



itl boulder
THE LIGHT CENTER OF THE INDUSTRY SINCE 1955

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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: ITL80195

ISSUE DATE: 12/18/13

PAGE: 1 OF 8

PREPARED FOR: RAB LIGHTING, INC.

CATALOG NUMBER: ALED5T52N (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 = 59.0 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

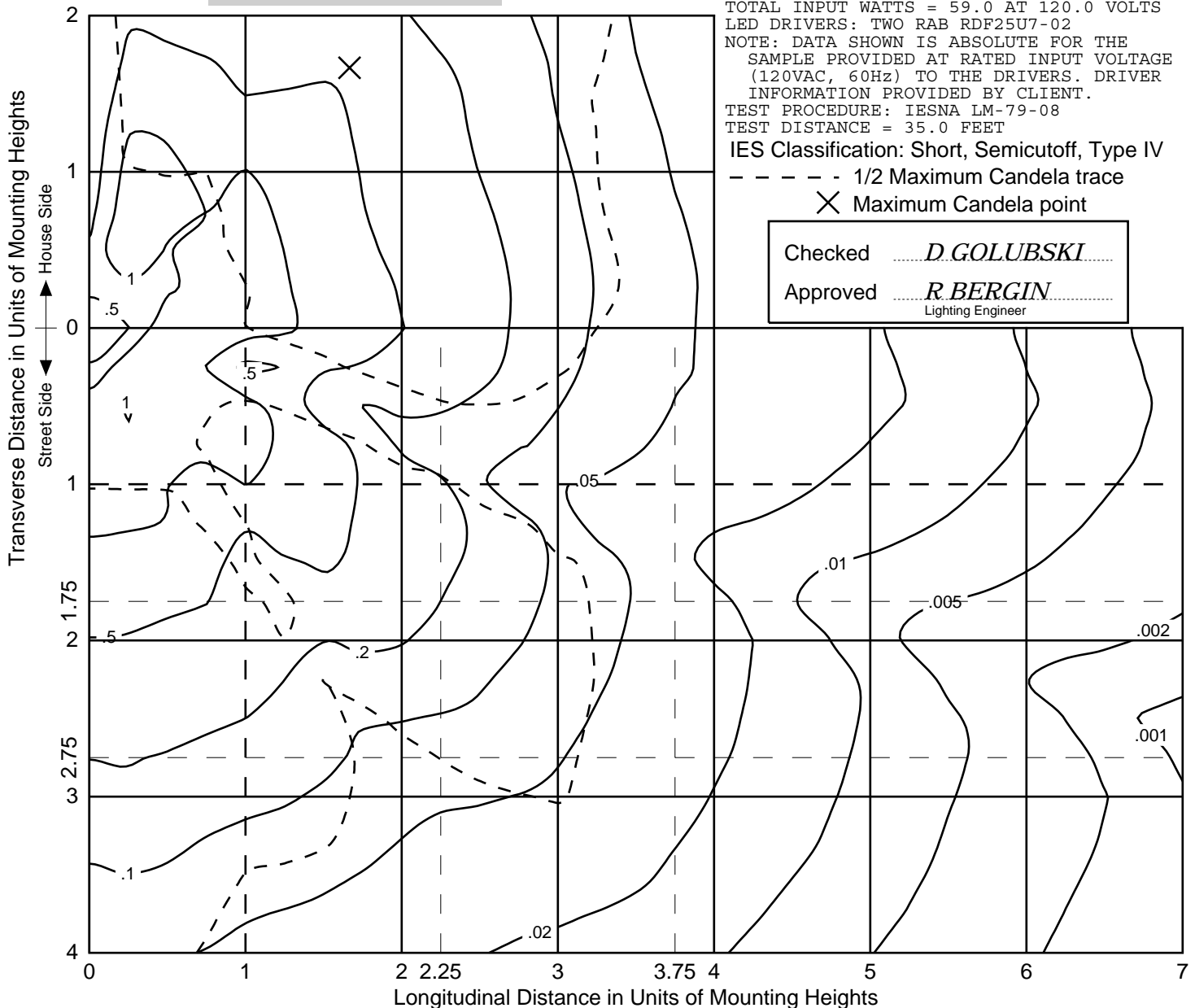
IES Classification: Short, Semicutoff, Type IV

