



itl boulder
THE LIGHT CENTER OF THE INDUSTRY SINCE 1955

PHONE: (303) 442-1255

FAX: (970) 535-3114

E-MAIL: itl@itlboulder.com

WEBSITE: www.itlboulder.com

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 15 foot mounting height.



REPORT NUMBER: ITL80194

ISSUE DATE: 12/17/13 PAGE: 1 OF 8

PREPARED FOR: RAB LIGHTING, INC.

CATALOG NUMBER: ALED5T52Y (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, 4 CAST METAL HEAT SINKS/CIRCUIT BOARD MOUNTING BRACKETS, 4 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: FOUR WHITE MULTI-CHIP LIGHT EMITTING DIODES (LEDs), AIMED 5-DEGREES BELOW THE HORIZON.

TOTAL INPUT WATTS = 59.4 AT 120.0 VOLTS
LED DRIVERS: TWO 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

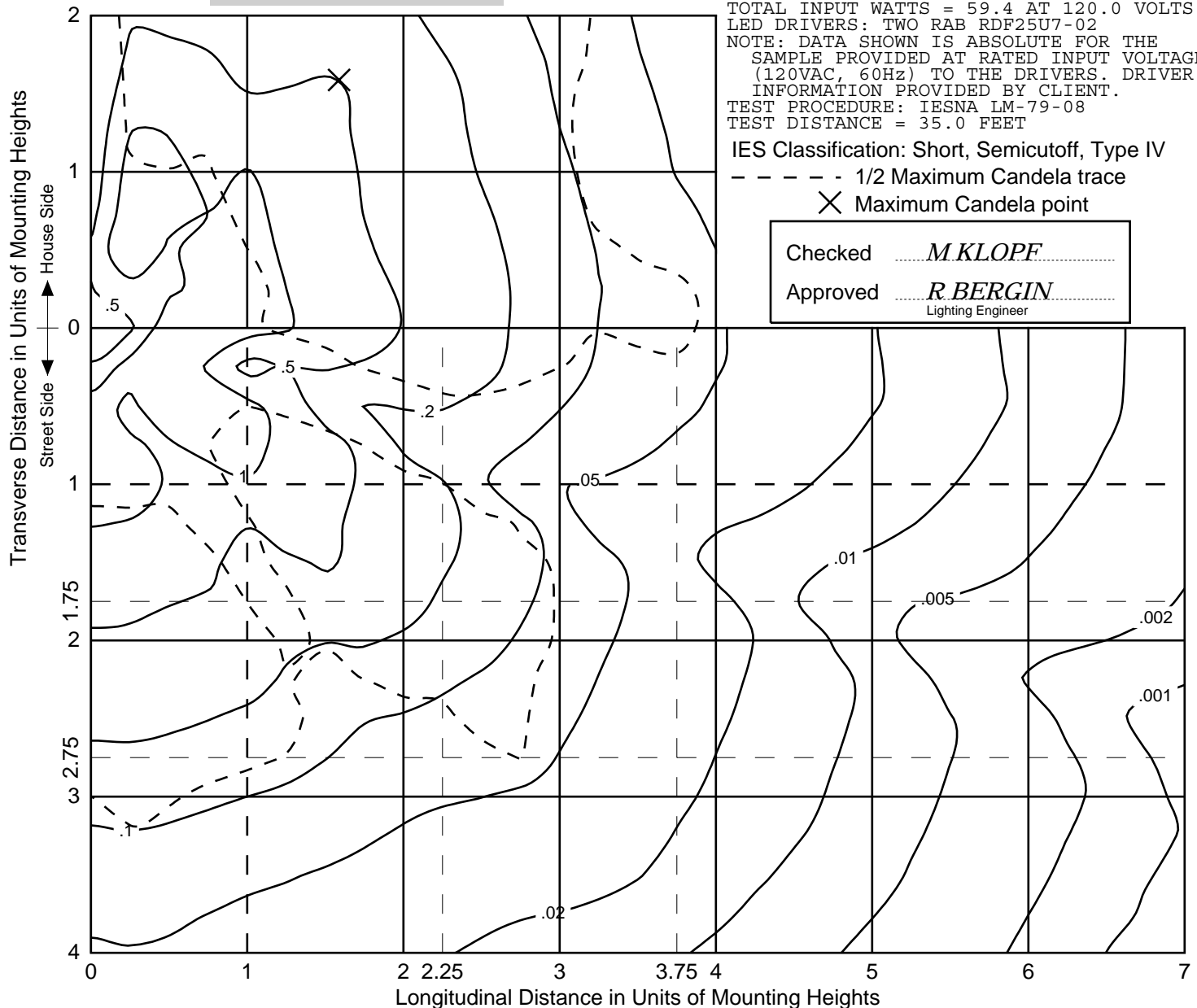
IES Classification: Short, Semicutoff, Type IV

