.	0.
155.0	3.	2.	1.	0.	0.	0.	0.	0.	0.	0.
145.0	5.	3.	1.	0.	0.	0.	0.	0.	0.	0.
135.0	6.	4.	2.	0.	0.	0.	0.	0.	0.	0.
125.0	8.	5.	2.	1.	0.	0.	0.	0.	0.	0.
115.0	9.	6.	3.	1.	0.	0.	0.	0.	0.	0.
105.0	11.	7.	4.	1.	0.	0.	0.	0.	0.	0.
95.0	13.	9.	5.	1.	0.	0.	0.	0.	0.	0.
92.5	14.	10.	5.	1.	0.	0.	0.	0.	0.	0.
90.0	15.	11.	6.	1.	0.	0.	0.	0.	0.	0.
87.5	17.	12.	6.	2.	0.	0.	0.	0.	0.	0.
85.0	19.	13.	7.	2.	0.	0.	0.	0.	0.	0.
V 82.5	21.	15.	8.	2.	1.	0.	0.	1.	1.	1.
E 80.0	25.	18.	10.	3.	1.	1.	1.	1.	1.	1.
R 77.5	30.	21.	11.	4.	2.	2.	2.	2.	2.	2.
T 75.0	36.	26.	14.	5.	3.	3.	3.	4.	4.	4.
I 72.5	45.	31.	17.	6.	4.	4.	5.	5.	5.	5.
C 70.0	55.	38.	20.	8.	5.	5.	6.	6.	6.	6.
A 67.5	66.	46.	24.	9.	6.	7.	7.	8.	8.	8.
L 65.0	78.	54.	28.	11.	7.	8.	9.	9.	9.	9.
62.5	91.	62.	32.	13.	9.	10.	10.	11.	11.	11.
A 60.0	103.	70.	37.	15.	10.	11.	12.	13.	13.	13.
N 57.5	115.	78.	41.	17.	12.	13.	14.	15.	15.	15.
G 55.0	125.	84.	46.	20.	15.	16.	17.	17.	17.	17.
L 52.5	134.	91.	50.	23.	17.	18.	20.	20.	20.	20.
E 50.0	142.	97.	54.	26.	21.	22.	23.	23.	23.	23.
47.5	148.	102.	59.	31.	25.	26.	28.	28.	28.	28.
45.0	153.	106.	63.	35.	31.	32.	33.	33.	33.	33.
42.5	156.	110.	68.	41.	37.	39.	41.	41.	41.	40.
40.0	159.	115.	73.	48.	46.	48.	50.	50.	50.	50.
37.5	162.	121.	80.	57.	56.	59.	61.	62.	62.	62.
35.0	165.	131.	91.	67.	68.	73.	76.	77.	77.	78.
30.0	184.	172.	130.	98.	98.	106.	113.	118.	119.	120.
25.0	231.	250.	215.	157.	140.	144.	155.	162.	166.	166.
20.0	306.	341.	325.	267.	218.	197.	196.	200.	203.	203.
15.0	380.	410.	413.	386.	341.	298.	271.	258.	253.	250.
10.0	430.	447.	456.	456.	447.	430.	408.	392.	388.	384.
5.0	457.	464.	470.	475.	478.	479.	479.	478.	478.	477.
2.5<<	462.	466.	469.	473.	476.	477.	479.	480.	480.	480.
0.0	463.	463.	463.	463.	463.	463.	463.	463.	463.	463.

||
PLANE OF MAXIMUM CANDELA

—
CONE OF MAXIMUM CANDELA



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5-DEGREE
ZONAL LUMEN SUMMARY

0- 5	11
5- 10	31
10- 15	45
15- 20	52
20- 25	56
25- 30	60
30- 35	64
35- 40	69
40- 45	72
45- 50	70
50- 55	64
55- 60	55
60- 65	45
65- 70	37
70- 75	31
75- 80	28
80- 85	26
85- 90	25
90- 95	23
95-100	21
100-105	19
105-110	17
110-115	14
115-120	12
120-125	10
125-130	8
130-135	6
135-140	4
140-145	3
145-150	2
150-155	2
155-160	1
160-165	1
165-170	0
170-175	0
175-180	0

10-DEGREE
ZONAL LUMEN SUMMARY

0- 10	42
0- 20	138
0- 30	254
0- 40	388
0- 50	530
0- 60	649
0- 70	730
0- 80	789
0- 90	839
0-100	884
0-110	920
0-120	946
0-130	963
0-140	973
0-150	979
0-160	981
0-170	982
0-180	982



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ADDRESS: 170 LUDLOW AVE
NORTHVALE, NJ 07647