--- 1/2 Maximum Candela trace

X Maximum Candela point

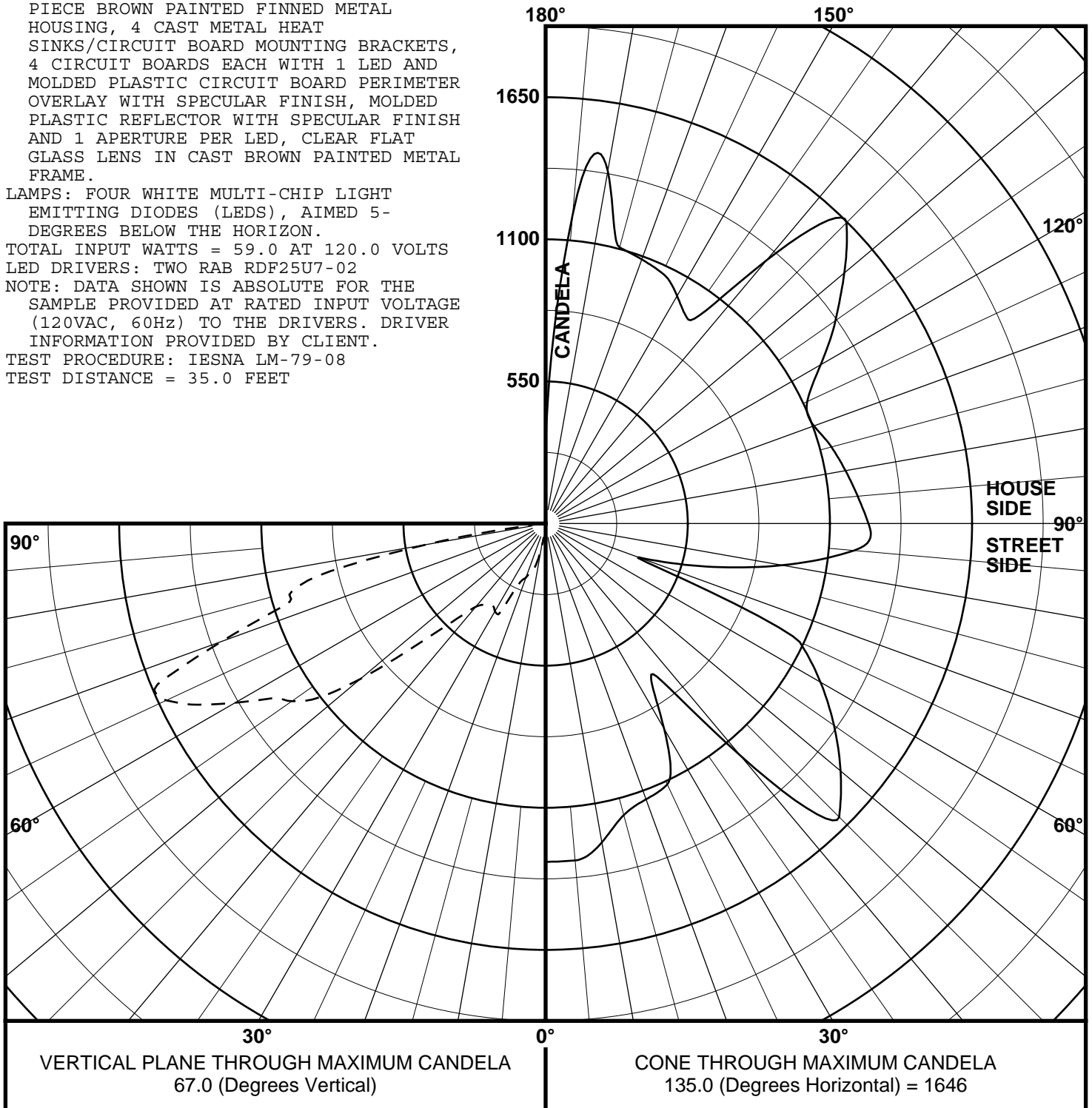
Checked D. GOLUBSKI

Approved R. BERGIN
Lighting Engineer



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PREPARED FOR: RAB LIGHTING, INC.
CATALOG NUMBER: ALED5T52N (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 = 59.0 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