--- 1/2 Maximum Candela trace

X Maximum Candela point

Checked M. KLOPF

Approved R. BERGIN
Lighting Engineer



REPORT NUMBER: ITL80194

ISSUE DATE: 12/17/13 PAGE: 2 OF 8

PREPARED FOR: RAB LIGHTING, INC.

CATALOG NUMBER: ALED5T52Y (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, 4 CAST METAL HEAT
SINKS/CIRCUIT BOARD MOUNTING BRACKETS,
4 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: FOUR WHITE MULTI-CHIP LIGHT
EMITTING DIODES (LEDs), AIMED 5-
DEGREES BELOW THE HORIZON.

TOTAL INPUT WATTS = 59.4 AT 120.0 VOLTS

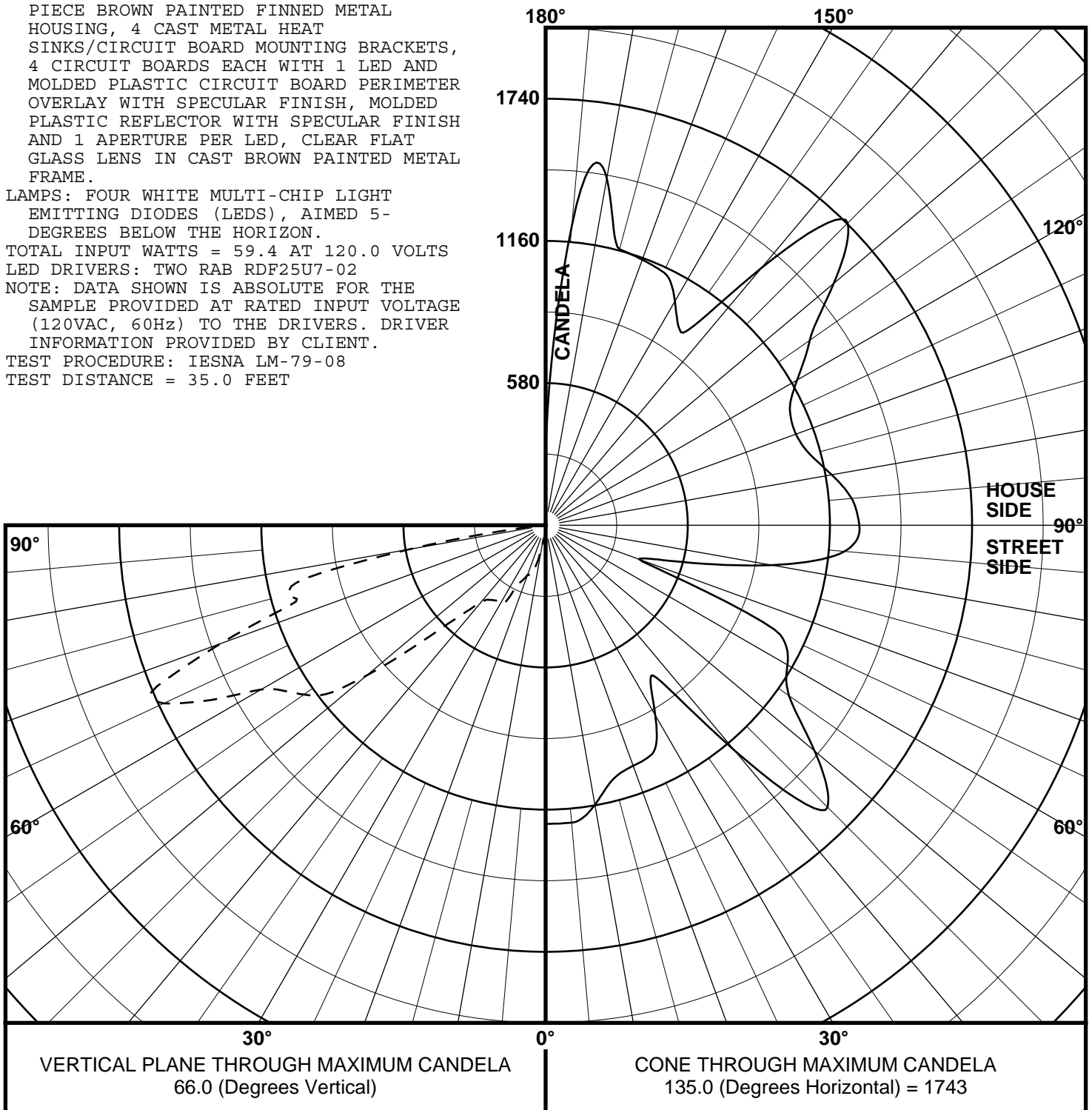
LED DRIVERS: TWO RAB RDF25U7-02

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

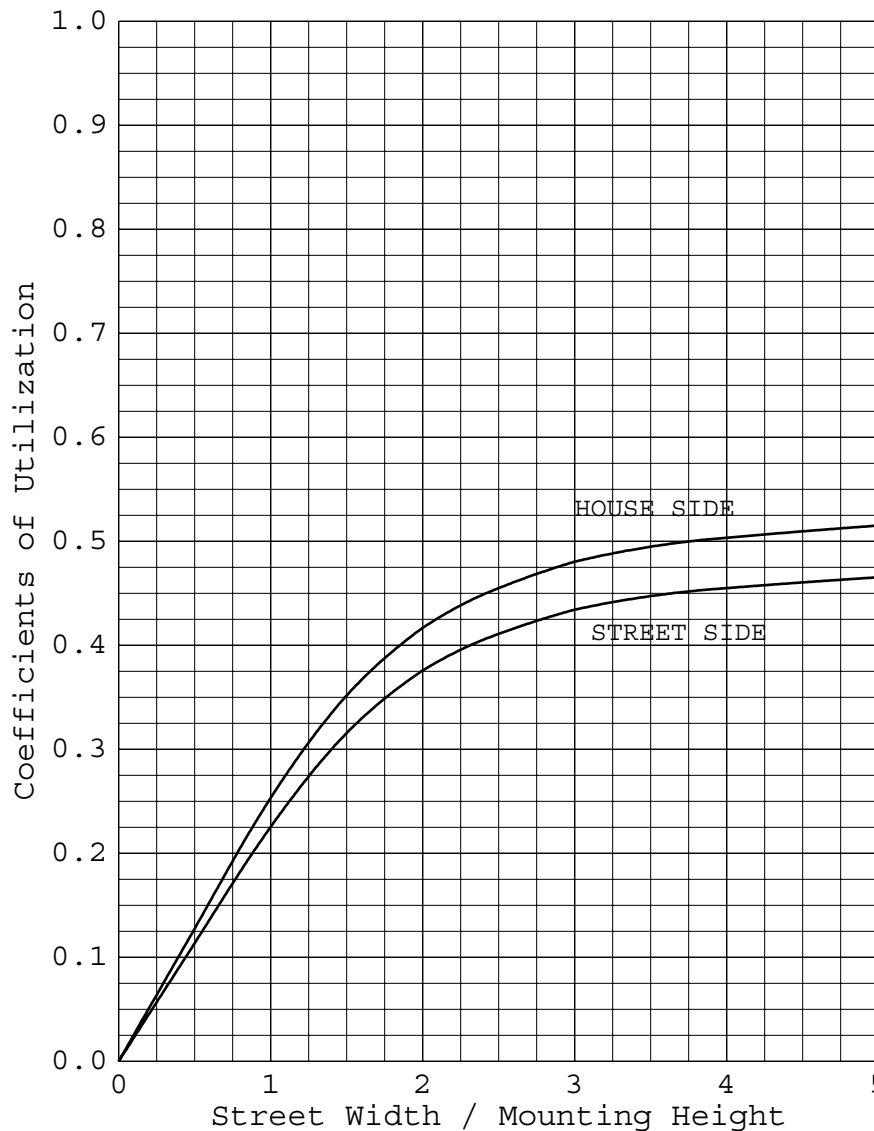




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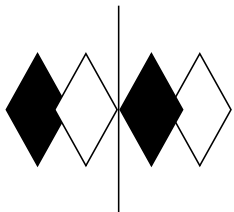
COEFFICIENTS OF UTILIZATION AND FLUX DISTRIBUTION



	LUMENS	PERCENT OF FIXTURE
DOWNWARD STREET SIDE	1845	47.3
DOWNWARD HOUSE SIDE	2046	52.5
DOWNWARD TOTAL	3892	99.8
UPWARD STREET SIDE	4	0.1
UPWARD HOUSE SIDE	4	0.1
UPWARD TOTAL	9	0.2
TOTAL FLUX	3900	100.0

EFFICACY = 65.7 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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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	1845.	47.3	
FL (0- 30)	111.4	2.9	
FM (30- 60)	817.0	20.9	
FH (60- 80)	870.8	22.3	G1
FVH(80- 90)	46.3	1.2	G1
BACK LIGHT	2046.	52.5	