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CATALOG NUMBER: ENTRA12N

ADDRESS: 170 LUDLOW AVE
NORTHVALE, NJ 07647

LUMINAIRE: CAST FINNED BROWN 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 BROWN 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 (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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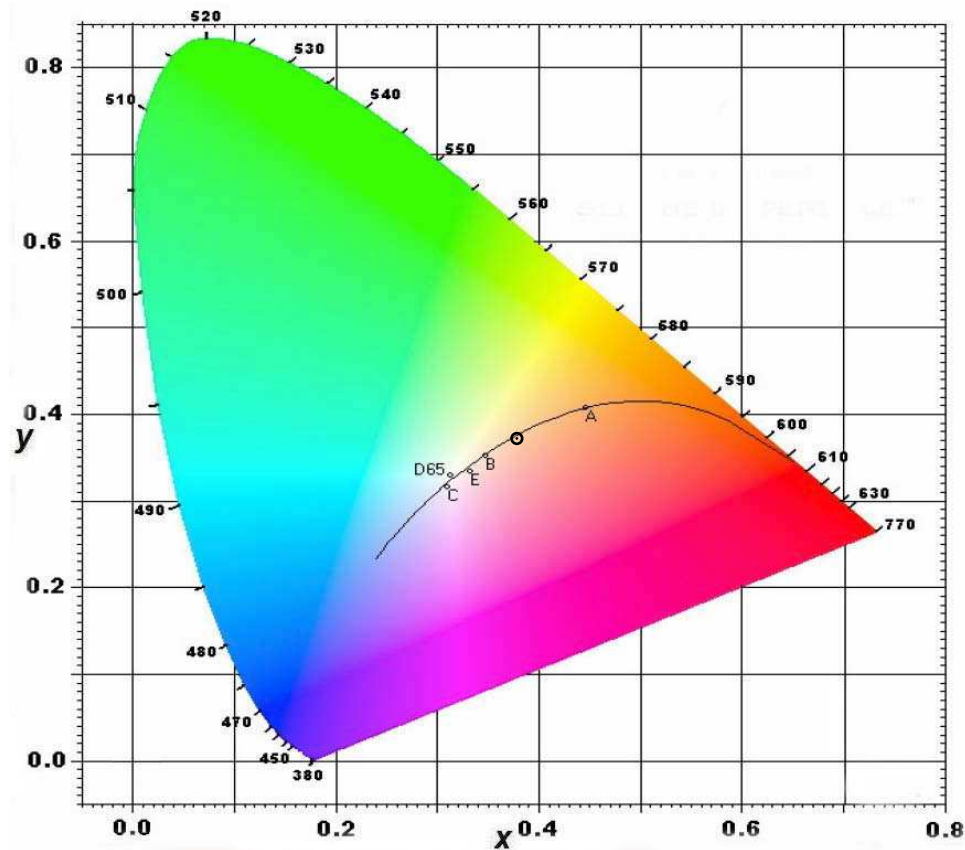
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CIE Chromaticity Diagram



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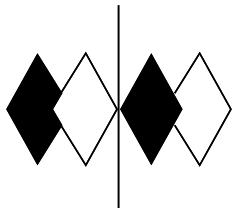
RESULTS:

SPECTRORADIOMETRIC	
Observer	CIE 1931 2 degree
Chromaticity Ordinate x	0.3781
Chromaticity Ordinate y	0.3717
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2256
Chromaticity Ordinate v'	0.4990
Correlated Color Temp CCT (K)	4027
ANSI C78.377-2008 Duv	-0.002
Total Radiant Flux (milliWatts)	3129 *
ELECTRICAL	
Input Voltage (Volts AC)	120.0
Input Current (Amps AC)	0.117
Input Power (Watts)	13.9
Input Power Factor (%)	99.0
Input Current THD (%)	10.1
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)	0.062
Input Power (Watts)	15.0
Input Power Factor (%)	87.3
Input Current THD (%)	24.0
Input Voltage THD (%)	0.1

COLOR RENDERING INDICES	CRI
Ra (Average 1-8)	88
R1 Light greyish red	88
R2 Dark greyish yellow	94
R3 Strong yellowish green	96
R4 Moderate yellowish green	88
R5 Light bluish green	88
R6 Light blue	90
R7 Light violet	88
R8 Light reddish purple	73
R9 Strong red	32
R10 Strong yellow	84
R11 Strong green	88
R12 Strong blue	66
R13 Light yellowish pink (skin)	90
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 LAB CODE: 200925-0

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REPORT NUMBER: ITL76955
DATE: 04/29/13
PREPARED FOR: RAB LIGHTING, INC.
CATALOG NUMBER: ENTRA12N

RESULTS:

Wavelength	mW per nm	Wavelength	mW per nm	Wavelength	mW per nm
380	0.082	515	11.315	650	9.915
385	0.085	520	11.986	655	9.004
390	0.090	525	12.456	660	8.125
395	0.101	530	12.727	665	7.284
400	0.119	535	12.874	670	6.487
405	0.197	540	12.957	675	5.759
410	0.276	545	13.069	680	5.089
415	0.426	550	13.216	685	4.478
420	0.712	555	13.421	690	3.918
425	1.209	560	13.736	695	3.428
430	2.110	565	14.141	700	2.991
435	3.652	570	14.605	705	2.600
440	6.236	575	15.129	710	2.259
445	10.938	580	15.647	715	1.963
450	17.473	585	16.149	720	1.708
455	20.104	590	16.560	725	1.486
460	15.984	595	16.880	730	1.288
465	11.380	600	16.994	735	1.121
470	8.813	605	16.946	740	0.973
475	6.855	610	16.658	745	0.845
480	5.648	615	16.166	750	0.735
485	5.508	620	15.457	755	0.639
490	5.974	625	14.649	760	0.558
495	6.828	630	13.739	765	0.487
500	7.992	635	12.774	770	0.426
505	9.254	640	11.811	775	0.372
510	10.399	645	10.865	780	0.325