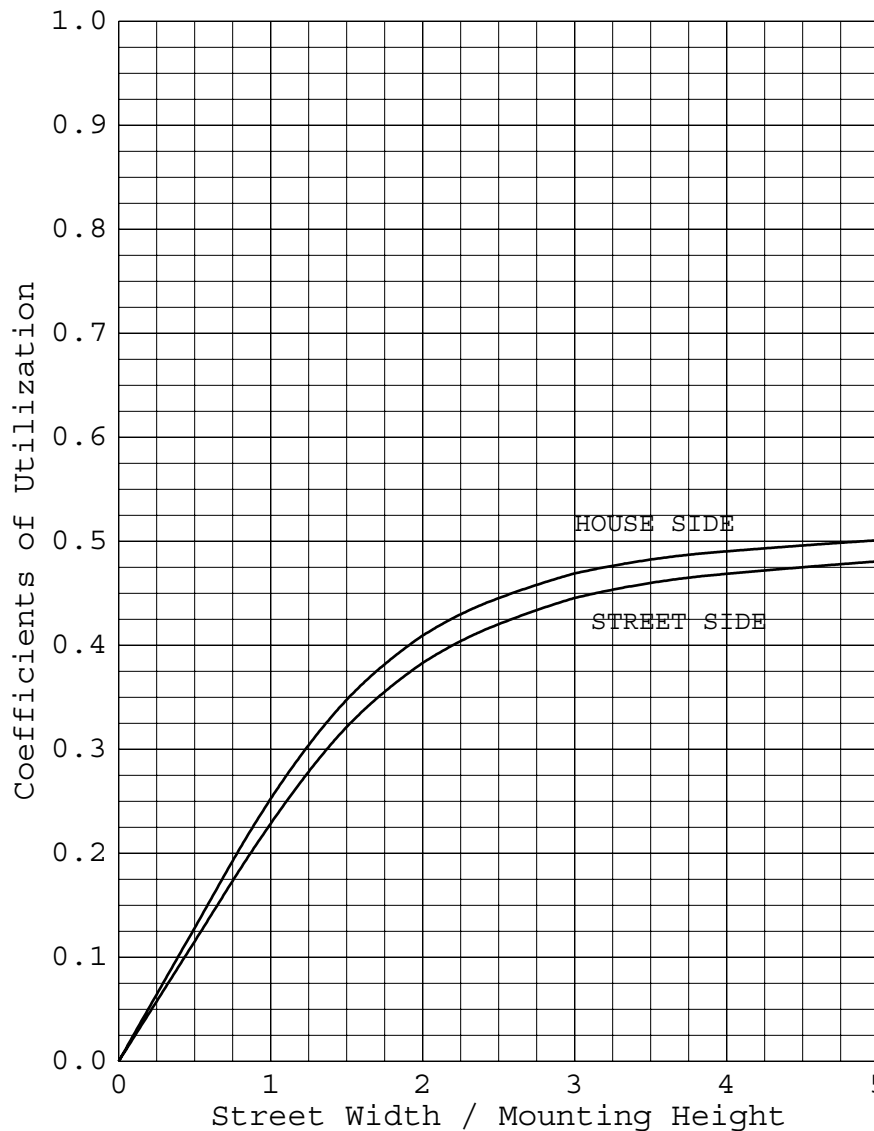




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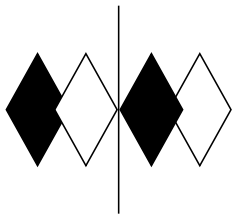
COEFFICIENTS OF UTILIZATION AND FLUX DISTRIBUTION



	LUMENS	PERCENT OF FIXTURE
DOWNWARD STREET SIDE	1968	49.0
DOWNWARD HOUSE SIDE	2042	50.8
DOWNWARD TOTAL	4010	99.8
UPWARD STREET SIDE	5	0.1
UPWARD HOUSE SIDE	4	0.1
UPWARD TOTAL	9	0.2
TOTAL FLUX	4019	100.0

