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THE LIGHT CENTER OF THE INDUSTRY SINCE 1955

NVLAP
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 15 foot mounting height.



REPORT NUMBER: ITL80200
ISSUE DATE: 12/18/13 PAGE: 1 OF 8
PREPARED FOR: RAB LIGHTING, INC.
CATALOG NUMBER: ALED5T78Y (TYPE V)
LUMINAIRE: CAST BROWN PAINTED METAL POST
TOP FITTER WITH 3 FABRICATED BROWN
PAINTED METAL VERTICAL POSTS, 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 5-
DEGREES BELOW THE HORIZON.
TOTAL INPUT WATTS = 89.7 AT 120.0 VOLTS
LED DRIVERS: THREE RAB RDF25U7-02
NOTE: DATA SHOWN IS ABSOLUTE FOR THE
SAMPLE PROVIDED AT RATED INPUT VOLTAGE
(120VAC, 60Hz) TO THE DRIVERS. DRIVER
INFORMATION PROVIDED BY CLIENT.
TEST PROCEDURE: IESNA LM-79-08
TEST DISTANCE = 35.0 FEET

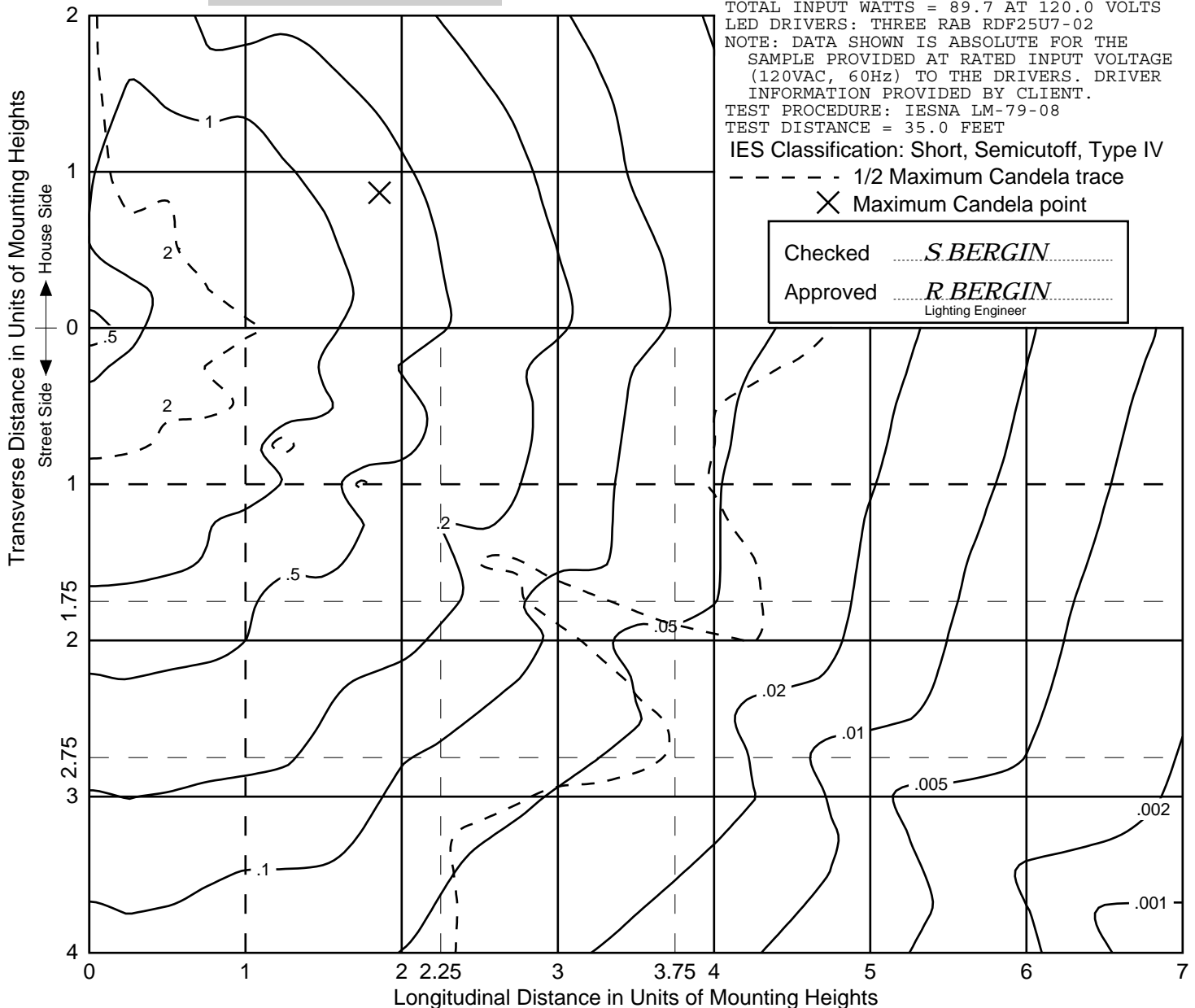
IES Classification: Short, Semicutoff, Type IV

