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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: ITL79975

ISSUE DATE: 11/22/13

PAGE: 1 OF 7

PREPARED FOR: RAB LIGHTING, INC.

CATALOG NUMBER: CLED78Y OR PLED78Y (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 = 90.1 AT 120.0 VOLTS

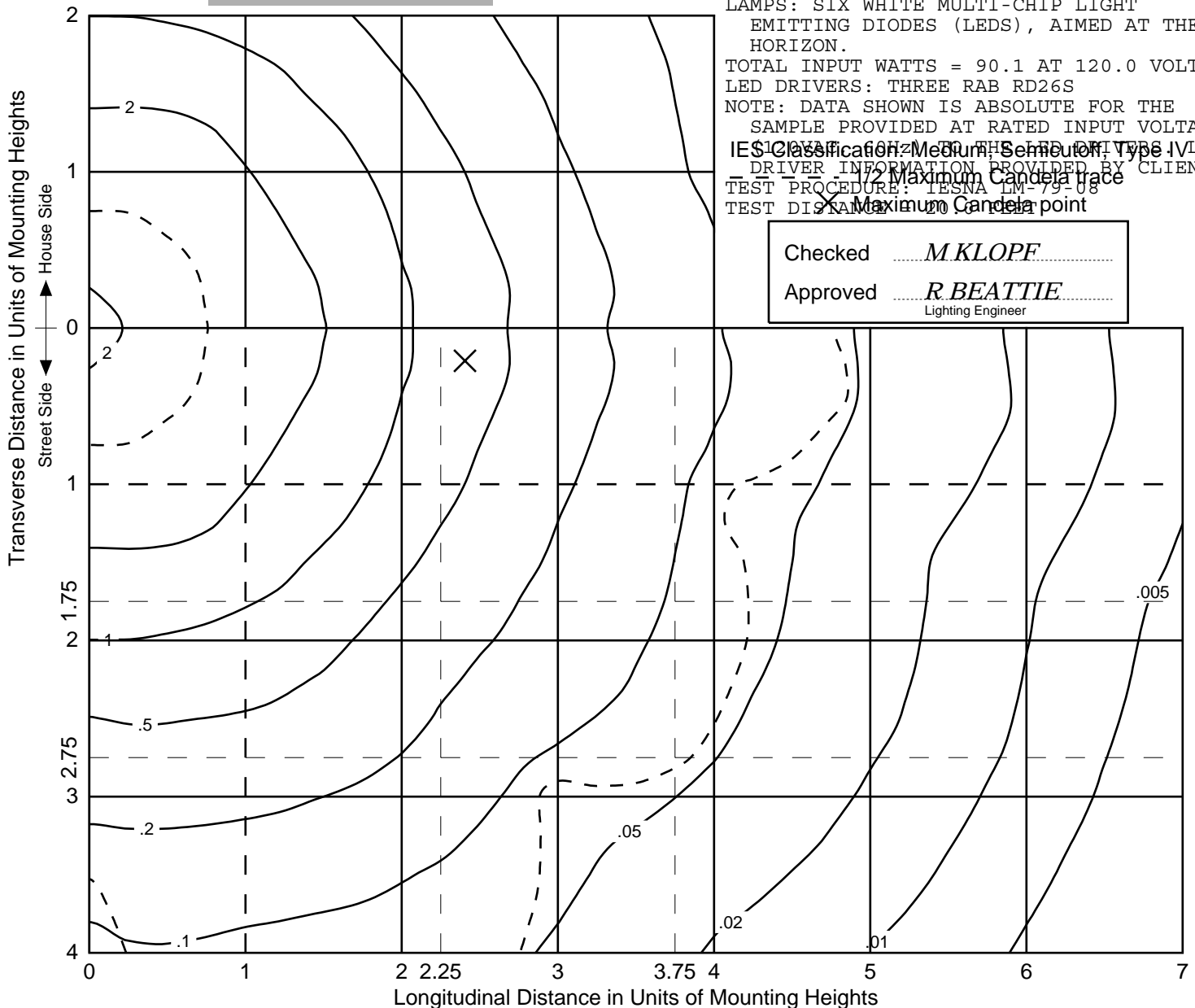
LED DRIVERS: THREE RAB RD26S

NOTE: DATA SHOWN IS ABSOLUTE FOR THE
SAMPLE PROVIDED AT RATED INPUT VOLTAGE

IES Classification: Medium Semi-cutoff, Type IV
DRIVER INFORMATION PROVIDED BY CLIENT.