BL (0- 30)	101.0	2.6	B0
BM (30- 60)	886.9	22.7	B1
BH (60- 80)	994.4	25.5	B2 G1
BVH(80- 90)	63.8	1.6	G1
UPLIGHT	9.	0.2	
UL (90-100)	4.7	0.1	U1
UH (100-180)	3.9	0.1	U1
TRAPPED LIGHT	0.	0.0	
TOTAL FLUX	3900.	100.0	

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

BUG RATING: B2 U1 G1



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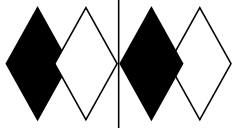
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CANDELA TABULATION

	STREET SIDE										
	0.0	5.0	15.0	25.0	35.0	45.0	55.0	65.0	70.0	75.0	85.0
	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	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	155.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	145.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	135.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	125.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	115.0	1.	1.	1.	1.	0.	0.	1.	1.	1.	0.
	105.0	2.	2.	2.	3.	2.	4.	4.	4.	5.	5.
	95.0	3.	4.	5.	5.	3.	5.	5.	5.	5.	3.
	92.5	5.	5.	5.	5.	3.	5.	5.	4.	5.	5.
	90.0	6.	6.	6.	5.	3.	4.	4.	4.	4.	4.
	87.5	11.	11.	7.	6.	5.	7.	6.	6.	6.	6.
	85.0	50.	29.	19.	14.	20.	21.	19.	14.	14.	17.
V	82.5	171.	185.	118.	82.	88.	93.	102.	106.	51.	127.
E	80.0	534.	613.	395.	316.	319.	376.	406.	340.	139.	316.
R	77.5	756.	794.	551.	501.	501.	764.	621.	526.	258.	446.
T	75.0	725.	767.	665.	667.	662.	908.	818.	714.	304.	546.