--- 1/2 Maximum Candela trace

X Maximum Candela point

Checked *S. BERGIN*

Approved *R. BERGIN*
Lighting Engineer



REPORT NUMBER: ITL80200

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CATALOG NUMBER: ALED5T78Y (TYPE V)

LUMINAIRE: CAST BROWN PAINTED METAL POST
TOP FITTER WITH 3 FABRICATED BROWN
PAINTED METAL VERTICAL POSTS, 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 5-
DEGREES BELOW THE HORIZON.

TOTAL INPUT WATTS = 89.7 AT 120.0 VOLTS

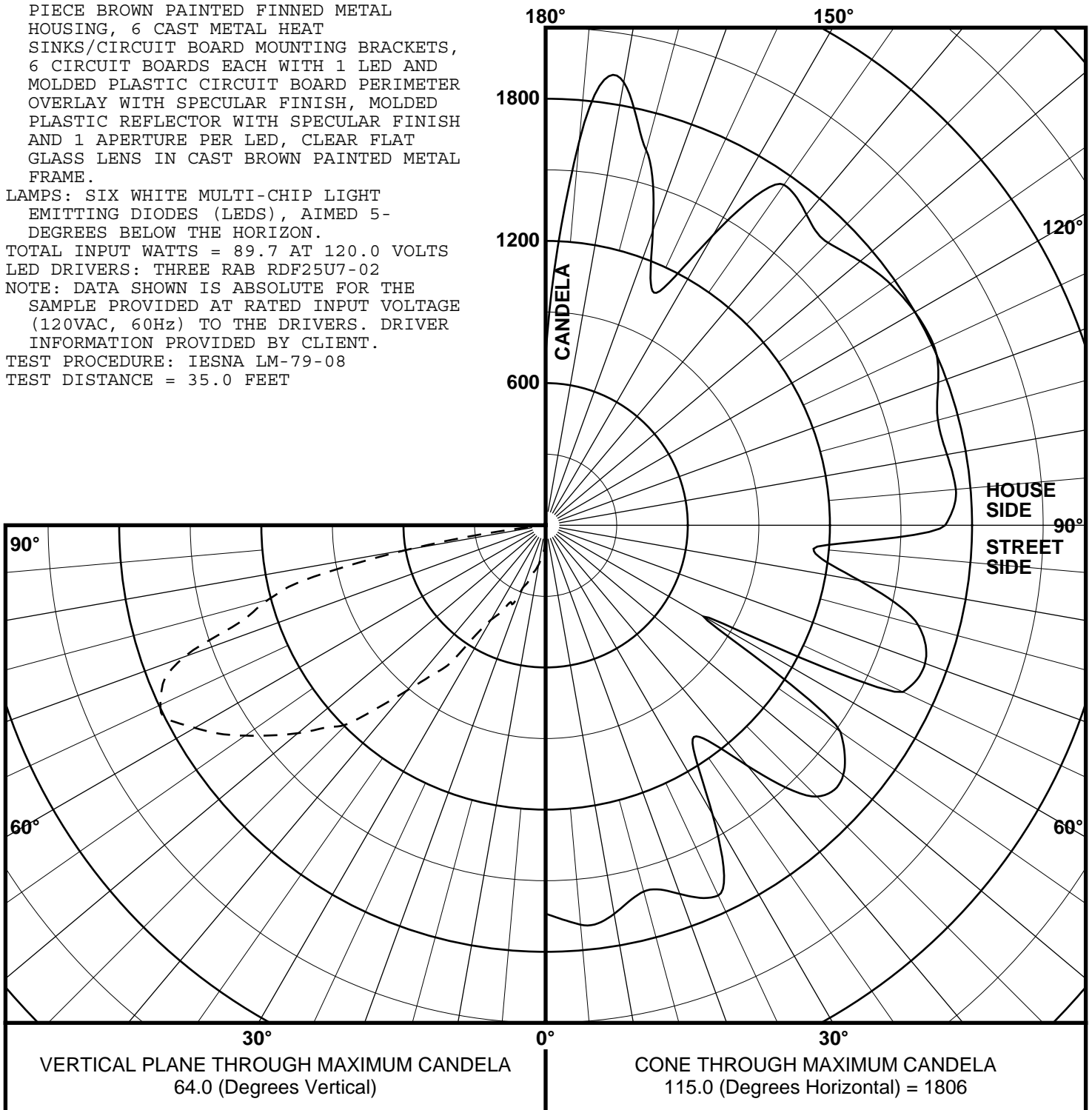
LED DRIVERS: THREE RAB RDF25U7-02

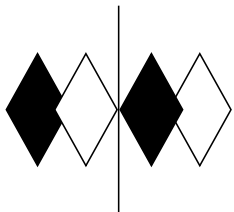
NOTE: DATA SHOWN IS ABSOLUTE FOR THE
SAMPLE PROVIDED AT RATED INPUT VOLTAGE
(120VAC, 60Hz) TO THE DRIVERS. DRIVER
INFORMATION PROVIDED BY CLIENT.