EFFICACY = 68.1 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	1968.	49.0	
FL (0- 30)	119.4	3.0	
FM (30- 60)	861.0	21.4	
FH (60- 80)	930.8	23.2	G1
FVH(80- 90)	56.9	1.4	G1
BACK LIGHT	2042.	50.8	
BL (0- 30)	105.9	2.6	B0
BM (30- 60)	901.9	22.4	B1
BH (60- 80)	978.6	24.3	B2 G1
BVH(80- 90)	56.0	1.4	G1
UPLIGHT	9.	0.2	
UL (90-100)	4.7	0.1	U1
UH (100-180)	4.2	0.1	U1
TRAPPED LIGHT	0.	0.0	
TOTAL FLUX	4019.	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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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.	1.	1.	1.	1.	0.
	105.0	2.	2.	3.	3.	2.	5.	4.	4.	4.	2.
	95.0	4.	4.	5.	5.	3.	5.	5.	5.	5.	3.
	92.5	5.	5.	6.	5.	3.	5.	5.	4.	5.	3.
	90.0	7.	7.	6.	5.	3.	4.	4.	4.	4.	3.
	87.5	25.	24.	11.	8.	7.	10.	7.	7.	7.	9.
	85.0	48.	52.	29.	25.	28.	36.	29.	20.	18.	42.
V	82.5	241.	235.	184.	145.	124.	141.	146.	139.	60.	245.
E	80.0	483.	531.	448.	385.	396.	451.	447.	360.	148.	635.
R	77.5	747.	783.	635.	546.	555.	782.	683.	528.	252.	807.
T	75.0	858.	1030.	795.	807.	679.	966.	887.	737.	286.	696.
I	72.5	1163.	1248.	948.	972.	769.	1053.	1158.	908.	325.	784.
C	70.0	1138.	1187.	1069.	1053.	790.	1314.	1265.	1017.	366.	953.
A	67.5	1269.	1275.	1150.	1104.	729.	1581.	1351.	1076.	377.	1160.
L	67.0<<	1309.	1309.	1168.	1114.	713.	1606.	1362.	1085.	383.	1198.
	65.0	1297.	1287.	1156.	1140.	660.	1614.	1361.	1103.	400.	1274.
A	62.5	1193.	1201.	1127.	1143.	631.	1538.	1325.	1106.	430.	1222.
N	60.0	1140.	1163.	1106.	1145.	600.	1383.	1313.	1114.	490.	1149.
G	57.5	1101.	1115.	1084.	1143.	554.	1246.	1267.	1122.	545.	1105.
L	55.0	1057.	1070.	1050.	1096.	498.	1193.	1171.	1093.	584.	1059.
E	52.5	1033.	1039.	1010.	1034.	487.	1133.	1089.	1046.	625.	1035.
	50.0	985.	979.	941.	940.	514.	1039.	1013.	965.	647.	990.
	47.5	899.	899.	848.	785.	538.	932.	948.	880.	652.	912.
	45.0	798.	798.	760.	625.	564.	829.	873.	812.	634.	813.
	42.5	703.	704.	699.	482.	590.	749.	782.	758.	611.	722.
	40.0	640.	641.	661.	345.	601.	684.	712.	707.	593.	669.
	37.5	599.	609.	600.	268.	579.	639.	667.	634.	565.	665.
	35.0	514.	544.	551.	252.	558.	618.	637.	583.	514.	608.
	30.0	467.	465.	486.	285.	551.	536.	592.	549.	504.	489.
	25.0	435.	422.	237.	278.	441.	457.	465.	468.	433.	317.
	20.0	207.	229.	204.	282.	326.	369.	349.	324.	298.	155.
	15.0	147.	152.	154.	169.	234.	221.	236.	177.	154.	122.
	10.0	78.	79.	87.	87.	82.	101.	103.	110.	107.	89.
	5.0	44.	44.	44.	44.	49.	59.	52.	52.	51.	52.
	0.0	37.	37.	37.	37.	37.	37.	37.	37.	37.	37.

