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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 12 foot mounting height.



REPORT NUMBER: ITL79976

ISSUE DATE: 11/25/13

PAGE: 1 OF 7

PREPARED FOR: RAB LIGHTING, INC.

CATALOG NUMBER: CLED78N OR PLED78N (W/
CLEAR FLAT GLASS LENS - CEILING OR
PENDENT MOUNT)

LUMINAIRE: CAST 2-PIECE BROWN PAINTED
FINNED METAL HOUSING, 6 CAST METAL
HEAT SINKS/CIRCUIT BOARD MOUNTING
BRACKETS, 6 CIRCUIT BOARDS EACH WITH 1
LED AND MOLDED PLASTIC CIRCUIT BOARD
PERIMETER OVERLAY WITH SPECULAR
FINISH, MOLDED PLASTIC REFLECTOR WITH
SPECULAR FINISH AND 1 APERTURE PER
LED, CLEAR FLAT GLASS LENS IN CAST
BROWN PAINTED METAL FRAME.

LAMPS: SIX WHITE MULTI-CHIP LIGHT
EMITTING DIODES (LEDs), AIMED AT THE
HORIZON.

TOTAL INPUT WATTS = 89.1 AT 120.0 VOLTS

LED DRIVERS: THREE RAB RD26S

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

TEST PROCEDURE: IESNA LM-79-08

TEST DISTANCE = 20.0 FEET

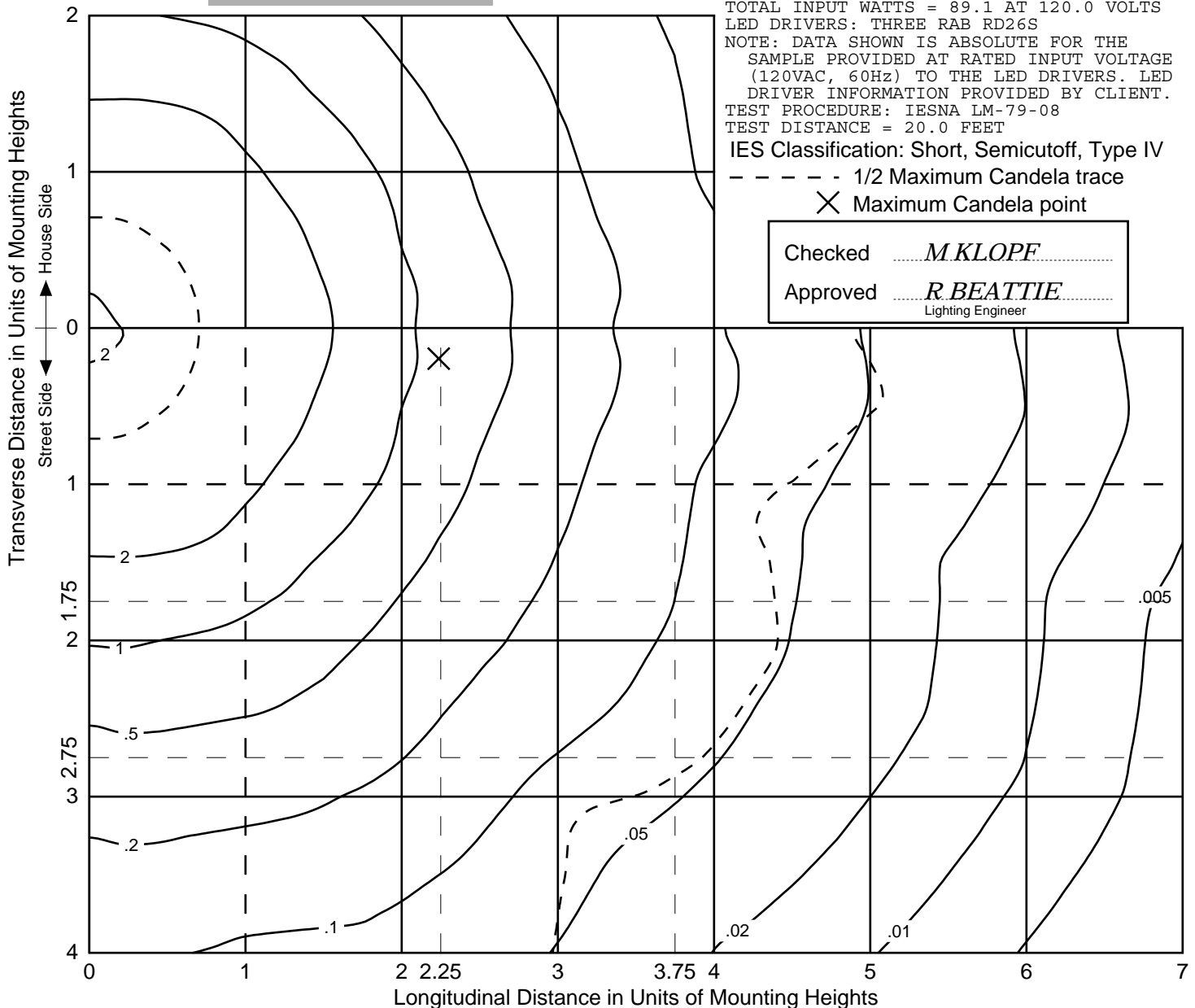
IES Classification: Short, Semicutoff, Type IV