TEST PROCEDURE: IESNA LM-79-08

TEST DISTANCE = 35.0 FEET

MAXIMUM PLANE AND MAXIMUM CONE PLOTS OF CANDELA

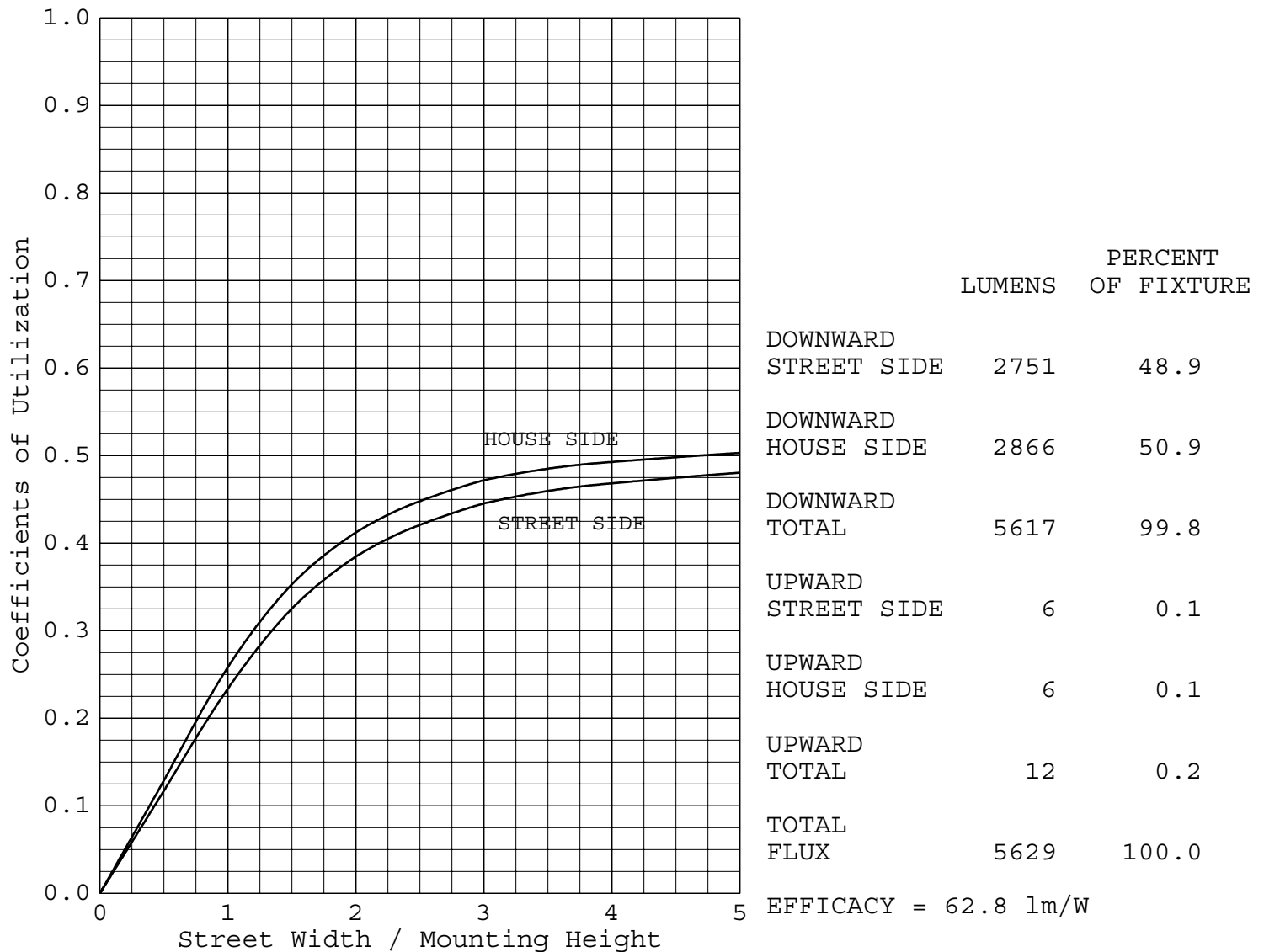




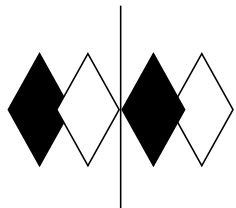
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COEFFICIENTS OF UTILIZATION AND FLUX DISTRIBUTION



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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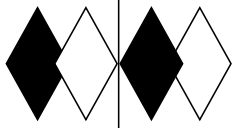
FLUX DISTRIBUTION BY SOLID ANGLE

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

	LUMENS	PERCENT OF FIXTURE	BUG ZONE RATINGS
FORWARD LIGHT	2751.	48.9	
FL (0- 30)	132.8	2.4	
FM (30- 60)	1248.8	22.2	
FH (60- 80)	1297.8	23.1	G1
FVH(80- 90)	71.3	1.3	G1
BACK LIGHT	2866.	50.9	
BL (0- 30)	130.1	2.3	B1
BM (30- 60)	1297.1	23.0	B2
BH (60- 80)	1372.7	24.4	B3 G1
BVH(80- 90)	66.5	1.2	G1
UPLIGHT	12.	0.2	
UL (90-100)	6.6	0.1	U1
UH (100-180)	5.3	0.1	U1
TRAPPED LIGHT	0.	0.0	
TOTAL FLUX	5629.	100.0	

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

BUG RATING: B3 U1 G1



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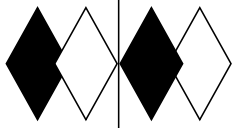
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CANDELA TABULATION