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		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.	1.	1.	0.	1.	1.	1.
	105.0		3.	3.	2.	2.	2.	3.	2.	5.	4.	4.
	95.0		3.	5.	4.	4.	3.	5.	3.	5.	5.	5.
	92.5		3.	5.	5.	5.	5.	5.	3.	5.	4.	4.
	90.0		3.	5.	5.	5.	6.	6.	5.	3.	4.	4.
	87.5		8.	9.	10.	10.	11.	12.	8.	6.	7.	15.
	85.0		42.	32.	30.	25.	35.	41.	28.	19.	19.	33.
V	82.5		210.	246.	187.	146.	151.	132.	127.	131.	145.	191.
E	80.0		536.	559.	429.	393.	450.	473.	429.	363.	362.	466.
R	77.5		733.	724.	591.	567.	719.	852.	609.	535.	520.	689.
T	75.0		717.	738.	727.	768.	957.	1017.	751.	743.	651.	934.
I	72.5		843.	897.	882.	949.	1186.	1066.	920.	916.	765.	1063.
C	70.0		1013.	1056.	1046.	1045.	1264.	1332.	990.	999.	915.	1006.
A	67.5		1197.	1184.	1116.	1101.	1364.	1625.	967.	1057.	1075.	1167.
L	67.0<<		1249.	1212.	1145.	1117.	1369.	1646.	963.	1069.	1106.	1200.
	65.0		1323.	1263.	1135.	1137.	1356.	1619.	952.	1094.	1107.	1171.
A	62.5		1255.	1242.	1123.	1146.	1331.	1518.	962.	1103.	1102.	1118.
N	60.0		1154.	1177.	1112.	1152.	1315.	1387.	941.	1085.	1087.	1044.
G	57.5		1101.	1117.	1074.	1150.	1268.	1260.	902.	1072.	1060.	973.
L	55.0		1053.	1056.	1045.	1114.	1171.	1199.	844.	1041.	1039.	898.
E	52.5		1022.	1021.	1005.	1049.	1083.	1107.	789.	999.	1008.	843.
	50.0		975.	972.	943.	965.	1007.	936.	756.	921.	951.	782.
	47.5		894.	898.	862.	877.	942.	741.	764.	829.	867.	696.
	45.0		806.	803.	773.	762.	848.	588.	739.	758.	780.	597.
	42.5		718.	710.	690.	675.	744.	488.	673.	716.	714.	511.
	40.0		661.	661.	650.	601.	653.	421.	635.	661.	678.	450.
	37.5		650.	658.	599.	491.	594.	397.	587.	592.	610.	439.
	35.0		606.	614.	523.	428.	479.	391.	546.	560.	560.	409.
	30.0		554.	549.	443.	340.	190.	392.	547.	540.	525.	366.
	25.0		422.	394.	345.	234.	130.	283.	415.	446.	454.	294.
	20.0		160.	173.	270.	171.	214.	222.	214.	324.	355.	203.
	15.0		127.	142.	148.	169.	207.	188.	169.	179.	154.	156.
	10.0		85.	85.	96.	98.	87.	100.	87.	88.	82.	78.
	5.0		50.	49.	50.	51.	58.	54.	48.	41.	40.	44.
	0.0		37.	37.	37.	37.	37.	37.	37.	37.	37.	37.



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5-DEGREE
ZONAL LUMEN SUMMARY

0- 5	1
5- 10	5
10- 15	16
15- 20	35
20- 25	65
25- 30	103
30- 35	141
35- 40	182
40- 45	240
45- 50	321
50- 55	404
55- 60	474
60- 65	539
65- 70	562
70- 75	479
75- 80	330
80- 85	105
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	6
0- 20	57
0- 30	225
0- 40	548
0- 50	1109
0- 60	1988
0- 70	3088
0- 80	3898
0- 90	4010
0-100	4015
0-110	4018
0-120	4019
0-130	4019
0-140	4019
0-150	4019
0-160	4019
0-170	4019
0-180	4019



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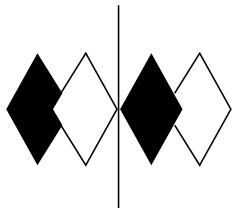
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ADDRESS: 170 LUDLOW AVE
NORTHVALE, NJ 07647