I	72.5	832.	881.	811.	829.	757.	902.	1061.	868.	335.	605.
C	70.0	935.	987.	970.	947.	781.	1186.	1182.	972.	381.	652.
A	67.5	1127.	1124.	1050.	996.	763.	1556.	1208.	1027.	383.	617.
L	66.0<<	1218.	1218.	1071.	1029.	750.	1627.	1213.	1057.	406.	580.
	65.0	1183.	1186.	1051.	1036.	715.	1600.	1226.	1073.	413.	515.
A	62.5	1130.	1143.	1041.	1050.	636.	1438.	1266.	1086.	460.	411.
N	60.0	1082.	1094.	1031.	1048.	590.	1270.	1265.	1088.	525.	329.
G	57.5	1047.	1046.	1007.	1050.	548.	1190.	1226.	1094.	575.	269.
L	55.0	990.	990.	975.	1015.	502.	1143.	1137.	1063.	615.	209.
E	52.5	958.	956.	949.	958.	487.	1103.	1048.	1003.	646.	177.
	50.0	925.	917.	900.	860.	501.	1027.	970.	927.	671.	169.
	47.5	857.	845.	820.	742.	513.	913.	902.	839.	649.	162.
	45.0	779.	756.	731.	603.	523.	789.	838.	766.	616.	155.
	42.5	668.	661.	659.	487.	513.	697.	754.	717.	583.	160.
	40.0	590.	587.	599.	392.	509.	640.	653.	665.	571.	182.
	37.5	546.	549.	561.	303.	512.	614.	595.	581.	528.	203.
	35.0	474.	498.	507.	247.	507.	578.	568.	536.	477.	215.
	30.0	420.	419.	443.	261.	521.	498.	521.	526.	492.	309.
	25.0	393.	372.	269.	262.	405.	413.	421.	436.	425.	321.
	20.0	233.	259.	186.	230.	280.	339.	330.	327.	313.	279.
	15.0	156.	155.	143.	158.	211.	199.	233.	177.	148.	123.
	10.0	84.	83.	86.	87.	86.	97.	95.	89.	84.	86.
	5.0	40.	40.	42.	44.	49.	55.	45.	39.	38.	38.
	0.0	29.	29.	29.	29.	29.	29.	29.	29.	29.	29.