	STREET SIDE					LATERAL ANGLE						
	0.0	5.0	15.0	25.0	35.0	45.0	55.0	60.0	65.0	75.0	85.0	
	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.	1.	1.	0.	0.	1.	1.	1.	1.	0.
	105.0	3.	3.	4.	5.	3.	6.	6.	6.	6.	6.	3.
	95.0	5.	6.	7.	7.	5.	7.	6.	6.	6.	7.	4.
	92.5	7.	7.	7.	7.	5.	6.	6.	6.	6.	6.	4.
	90.0	9.	10.	8.	7.	5.	6.	6.	6.	6.	6.	5.
	87.5	20.	19.	15.	14.	11.	11.	14.	11.	14.	11.	9.
	85.0	60.	44.	39.	41.	29.	30.	28.	23.	31.	27.	27.
V	82.5	245.	221.	224.	255.	197.	197.	175.	79.	179.	174.	185.
E	80.0	557.	622.	591.	777.	532.	517.	530.	249.	524.	489.	563.
R	77.5	978.	1139.	976.	1111.	795.	828.	967.	526.	1026.	817.	831.
T	75.0	1228.	1371.	1118.	1351.	953.	1010.	1167.	658.	1219.	988.	963.
I	72.5	1304.	1402.	1315.	1487.	1090.	1197.	1210.	710.	1277.	1177.	1154.
C	70.0	1426.	1569.	1545.	1668.	1144.	1465.	1480.	822.	1464.	1425.	1203.
A	67.5	1573.	1725.	1708.	1772.	1230.	1662.	1564.	744.	1637.	1677.	1280.
L	65.0	1599.	1684.	1614.	1738.	1108.	1603.	1518.	749.	1636.	1625.	1189.
	64.0<<	1639.	1692.	1600.	1724.	1091.	1619.	1519.	771.	1664.	1628.	1135.
A	62.5	1674.	1688.	1613.	1717.	1075.	1624.	1497.	798.	1661.	1631.	1095.
N	60.0	1657.	1650.	1608.	1743.	1052.	1618.	1433.	790.	1595.	1628.	1083.
G	57.5	1570.	1602.	1555.	1720.	1028.	1584.	1350.	716.	1512.	1588.	1056.
L	55.0	1474.	1532.	1506.	1684.	1033.	1556.	1260.	629.	1418.	1540.	1032.
E	52.5	1429.	1467.	1452.	1622.	1052.	1496.	1171.	588.	1331.	1491.	1033.
	50.0	1382.	1377.	1397.	1492.	1050.	1420.	1063.	559.	1240.	1421.	1007.
	47.5	1317.	1301.	1317.	1294.	1039.	1339.	966.	551.	1164.	1341.	975.
	45.0	1268.	1209.	1209.	1076.	1043.	1242.	912.	546.	1104.	1230.	970.
	42.5	1133.	1079.	1080.	852.	1016.	1124.	839.	509.	1040.	1110.	939.
	40.0	946.	946.	986.	664.	945.	1015.	769.	459.	934.	1016.	886.
	37.5	743.	842.	909.	523.	849.	925.	678.	441.	833.	924.	815.
	35.0	609.	735.	820.	450.	749.	838.	580.	384.	729.	826.	750.
	30.0	454.	463.	592.	367.	658.	644.	410.	309.	524.	643.	605.
	25.0	399.	413.	227.	364.	498.	522.	312.	257.	425.	514.	481.
	20.0	221.	215.	174.	278.	393.	354.	253.	253.	297.	407.	399.
	15.0	199.	193.	199.	171.	196.	181.	183.	191.	194.	208.	193.
	10.0	159.	154.	127.	109.	114.	145.	140.	144.	153.	132.	112.
	5.0	119.	120.	113.	93.	94.	103.	114.	112.	107.	93.	84.
	0.0	58.	58.	58.	58.	58.	58.	58.	58.	58.	58.	58.

CONE OF MAXIMUM CANDELA