--- 1/2 Maximum Candela trace

X Maximum Candela point

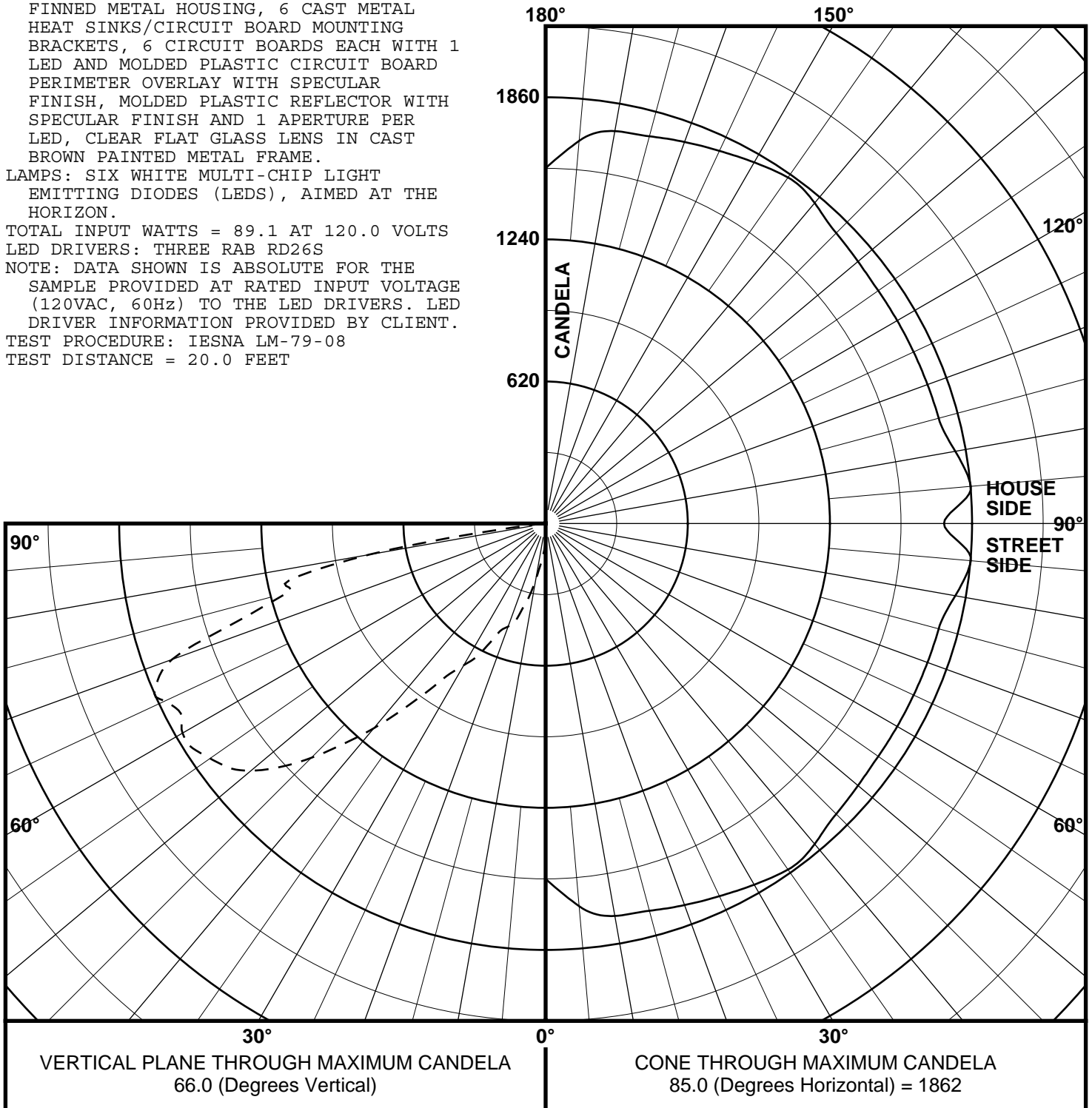
Checked *M. KLOPF*

Approved *R. BEATTIE*
Lighting Engineer



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DRIVER INFORMATION PROVIDED BY CLIENT.
TEST PROCEDURE: IESNA LM-79-08