CONE OF MAXIMUM CANDELA



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CANDELA TABULATION

HOUSE SIDE		LATERAL ANGLE										
		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.	1.	1.	1.	1.	1.	0.	0.	1.	1.
	105.0	3.	3.	2.	2.	2.	2.	3.	2.	4.	4.	4.
	95.0	4.	5.	4.	4.	4.	5.	5.	3.	5.	4.	4.
	92.5	3.	5.	5.	5.	6.	5.	5.	3.	4.	4.	4.
	90.0	3.	5.	6.	6.	7.	6.	4.	3.	4.	4.	4.
	87.5	9.	10.	9.	11.	12.	14.	9.	7.	7.	12.	9.
	85.0	32.	32.	26.	29.	37.	51.	37.	27.	26.	47.	36.
V	82.5	222.	212.	184.	165.	173.	185.	201.	192.	210.	264.	104.
E	80.0	483.	482.	420.	386.	511.	565.	444.	402.	403.	589.	257.
R	77.5	733.	780.	596.	578.	740.	1003.	608.	579.	539.	866.	352.
T	75.0	906.	891.	737.	790.	921.	1086.	767.	812.	657.	866.	321.
I	72.5	871.	914.	890.	923.	1127.	1102.	953.	946.	803.	884.	321.
C	70.0	994.	1032.	1017.	1008.	1266.	1411.	1017.	1046.	978.	1004.	259.
A	67.5	1169.	1173.	1116.	1082.	1334.	1716.	994.	1113.	1142.	1179.	295.
L	66.0<<	1280.	1253.	1117.	1100.	1316.	1743.	962.	1139.	1166.	1227.	280.
	65.0	1266.	1227.	1089.	1110.	1307.	1720.	965.	1152.	1158.	1197.	210.
A	62.5	1209.	1198.	1080.	1103.	1315.	1545.	976.	1149.	1142.	1108.	135.
N	60.0	1120.	1139.	1063.	1099.	1296.	1341.	970.	1129.	1123.	1035.	127.
G	57.5	1068.	1083.	1028.	1095.	1231.	1259.	922.	1120.	1097.	965.	134.
L	55.0	1017.	1019.	999.	1056.	1128.	1204.	856.	1081.	1072.	895.	130.
E	52.5	985.	979.	966.	1001.	1042.	1133.	796.	1017.	1032.	845.	132.
	50.0	942.	934.	909.	925.	968.	954.	750.	941.	972.	774.	139.
	47.5	867.	862.	829.	829.	897.	749.	759.	844.	875.	687.	130.
	45.0	779.	770.	734.	716.	815.	578.	725.	774.	792.	586.	123.
	42.5	687.	676.	655.	643.	721.	478.	654.	730.	726.	496.	109.
	40.0	628.	630.	623.	584.	625.	408.	618.	663.	683.	442.	104.
	37.5	624.	637.	576.	473.	565.	383.	579.	595.	601.	428.	136.
	35.0	574.	578.	498.	401.	446.	373.	557.	570.	547.	399.	173.
	30.0	536.	533.	441.	332.	185.	368.	521.	527.	517.	351.	208.
	25.0	393.	377.	335.	265.	123.	264.	405.	436.	439.	281.	193.
	20.0	155.	183.	247.	174.	212.	216.	221.	305.	300.	191.	178.
	15.0	104.	116.	130.	153.	190.	189.	160.	158.	146.	134.	130.
	10.0	72.	71.	71.	82.	76.	88.	79.	74.	64.	61.	62.
	5.0	41.	41.	40.	39.	41.	47.	49.	38.	36.	36.	36.
	0.0	29.	29.	29.	29.	29.	29.	29.	29.	29.	29.	29.
		PLANE OF MAXIMUM CANDELA										
		CONE OF MAXIMUM CANDELA										