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REPORT NUMBER: ITL80198
DATE: 12/24/13
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CATALOG NUMBER: ALED5T52N (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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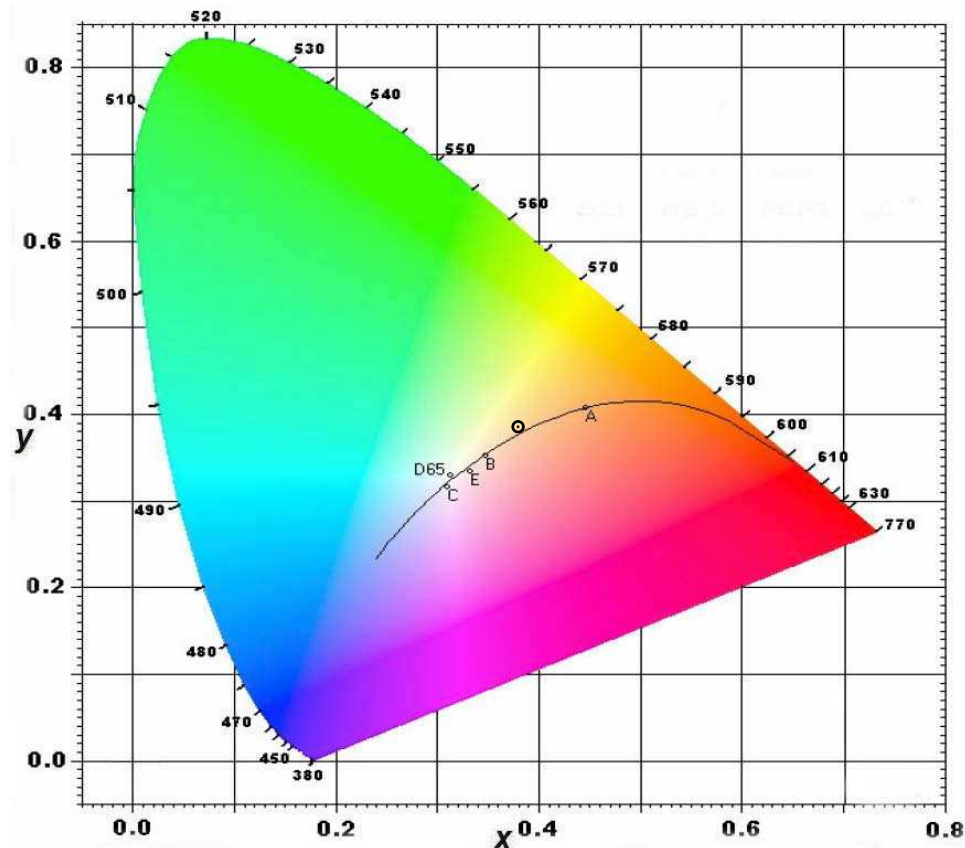
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CIE Chromaticity Diagram



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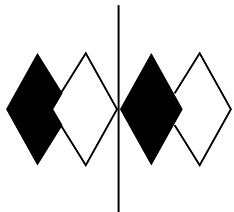
RESULTS:

SPECTRORADIOMETRIC	
Observer	CIE 1931 2 degree
Chromaticity Ordinate x	0.3793
Chromaticity Ordinate y	0.3852
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2210
Chromaticity Ordinate v'	0.5051
Correlated Color Temp CCT (K)	4091
ANSI C78.377-2008 Duv	0.004
Total Radiant Flux (milliWatts)	11957 *
ELECTRICAL	
Input Voltage (Volts AC)	120.0
Input Current (Amps AC)	0.494
Input Power (Watts)	58.9
Input Power Factor (%)	99.4
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)	0.235
Input Power (Watts)	58.7
Input Power Factor (%)	90.2
Input Current THD (%)	10.6
Input Voltage THD (%)	0.1

COLOR RENDERING INDICES	CRI
Ra (Average 1-8)	81
R1 Light greyish red	80
R2 Dark greyish yellow	85
R3 Strong yellowish green	90
R4 Moderate yellowish green	84
R5 Light bluish green	80
R6 Light blue	81
R7 Light violet	87
R8 Light reddish purple	65
R9 Strong red	4
R10 Strong yellow	65
R11 Strong green	84
R12 Strong blue	60
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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NVLAP
NVLAP LAB CODE: 200925-0

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REPORT NUMBER: ITL80198
DATE: 12/24/13
PREPARED FOR: RAB LIGHTING, INC.
CATALOG NUMBER: ALED5T52N (TYPE V)

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RESULTS:

Wavelength	mW per nm	Wavelength	mW per nm	Wavelength	mW per nm
380	0.278	515	48.784	650	33.960
385	0.277	520	52.012	655	30.142
390	0.313	525	54.125	660	26.575
395	0.380	530	55.388	665	23.294
400	0.519	535	55.889	670	20.298
405	0.804	540	56.176	675	17.603
410	1.383	545	56.366	680	15.239
415	2.601	550	56.666	685	13.133
420	5.141	555	57.214	690	11.286
425	10.110	560	58.178	695	9.684
430	18.576	565	59.582	700	8.285
435	31.845	570	61.105	705	7.079
440	52.387	575	62.913	710	6.051
445	71.902	580	64.673	715	5.157
450	67.403	585	66.223	720	4.405
455	46.128	590	67.220	725	3.750
460	31.629	595	67.671	730	3.196
465	22.906	600	67.353	735	2.722
470	16.623	605	66.283	740	2.318
475	13.779	610	64.448	745	1.984
480	13.799	615	61.749	750	1.702
485	15.885	620	58.520	755	1.457
490	19.965	625	54.777	760	1.247
495	25.740	630	50.706	765	1.069
500	32.344	635	46.499	770	0.915
505	38.702	640	42.268	775	0.790
510	44.353	645	38.043	780	0.683