TEST DISTANCE = 20.0 FEET

MAXIMUM PLANE AND MAXIMUM CONE PLOTS OF CANDELA

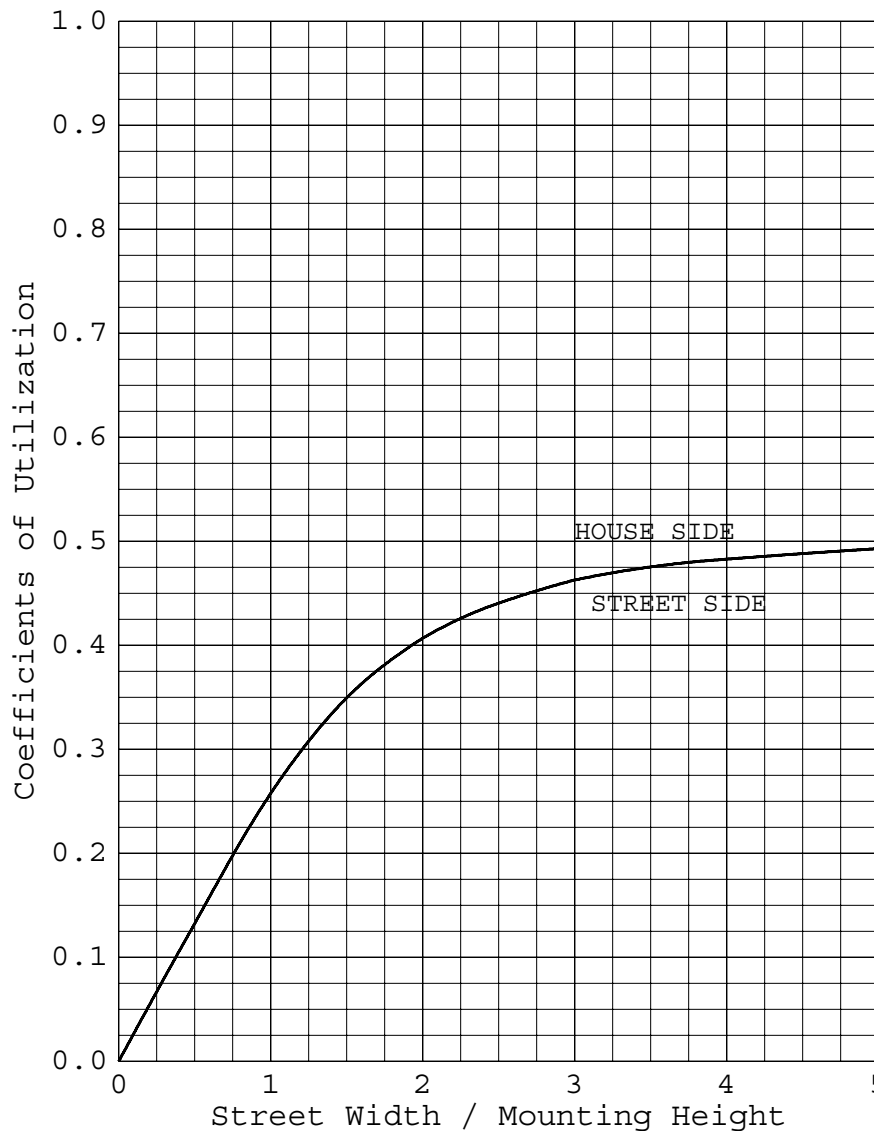




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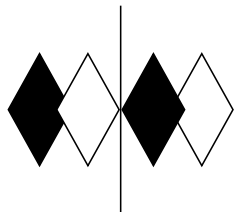
COEFFICIENTS OF UTILIZATION AND FLUX DISTRIBUTION