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5-DEGREE
ZONAL LUMEN SUMMARY

0- 5	1
5- 10	4
10- 15	15
15- 20	33
20- 25	62
25- 30	98
30- 35	133
35- 40	174
40- 45	230
45- 50	312
50- 55	393
55- 60	462
60- 65	526
65- 70	550
70- 75	459
75- 80	330
80- 85	103
85- 90	7
90- 95	2
95-100	2
100-105	2
105-110	1
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	5
0- 20	53
0- 30	212
0- 40	519
0- 50	1061
0- 60	1916
0- 70	2992
0- 80	3781
0- 90	3892
0-100	3896
0-110	3899
0-120	3900
0-130	3900
0-140	3900
0-150	3900
0-160	3900
0-170	3900
0-180	3900



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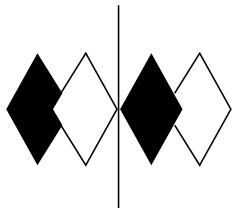
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ADDRESS: 170 LUDLOW AVE
NORTHVALE, NJ 07647

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REPORT NUMBER: ITL80197
DATE: 12/24/13
PREPARED FOR: RAB LIGHTING, INC.
CATALOG NUMBER: ALED5T52Y (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, 4 CAST METAL HEAT SINKS/CIRCUIT BOARD MOUNTING BRACKETS, 4 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: FOUR WHITE MULTI-CHIP LIGHT EMITTING DIODES (LEDs), AIMED 5-DEGREES BELOW THE HORIZON.

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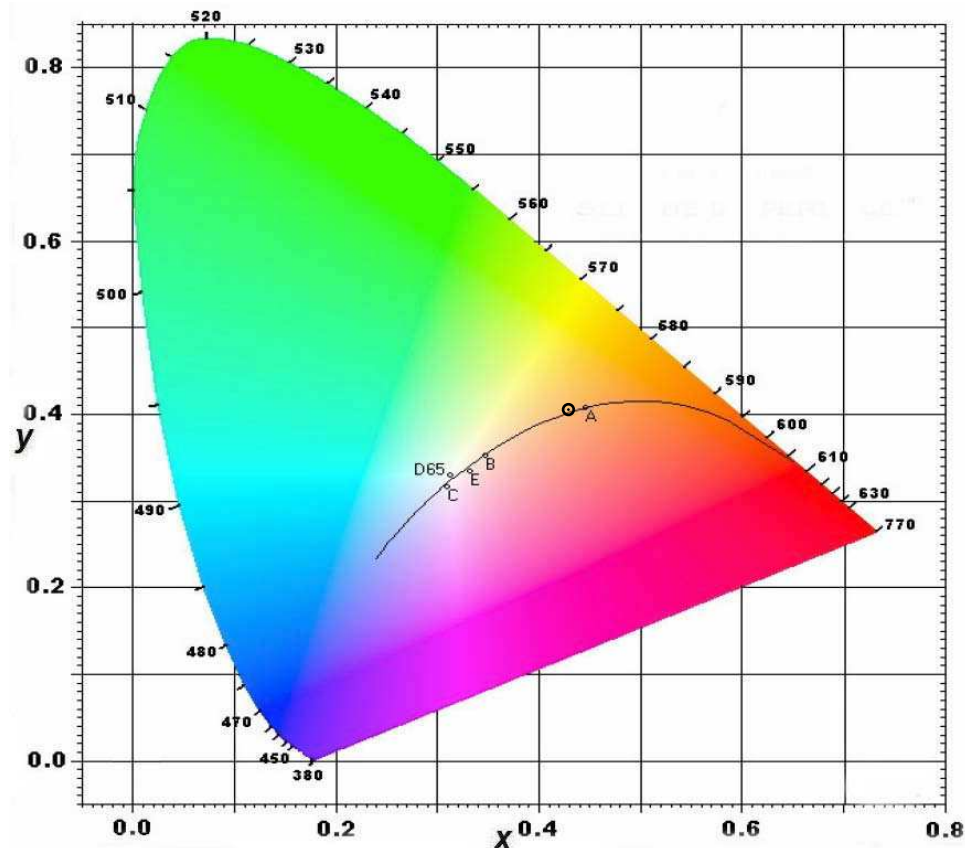
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INDEPENDENT TESTING LABORATORIES, INC.
4066 CAMELOT CIRCLE, LONGMONT, CO 80504 USA