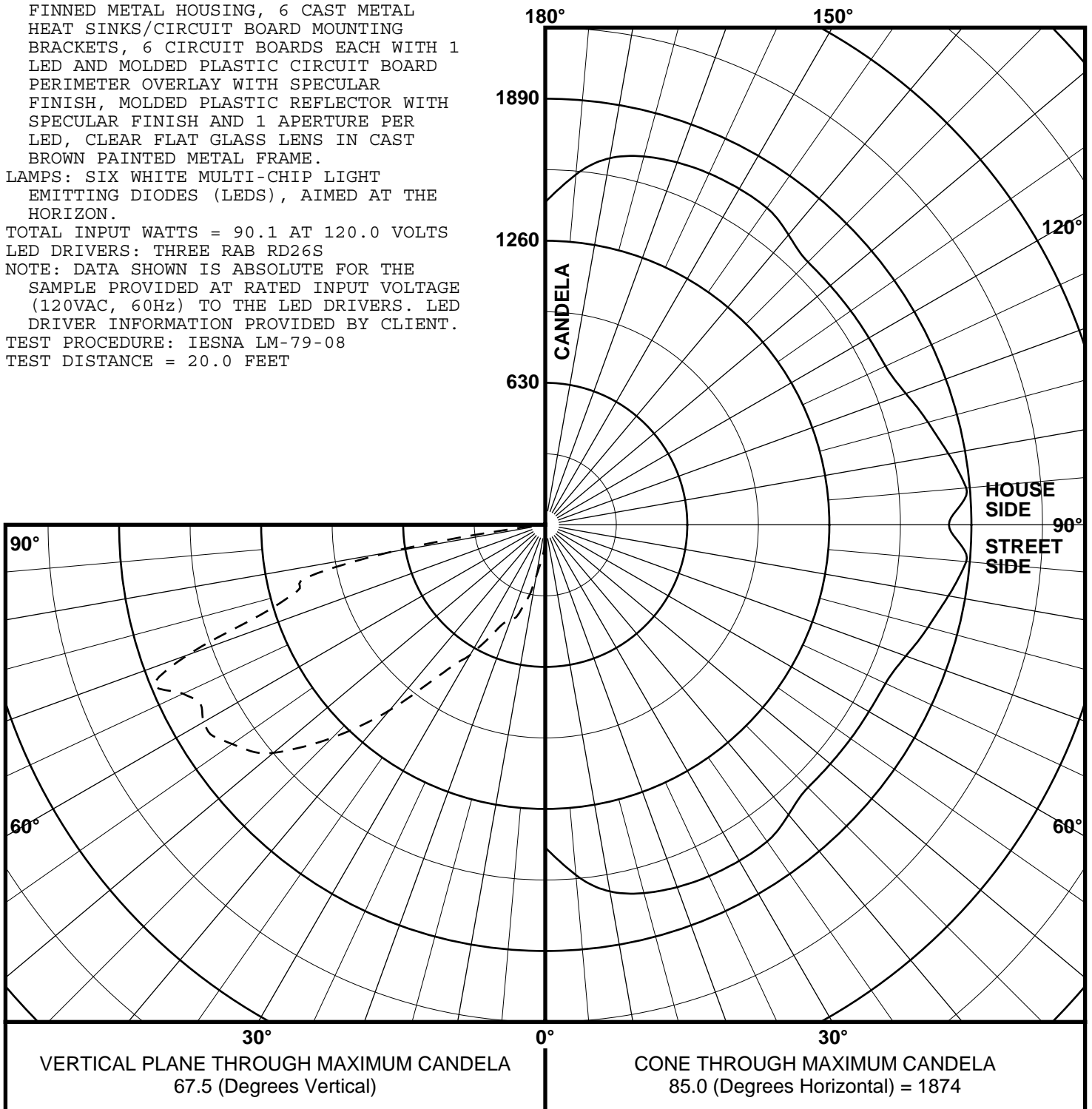
TEST PROCEDURE: IESNA LM-79-08

TEST DISTANCE: 20 Candela point



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LAMPS: SIX WHITE MULTI-CHIP LIGHT
EMITTING DIODES (LEDs), AIMED AT THE
HORIZON.
TOTAL INPUT WATTS = 90.1 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