	LUMENS	PERCENT OF FIXTURE
DOWNWARD STREET SIDE	3304	50.0
DOWNWARD HOUSE SIDE	3304	50.0
DOWNWARD TOTAL	6607	100.0
UPWARD STREET SIDE	0	0.0
UPWARD HOUSE SIDE	0	0.0
UPWARD TOTAL	0	0.0
TOTAL FLUX	6607	100.0

EFFICACY = 74.2 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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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	3304.	50.0	
FL (0- 30)	196.9	3.0	
FM (30- 60)	1569.4	23.8	
FH (60- 80)	1462.4	22.1	G1
FVH(80- 90)	75.0	1.1	G1
BACK LIGHT	3304.	50.0	
BL (0- 30)	196.9	3.0	B1
BM (30- 60)	1569.4	23.8	B2
BH (60- 80)	1462.4	22.1	B3 G1
BVH(80- 90)	75.0	1.1	G1
UPLIGHT	0.	0.0	
UL (90-100)	0.0	0.0	U0
UH (100-180)	0.0	0.0	U0
TRAPPED LIGHT	0.	0.0	
TOTAL FLUX	6607.	100.0	

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

BUG RATING: B3 U0 G1



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CANDELA TABULATION

		LATERAL ANGLE										
		0.0	5.0	15.0	25.0	35.0	45.0	55.0	65.0	75.0	85.0	90.0
		90.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
		87.5	3.	3.	2.	3.	3.	2.	3.	2.	2.	3.
		85.0	28.	24.	24.	24.	23.	21.	22.	20.	23.	27.
		82.5	223.	194.	169.	214.	231.	171.	192.	221.	164.	215.
		80.0	642.	652.	562.	787.	823.	533.	618.	683.	531.	780.
		77.5	880.	1041.	917.	1148.	1094.	898.	1061.	1068.	903.	1146.
		75.0	980.	1124.	1079.	1160.	1146.	1094.	1210.	1157.	1059.	1167.
		72.5	1178.	1234.	1239.	1372.	1450.	1257.	1210.	1213.	1209.	1396.
		70.0	1389.	1460.	1522.	1721.	1704.	1524.	1466.	1487.	1517.	1736.
		67.5	1511.	1655.	1751.	1834.	1804.	1763.	1732.	1727.	1751.	1837.
		66.0<<	1550.	1676.	1749.	1794.	1843.	1792.	1771.	1771.	1775.	1862.
		65.0	1597.	1696.	1714.	1773.	1821.	1737.	1775.	1777.	1731.	1832.
V	62.5	1733.	1756.	1707.	1777.	1779.	1731.	1807.	1823.	1728.	1794.	1800.
E	60.0	1764.	1737.	1712.	1797.	1805.	1726.	1774.	1791.	1737.	1829.	1822.
R	57.5	1674.	1678.	1683.	1800.	1808.	1683.	1705.	1724.	1721.	1825.	1821.
T	55.0	1556.	1602.	1650.	1771.	1769.	1646.	1630.	1640.	1669.	1787.	1795.
I	52.5	1474.	1529.	1591.	1717.	1723.	1600.	1547.	1549.	1615.	1747.	1743.
C	50.0	1423.	1446.	1521.	1644.	1660.	1520.	1468.	1474.	1544.	1677.	1688.
A	47.5	1385.	1356.	1444.	1548.	1541.	1453.	1397.	1411.	1470.	1573.	1583.
L	45.0	1366.	1307.	1354.	1412.	1423.	1362.	1329.	1347.	1374.	1446.	1443.
	42.5	1251.	1240.	1225.	1273.	1289.	1245.	1250.	1263.	1257.	1304.	1306.
A	40.0	1116.	1143.	1088.	1140.	1146.	1118.	1145.	1159.	1136.	1166.	1176.
N	37.5	1017.	1022.	988.	999.	999.	1004.	1054.	1059.	1018.	1020.	1036.
G	35.0	917.	909.	899.	852.	874.	904.	941.	933.	917.	888.	885.
L	32.5	790.	786.	782.	764.	757.	795.	815.	816.	814.	777.	773.
E	30.0	690.	682.	662.	705.	699.	701.	689.	693.	700.	714.	712.
	27.5	623.	610.	604.	631.	663.	635.	632.	625.	630.	658.	664.
	25.0	564.	552.	544.	565.	580.	587.	592.	586.	583.	573.	565.
	22.5	509.	509.	497.	502.	502.	508.	520.	512.	506.	502.	505.
	20.0	449.	449.	452.	463.	472.	468.	475.	461.	459.	478.	482.
	17.5	413.	419.	428.	439.	440.	437.	439.	438.	437.	451.	455.
	15.0	362.	370.	363.	381.	382.	366.	382.	385.	373.	381.	390.
	12.5	317.	314.	306.	321.	324.	307.	320.	325.	314.	321.	327.
	10.0	242.	236.	238.	241.	247.	249.	254.	256.	253.	248.	250.
	7.5	182.	184.	184.	187.	187.	185.	187.	190.	186.	188.	189.
	5.0	146.	145.	145.	145.	147.	151.	152.	151.	150.	147.	147.
	2.5	108.	106.	108.	107.	107.	107.	108.	111.	109.	110.	108.
	0.0	78.	78.	78.	78.	78.	78.	78.	78.	78.	78.	78.
											PLANE OF MAXIMUM CANDELA	
											CONE OF MAXIMUM CANDELA	