PHONE: (303)442-1255 • FAX: (970)535-3114 • E-MAIL: itl@itlboulder.com • WEBSITE: www.itlboulder.com
REPORT NUMBER: ITL80197
DATE: 12/24/13
PREPARED FOR: RAB LIGHTING, INC.
CATALOG NUMBER: ALED5T52Y (TYPE V)

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CIE Chromaticity Diagram



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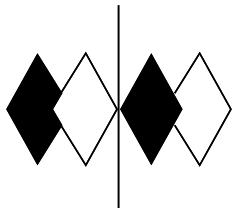
RESULTS:

SPECTRORADIOMETRIC	
Observer	CIE 1931 2 degree
Chromaticity Ordinate x	0.4289
Chromaticity Ordinate y	0.4050
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2450
Chromaticity Ordinate v'	0.5206
Correlated Color Temp CCT (K)	3147
ANSI C78.377-2008 Duv	0.002
Total Radiant Flux (milliWatts)	11519 *
ELECTRICAL	
Input Voltage (Volts AC)	120.0
Input Current (Amps AC)	0.497
Input Power (Watts)	59.3
Input Power Factor (%)	99.4
Input Current THD (%)	7.6
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)	0.236
Input Power (Watts)	59.1
Input Power Factor (%)	90.4
Input Current THD (%)	10.8
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	72
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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NVLAP
NVLAP LAB CODE: 200925-0

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RESULTS:

Wavelength	mW per nm	Wavelength	mW per nm	Wavelength	mW per nm
380	0.214	515	37.202	650	41.774
385	0.210	520	40.223	655	37.167
390	0.070	525	42.483	660	32.840
395	0.235	530	44.219	665	28.833
400	0.295	535	45.493	670	25.169
405	0.408	540	46.683	675	21.883
410	0.655	545	47.995	680	18.948
415	1.159	550	49.618	685	16.347
420	2.188	555	51.643	690	14.073
425	4.284	560	54.251	695	12.073
430	8.052	565	57.483	700	10.330
435	14.084	570	61.050	705	8.838
440	23.739	575	64.908	710	7.538
445	37.746	580	68.705	715	6.418
450	45.611	585	72.199	720	5.473
455	37.706	590	74.922	725	4.657
460	26.427	595	76.830	730	3.951
465	19.782	600	77.669	735	3.361
470	15.232	605	77.421	740	2.861
475	12.283	610	76.020	745	2.437
480	11.597	615	73.500	750	2.090
485	12.766	620	70.128	755	1.792
490	15.311	625	66.064	760	1.525
495	19.223	630	61.479	765	1.306
500	24.031	635	56.603	770	1.121
505	28.876	640	51.652	775	0.961
510	33.398	645	46.621	780	0.826