MAXIMUM PLANE AND MAXIMUM CONE PLOTS OF CANDELA

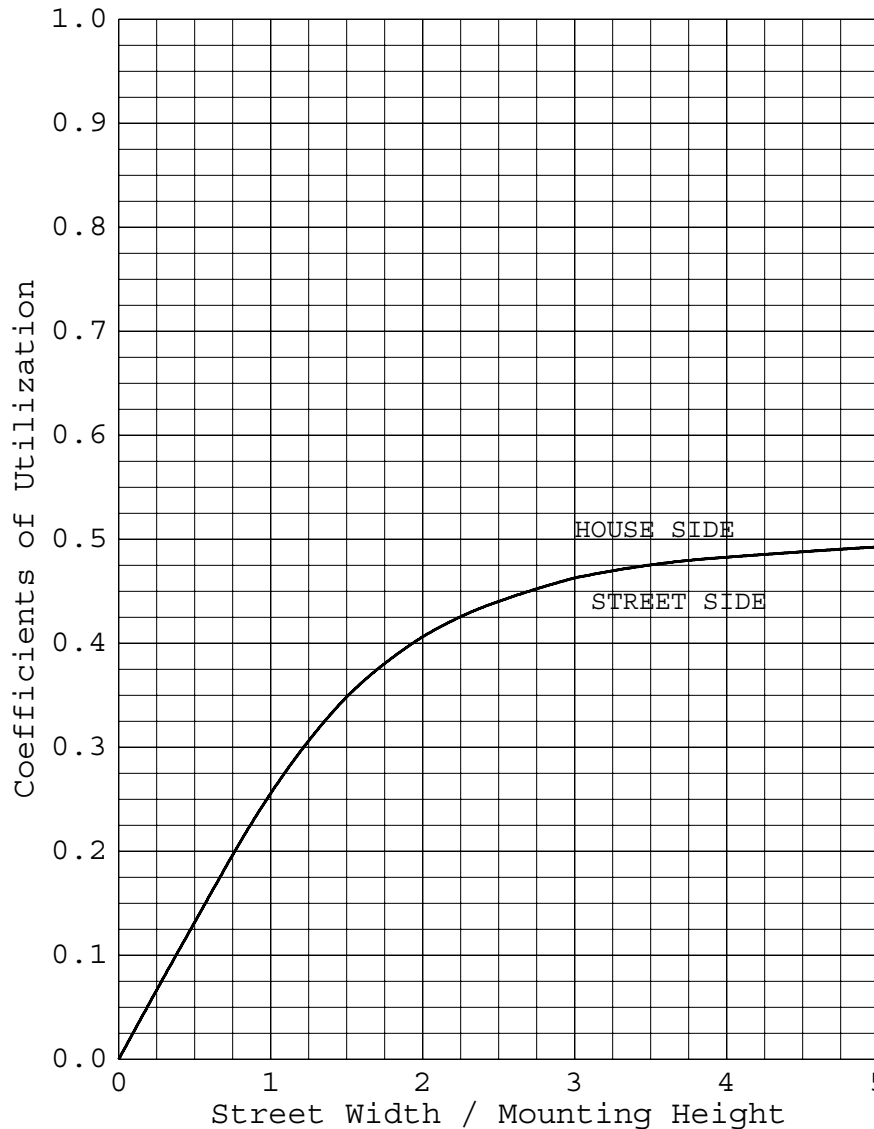




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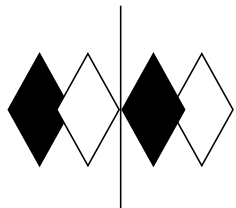
COEFFICIENTS OF UTILIZATION AND FLUX DISTRIBUTION