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5-DEGREE
ZONAL LUMEN SUMMARY

0- 5	3
5- 10	14
10- 15	38
15- 20	71
20- 25	108
25- 30	161
30- 35	234
35- 40	341
40- 45	467
45- 50	592
50- 55	705
55- 60	800
60- 65	858
65- 70	867
70- 75	687
75- 80	513
80- 85	146
85- 90	4

10-DEGREE
ZONAL LUMEN SUMMARY

0- 10	17
0- 20	125
0- 30	394
0- 40	969
0- 50	2028
0- 60	3533
0- 70	5258
0- 80	6457
0- 90	6607



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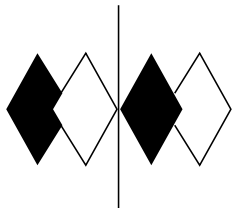
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ADDRESS: 170 LUDLOW AVE
NORTHVALE, NJ 07647

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REPORT NUMBER: ITL79979
DATE: 11/27/13
PREPARED FOR: RAB LIGHTING, INC.
CATALOG NUMBER: CLED78N OR PLED78N (W/ CLEAR FLAT GLASS LENS - CEILING OR PENDENT MOUNT)

ADDRESS: 170 LUDLOW AVE
NORTHVALE, NJ 07647

LUMINAIRE: CAST 2-PIECE BROWN PAINTED FINNED METAL HOUSING, 6 CAST METAL HEAT SINKS/CIRCUIT BOARD MOUNTING BRACKETS, 6 CIRCUIT BOARDS EACH WITH 1 LED AND MOLDED PLASTIC CIRCUIT BOARD PERIMETER OVERLAY WITH SPECULAR FINISH, MOLDED PLASTIC REFLECTOR WITH SPECULAR FINISH AND 1 APERTURE PER LED, CLEAR FLAT GLASS LENS IN CAST BROWN PAINTED METAL FRAME.

LAMP: SIX WHITE MULTI-CHIP LIGHT EMITTING DIODES (LEDs), AIMED AT THE HORIZON.

DRIVERS: THREE RAB RD26S

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

INSTRUMENTS:	Associated Power Technologies APT5040 AC Power Source	Calibration Due: N/A
	Yokogawa WT210 Digital Power Meter #9	02/28/14
	Ocean Optics QE65000 Spectroradiometer	10/16/14
	ITL 2.0m Diameter Integrating Sphere S20-2, 4PI Geometry	10/16/14