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CANDELA TABULATION

	HOUSE SIDE										
	90.0	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.	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	1.	1.	0.	0.	0.	1.	1.	0.	0.	1.	1.
105.0	5.	5.	3.	3.	3.	3.	4.	3.	6.	6.	6.
95.0	5.	7.	7.	6.	6.	7.	7.	4.	7.	6.	6.
92.5	4.	7.	8.	7.	7.	7.	7.	4.	7.	6.	6.
90.0	4.	7.	8.	9.	9.	8.	7.	5.	7.	7.	6.
87.5	10.	12.	14.	19.	18.	14.	12.	11.	10.	13.	12.
85.0	48.	36.	33.	35.	40.	38.	32.	31.	25.	36.	32.
V 82.5	247.	196.	174.	187.	176.	177.	173.	140.	138.	147.	73.
E 80.0	612.	664.	548.	590.	525.	522.	651.	472.	499.	493.	230.
R 77.5	993.	1112.	916.	1001.	1042.	908.	986.	704.	863.	903.	531.
T 75.0	1232.	1279.	1089.	1211.	1234.	1126.	1260.	853.	1023.	1092.	677.
I 72.5	1458.	1472.	1299.	1345.	1315.	1316.	1536.	1075.	1229.	1353.	784.
C 70.0	1627.	1700.	1608.	1624.	1487.	1550.	1605.	1104.	1520.	1482.	783.
A 67.5	1802.	1787.	1790.	1749.	1761.	1764.	1733.	1163.	1730.	1618.	744.
L 65.0	1722.	1748.	1718.	1794.	1766.	1714.	1788.	1104.	1641.	1619.	710.
64.0<<	1687.	1738.	1714.	1806.	1776.	1686.	1754.	1083.	1639.	1625.	722.
A 62.5	1659.	1745.	1711.	1785.	1744.	1668.	1707.	1052.	1647.	1597.	733.
N 60.0	1602.	1772.	1691.	1710.	1654.	1641.	1724.	1010.	1629.	1513.	718.
G 57.5	1503.	1747.	1629.	1636.	1574.	1585.	1711.	1006.	1586.	1420.	680.
L 55.0	1345.	1693.	1552.	1548.	1508.	1517.	1661.	993.	1532.	1326.	604.
E 52.5	1182.	1640.	1474.	1457.	1428.	1453.	1593.	1007.	1468.	1219.	581.
50.0	1039.	1536.	1398.	1365.	1340.	1386.	1471.	1023.	1401.	1136.	564.
47.5	886.	1365.	1307.	1264.	1271.	1308.	1289.	1028.	1324.	1064.	551.
45.0	779.	1162.	1191.	1188.	1164.	1205.	1080.	1010.	1189.	1014.	543.
42.5	709.	933.	1059.	1041.	1048.	1066.	856.	978.	1079.	921.	517.
40.0	623.	736.	971.	910.	921.	984.	680.	913.	1009.	827.	484.
37.5	548.	573.	886.	805.	821.	914.	537.	837.	929.	759.	453.
35.0	484.	460.	796.	723.	743.	846.	461.	748.	825.	663.	393.
30.0	493.	379.	636.	460.	469.	622.	411.	625.	654.	479.	317.
25.0	466.	323.	295.	361.	389.	258.	380.	512.	553.	384.	287.
20.0	309.	246.	181.	280.	250.	178.	305.	408.	440.	303.	266.
15.0	176.	183.	212.	210.	216.	182.	174.	237.	210.	198.	195.
10.0	112.	123.	157.	168.	175.	134.	116.	115.	144.	147.	149.
5.0	90.	101.	116.	121.	119.	101.	85.	89.	97.	108.	109.
0.0	58.	58.	58.	58.	58.	58.	58.	58.	58.	58.	58.