	LUMENS	PERCENT OF FIXTURE
DOWNWARD STREET SIDE	3094	50.0
DOWNWARD HOUSE SIDE	3094	50.0
DOWNWARD TOTAL	6187	100.0
UPWARD STREET SIDE	0	0.0
UPWARD HOUSE SIDE	0	0.0
UPWARD TOTAL	0	0.0
TOTAL FLUX	6187	100.0

EFFICACY = 68.7 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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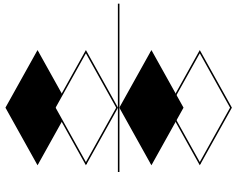
FLUX DISTRIBUTION BY SOLID ANGLE

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

	LUMENS	PERCENT OF FIXTURE	BUG ZONE RATINGS
FORWARD LIGHT	3094.	50.0	
FL (0- 30)	179.3	2.9	
FM (30- 60)	1454.3	23.5	
FH (60- 80)	1388.6	22.4	G1
FVH(80- 90)	71.3	1.2	G1
BACK LIGHT	3094.	50.0	
BL (0- 30)	179.3	2.9	B1
BM (30- 60)	1454.3	23.5	B2
BH (60- 80)	1388.6	22.4	B3 G1
BVH(80- 90)	71.3	1.2	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	6187.	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
V E R T I C A L A N G L E	90.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	87.5	3.	4.	3.	4.	3.	3.	4.	3.	3.	4.	5.
	85.0	21.	24.	22.	27.	21.	21.	22.	19.	20.	24.	28.
	82.5	230.	231.	161.	225.	240.	169.	191.	174.	169.	198.	189.
	80.0	599.	643.	506.	717.	770.	493.	578.	600.	495.	705.	654.
	77.5	780.	927.	893.	1038.	1029.	854.	1060.	998.	866.	1085.	1037.
	75.0	882.	1019.	1019.	1071.	1109.	1021.	1170.	1112.	1026.	1140.	1048.
	72.5	1047.	1094.	1173.	1308.	1395.	1178.	1135.	1124.	1167.	1318.	1243.
	70.0	1250.	1316.	1440.	1646.	1613.	1423.	1380.	1426.	1477.	1686.	1628.
	67.5<<	1431.	1559.	1691.	1719.	1715.	1648.	1654.	1665.	1757.	1874.	1790.
	65.0	1520.	1584.	1634.	1674.	1771.	1685.	1710.	1659.	1685.	1773.	1733.
	62.5	1644.	1651.	1627.	1675.	1693.	1642.	1712.	1698.	1676.	1723.	1726.
	60.0	1666.	1643.	1636.	1698.	1716.	1630.	1660.	1651.	1660.	1749.	1743.
	57.5	1577.	1570.	1599.	1699.	1718.	1585.	1575.	1580.	1622.	1745.	1739.
	55.0	1468.	1492.	1555.	1661.	1673.	1540.	1500.	1504.	1580.	1695.	1703.
	52.5	1391.	1418.	1505.	1608.	1619.	1490.	1422.	1425.	1527.	1648.	1648.
	50.0	1349.	1333.	1445.	1536.	1543.	1415.	1334.	1350.	1440.	1574.	1581.
	47.5	1307.	1264.	1372.	1429.	1431.	1344.	1255.	1275.	1369.	1458.	1474.
	45.0	1245.	1220.	1276.	1308.	1307.	1255.	1199.	1216.	1283.	1336.	1321.
	42.5	1158.	1147.	1133.	1176.	1183.	1128.	1116.	1144.	1149.	1207.	1200.
	40.0	1054.	1022.	1017.	1045.	1056.	1000.	1024.	1029.	1034.	1074.	1086.
	37.5	963.	929.	923.	896.	918.	903.	931.	940.	947.	932.	959.
	35.0	855.	839.	828.	796.	769.	809.	831.	848.	842.	813.	805.
	32.5	745.	732.	700.	691.	679.	701.	717.	739.	724.	726.	724.
	30.0	632.	612.	603.	612.	642.	614.	622.	632.	644.	667.	683.
	27.5	574.	547.	547.	552.	564.	573.	581.	590.	604.	590.	587.
	25.0	526.	510.	505.	489.	485.	496.	513.	538.	525.	518.	512.
	22.5	441.	443.	430.	437.	444.	449.	462.	470.	468.	470.	477.
	20.0	400.	406.	405.	414.	420.	421.	439.	443.	434.	449.	450.
	17.5	376.	379.	389.	392.	409.	394.	413.	419.	411.	429.	433.
	15.0	323.	333.	326.	357.	354.	345.	368.	367.	354.	370.	381.
	12.5	292.	290.	279.	298.	307.	296.	308.	315.	302.	316.	317.
	10.0	232.	227.	223.	226.	231.	235.	240.	244.	237.	233.	234.
	7.5	175.	175.	171.	176.	173.	174.	177.	177.	180.	181.	183.
	5.0	140.	142.	139.	139.	139.	142.	147.	148.	148.	143.	143.
	2.5	103.	102.	101.	104.	103.	104.	106.	107.	107.	106.	107.
	0.0	76.	76.	76.	76.	76.	76.	76.	76.	76.	76.	76.
											PLANE OF MAXIMUM CANDELA	
											CONE OF MAXIMUM CANDELA	