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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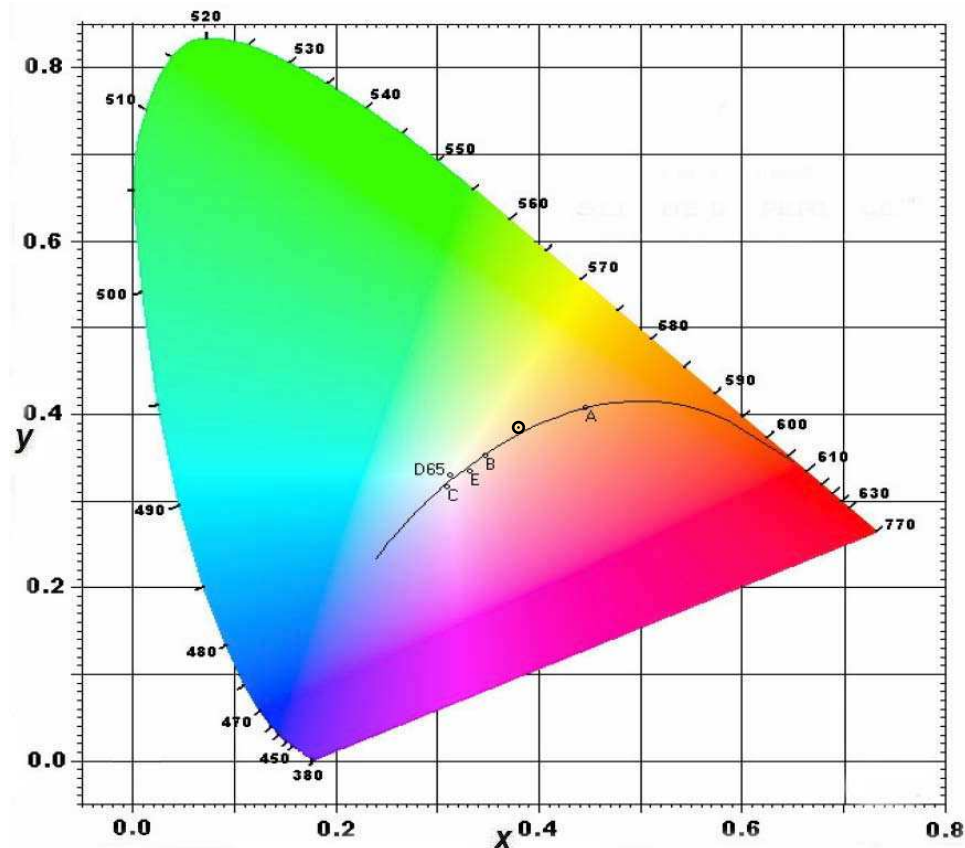
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CIE Chromaticity Diagram





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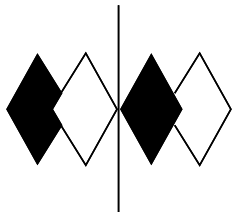
RESULTS:

SPECTRORADIOMETRIC	
Observer	CIE 1931 2 degree
Chromaticity Ordinate x	0.3797
Chromaticity Ordinate y	0.3844
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2216
Chromaticity Ordinate v'	0.5048
Correlated Color Temp CCT (K)	4075
ANSI C78.377-2008 Duv	0.004
Total Radiant Flux (milliWatts)	19720 *
ELECTRICAL	
Input Voltage (Volts AC)	120.0
Input Current (Amps AC)	0.747
Input Power (Watts)	89.1
Input Power Factor (%)	99.4
Input Current THD (%)	8.1
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)	0.353
Input Power (Watts)	88.8
Input Power Factor (%)	90.8
Input Current THD (%)	10.7
Input Voltage THD (%)	0.1

COLOR RENDERING INDICES	CRI
Ra (Average 1-8)	82
R1 Light greyish red	80
R2 Dark greyish yellow	85
R3 Strong yellowish green	90
R4 Moderate yellowish green	84
R5 Light bluish green	81
R6 Light blue	81
R7 Light violet	87
R8 Light reddish purple	65
R9 Strong red	5
R10 Strong yellow	66
R11 Strong green	84
R12 Strong blue	61
R13 Light yellowish pink (skin)	81
R14 Moderate olive green (leaf)	94

*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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RESULTS:

Wavelength	mW per nm	Wavelength	mW per nm	Wavelength	mW per nm
380	0.471	515	79.633	650	56.260
385	0.484	520	84.891	655	49.924
390	0.548	525	88.268	660	44.061
395	0.664	530	90.257	665	38.664
400	0.913	535	91.150	670	33.741
405	1.406	540	91.685	675	29.292
410	2.436	545	92.120	680	25.387
415	4.546	550	92.827	685	21.898
420	8.894	555	93.900	690	18.842
425	17.306	560	95.531	695	16.203
430	31.370	565	98.057	700	13.892
435	52.603	570	100.839	705	11.881
440	84.967	575	103.815	710	10.132
445	116.293	580	106.750	715	8.650
450	110.745	585	109.297	720	7.392
455	77.286	590	111.117	725	6.301
460	52.937	595	111.811	730	5.372
465	38.473	600	111.328	735	4.582
470	28.039	605	109.364	740	3.905
475	23.177	610	106.230	745	3.344
480	23.125	615	102.005	750	2.876
485	26.510	620	96.641	755	2.459
490	33.182	625	90.558	760	2.110
495	42.501	630	83.761	765	1.814
500	53.132	635	76.815	770	1.561
505	63.435	640	69.866	775	1.339
510	72.513	645	63.038	780	1.150