||
PLANE OF MAXIMUM CANDELA

CONE OF MAXIMUM CANDELA



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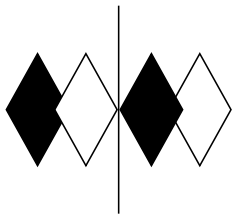
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5-DEGREE
ZONAL LUMEN SUMMARY

0- 5	2
5- 10	8
10- 15	20
15- 20	40
20- 25	74
25- 30	119
30- 35	178
35- 40	261
40- 45	364
45- 50	481
50- 55	585
55- 60	677
60- 65	749
65- 70	787
70- 75	667
75- 80	468
80- 85	129
85- 90	9
90- 95	4
95-100	3
100-105	3
105-110	2
110-115	1
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	10
0- 20	71
0- 30	263
0- 40	702
0- 50	1547
0- 60	2809
0- 70	4344
0- 80	5479
0- 90	5617
0-100	5624
0-110	5628
0-120	5629
0-130	5629
0-140	5629
0-150	5629
0-160	5629
0-170	5629
0-180	5629



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ADDRESS: 170 LUDLOW AVE
NORTHVALE, NJ 07647

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REPORT NUMBER: ITL80203
DATE: 12/24/13
PREPARED FOR: RAB LIGHTING, INC.
CATALOG NUMBER: ALED5T78Y (TYPE V)

ADDRESS: 170 LUDLOW AVE
NORTHVALE, NJ 07647

LUMINAIRE: CAST BROWN PAINTED METAL POST TOP FITTER WITH 3 FABRICATED BROWN PAINTED METAL VERTICAL POSTS, 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 5-DEGREES BELOW THE HORIZON.

DRIVERS: THREE RAB RDF25U7-02

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

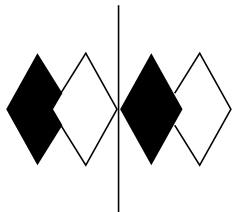
PROCEDURE: The test sample was provided by the customer and had an unknown number of operating hours. The test sample was mounted inside the integrating sphere and allowed to stabilize. After stabilization occurred, measurements were taken. In order to measure mean performance, multiple data sets were 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	<i>N THOMAS</i>
Approved	<i>P O'CONNOR</i>
	SPHERE LAB SUPERVISOR