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5-DEGREE
ZONAL LUMEN SUMMARY

0- 5	3
5- 10	13
10- 15	36
15- 20	66
20- 25	97
25- 30	145
30- 35	212
35- 40	310
40- 45	427
45- 50	548
50- 55	658
55- 60	753
60- 65	816
65- 70	829
70- 75	649
75- 80	483
80- 85	139
85- 90	4

10-DEGREE
ZONAL LUMEN SUMMARY

0- 10	16
0- 20	117
0- 30	359
0- 40	880
0- 50	1856
0- 60	3267
0- 70	4912
0- 80	6045
0- 90	6187



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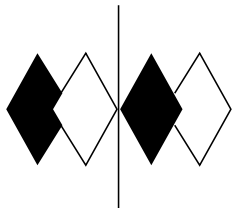
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ADDRESS: 170 LUDLOW AVE
NORTHVALE, NJ 07647

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REPORT NUMBER: ITL79978
DATE: 11/27/13
PREPARED FOR: RAB LIGHTING, INC.
CATALOG NUMBER: CLED78Y OR PLED78Y (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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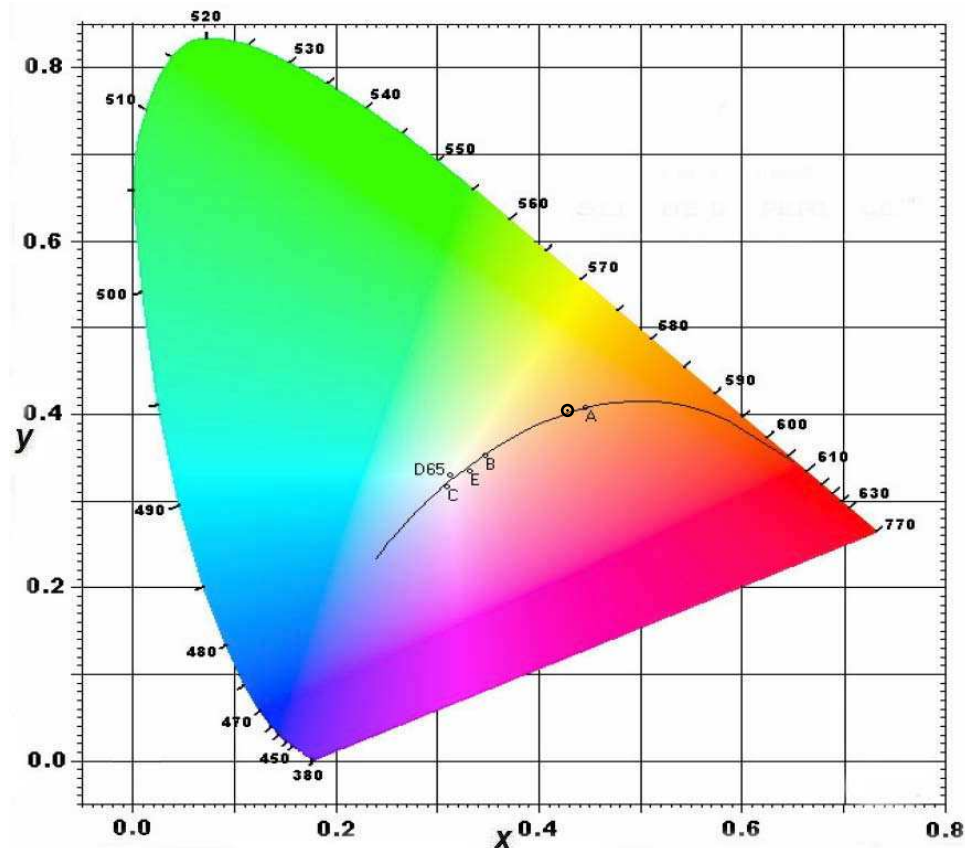
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CIE Chromaticity Diagram





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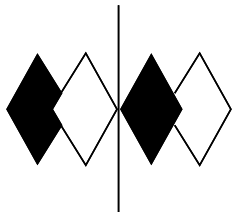
RESULTS:

SPECTRORADIOMETRIC	
Observer	CIE 1931 2 degree
Chromaticity Ordinate x	0.4280
Chromaticity Ordinate y	0.4040
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2449
Chromaticity Ordinate v'	0.5200
Correlated Color Temp CCT (K)	3155
ANSI C78.377-2008 Duv	0.001
Total Radiant Flux (milliWatts)	18316 *
ELECTRICAL	
Input Voltage (Volts AC)	120.0
Input Current (Amps AC)	0.756
Input Power (Watts)	90.3
Input Power Factor (%)	99.5
Input Current THD (%)	8.0
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)	0.356
Input Power (Watts)	89.8
Input Power Factor (%)	91.1
Input Current THD (%)	11.4
Input Voltage THD (%)	0.1

COLOR RENDERING INDICES	CRI
Ra (Average 1-8)	81
R1 Light greyish red	79
R2 Dark greyish yellow	88
R3 Strong yellowish green	96
R4 Moderate yellowish green	81
R5 Light bluish green	80
R6 Light blue	86
R7 Light violet	83
R8 Light reddish purple	58
R9 Strong red	0
R10 Strong yellow	73
R11 Strong green	81
R12 Strong blue	65
R13 Light yellowish pink (skin)	81
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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RESULTS:

Wavelength	mW per nm	Wavelength	mW per nm	Wavelength	mW per nm
380	0.363	515	59.044	650	66.156
385	0.359	520	63.745	655	58.809
390	0.364	525	67.259	660	51.986
395	0.399	530	69.916	665	45.638
400	0.509	535	71.931	670	39.835
405	0.723	540	73.852	675	34.603
410	1.145	545	75.955	680	30.001
415	2.057	550	78.615	685	25.894
420	3.905	555	81.900	690	22.306
425	7.503	560	86.060	695	19.243
430	13.821	565	91.271	700	16.396
435	23.516	570	97.027	705	14.030
440	38.181	575	103.141	710	11.968
445	58.687	580	109.146	715	10.225
450	71.187	585	114.611	720	8.700
455	60.902	590	119.089	725	7.408
460	43.280	595	121.982	730	6.299
465	32.393	600	123.210	735	5.363
470	25.150	605	122.566	740	4.572
475	20.360	610	120.299	745	3.897
480	19.073	615	116.490	750	3.343
485	20.834	620	111.036	755	2.851
490	24.872	625	104.683	760	2.443
495	30.954	630	97.271	765	2.090
500	38.429	635	89.575	770	1.796
505	46.067	640	81.764	775	1.538
510	53.112	645	73.904	780	1.318