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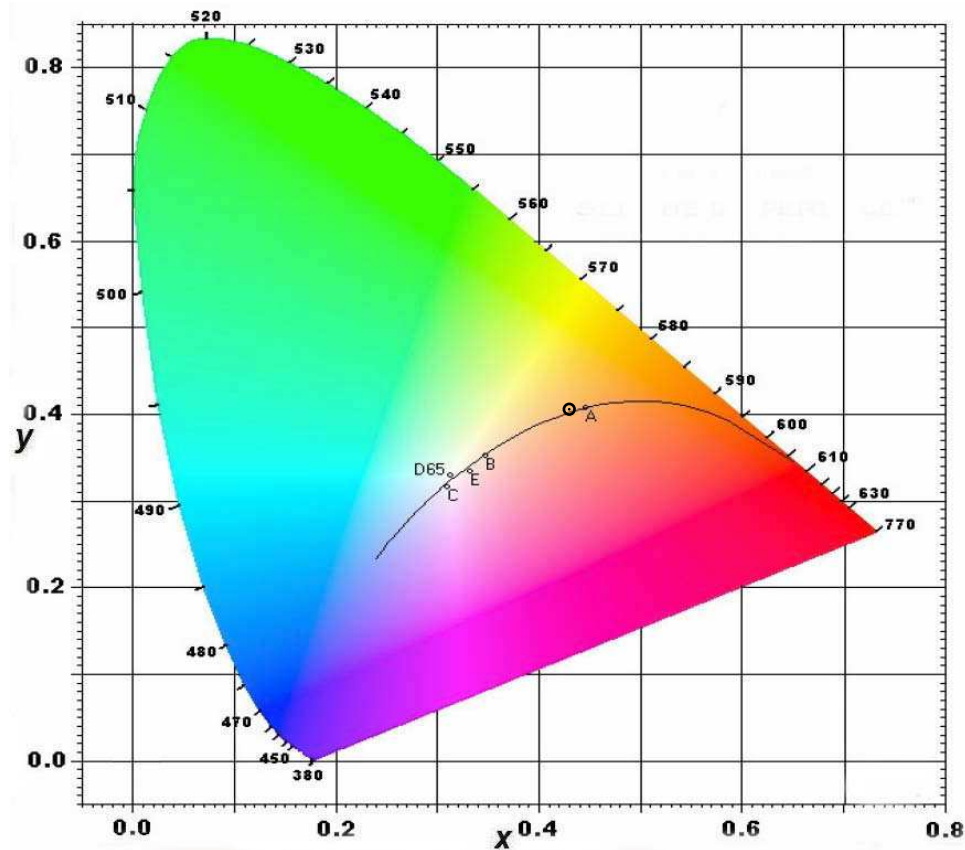
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CIE Chromaticity Diagram





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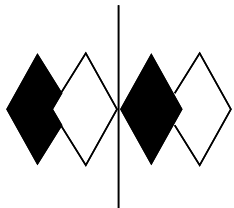
RESULTS:

SPECTRORADIOMETRIC	
Observer	CIE 1931 2 degree
Chromaticity Ordinate x	0.4297
Chromaticity Ordinate y	0.4054
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2453
Chromaticity Ordinate v'	0.5208
Correlated Color Temp CCT (K)	3136
ANSI C78.377-2008 Duv	0.002
Total Radiant Flux (milliWatts)	16631 *
ELECTRICAL	
Input Voltage (Volts AC)	120.0
Input Current (Amps AC)	0.752
Input Power (Watts)	89.8
Input Power Factor (%)	99.5
Input Current THD (%)	7.8
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)	0.355
Input Power (Watts)	89.3
Input Power Factor (%)	90.8
Input Current THD (%)	11.3
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	79
R6 Light blue	86
R7 Light violet	83
R8 Light reddish purple	58
R9 Strong red	-1
R10 Strong yellow	73
R11 Strong green	80
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	0.295	515	53.325	650	60.454
385	0.298	520	57.677	655	53.838
390	0.299	525	60.957	660	47.561
395	0.330	530	63.438	665	41.820
400	0.411	535	65.300	670	36.522
405	0.575	540	67.119	675	31.757
410	0.925	545	69.038	680	27.509
415	1.650	550	71.503	685	23.735
420	3.142	555	74.510	690	20.460
425	6.073	560	78.314	695	17.599
430	11.369	565	83.138	700	15.021
435	19.754	570	88.336	705	12.860
440	32.918	575	93.974	710	10.989
445	52.375	580	99.401	715	9.379
450	64.729	585	104.442	720	7.989
455	54.899	590	108.487	725	6.793
460	38.959	595	111.191	730	5.789
465	29.155	600	112.367	735	4.920
470	22.551	605	111.869	740	4.189
475	18.191	610	109.848	745	3.576
480	17.054	615	106.202	750	3.066
485	18.611	620	101.420	755	2.617
490	22.218	625	95.533	760	2.242
495	27.744	630	88.848	765	1.909
500	34.518	635	81.818	770	1.641
505	41.473	640	74.670	775	1.414
510	47.913	645	67.510	780	1.211

