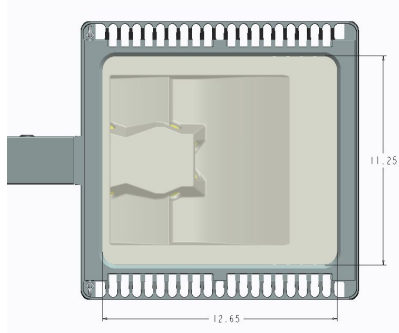


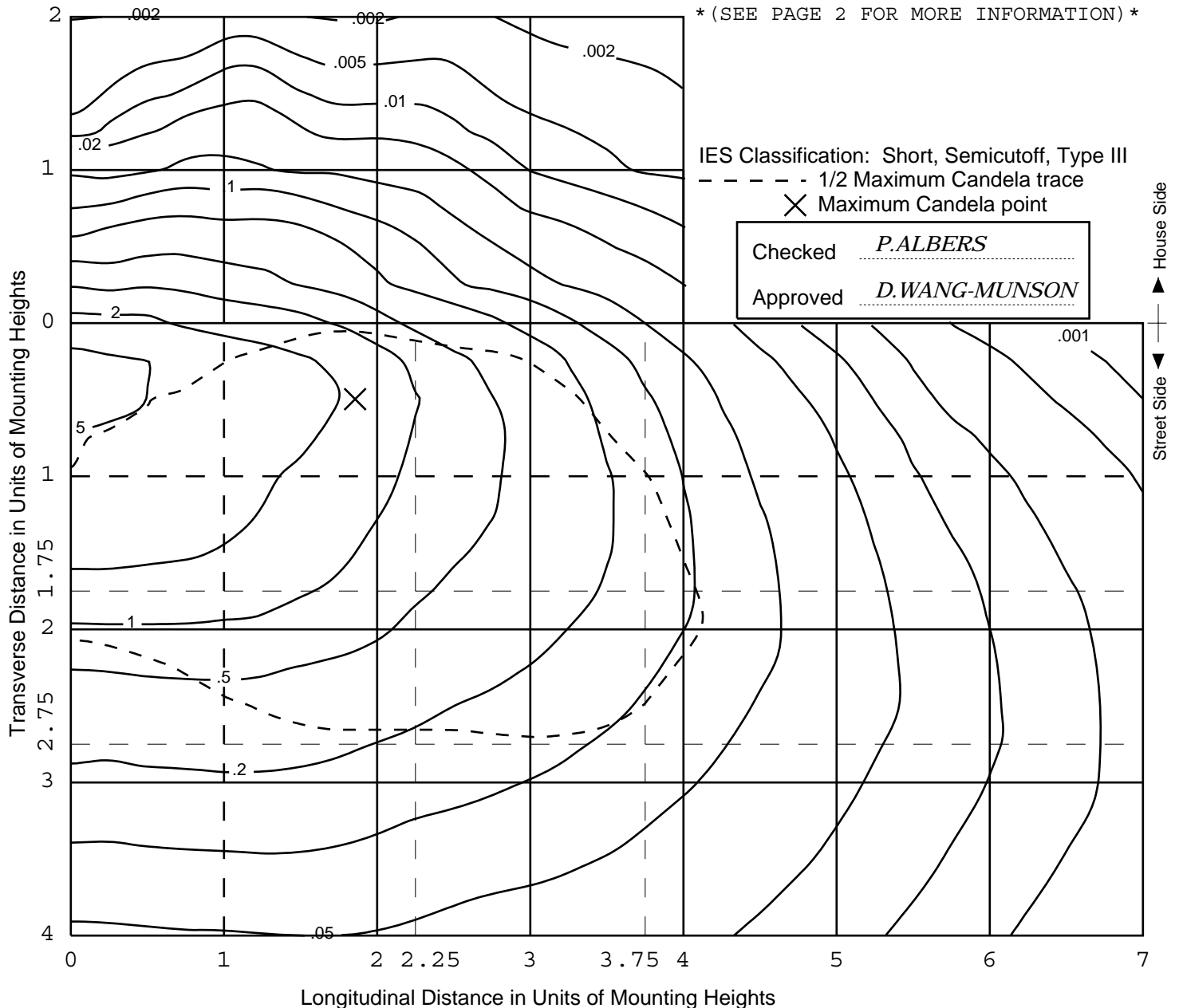
ISOFOOTCANDLE LINES OF HORIZONTAL ILLUMINATION

Values based on 25 foot mounting height.



REPORT NUMBER: RAB04246
 ISSUE DATE: 04/06/18 PAGE: 1 OF 9
 DATE SAMPLE TESTED: 04/06/18
 PREPARED FOR: RAB LIGHTING INC. RC LIGHTING
 CATALOG NUMBER: ALED3T150Y -
 RWLED3T150Y - RWLED3T150SFY -
 WPLED3T150Y (TYPE III) (ALSO APPLIES TO RCL)
 LUMINAIRE: CAST FINNED METAL HOUSING, 6
 CIRCUIT BOARDS EACH WITH 1 LED,
 MOLDED PLASTIC REFLECTOR WITH
 SPECULAR FINISH AND 1 APERTURE PER
 LED, CLEAR FLAT GLASS LENS IN CAST
 WHITE PAINTED METAL LENS FRAME.

(SEE PAGE 2 FOR MORE INFORMATION)



REPORT NUMBER: RAB04246

PAGE: 2 OF 9

ISSUE DATE: 04/06/18

DATE SAMPLE TESTED: 04/06/18

PREPARED FOR: RAB LIGHTING INC. RC LIGHTING

ADDITIONAL INFORMATION

LAMPS: SIX WHITE MULTI-CHIP LIGHT EMITTING DIODES (LEDs), 2 LEDs TILTED 63-DEGREES FROM VERTICAL BASE-UP POSITION AND CANTED 75-DEGREES FROM STRAIGHT AHEAD, 2 LEDs TILTED 67-DEGREES FROM VERTICAL BASE-UP POSITION AND CANTED 68-DEGREES FROM STRAIGHT AHEAD, 2 LEDs TILTED 58-DEGREES FROM VERTICAL BASE-UP POSITION AND CANTED 40-DEGREES FROM STRAIGHT AHEAD.

NOTE: THIS REPORT WITH THE USE OF THE NVLAP LOGO SHALL NOT BE USED BY THE CLIENT TO CLAIM PRODUCT CERTIFICATION, APPROVAL, OR ENDORSEMENT BY NVLAP, NIST, OR ANY AGENCY OF THE FEDERAL GOVERNMENT.

NOTE: DATA SHOWN IS ABSOLUTE FOR THE SAMPLE PROVIDED.

TOTAL INPUT WATTS = 162.96 W AT 120.0 VAC.

LED DRIVER: RDD-160

TEST PROCEDURE: IESNA LM-79-08

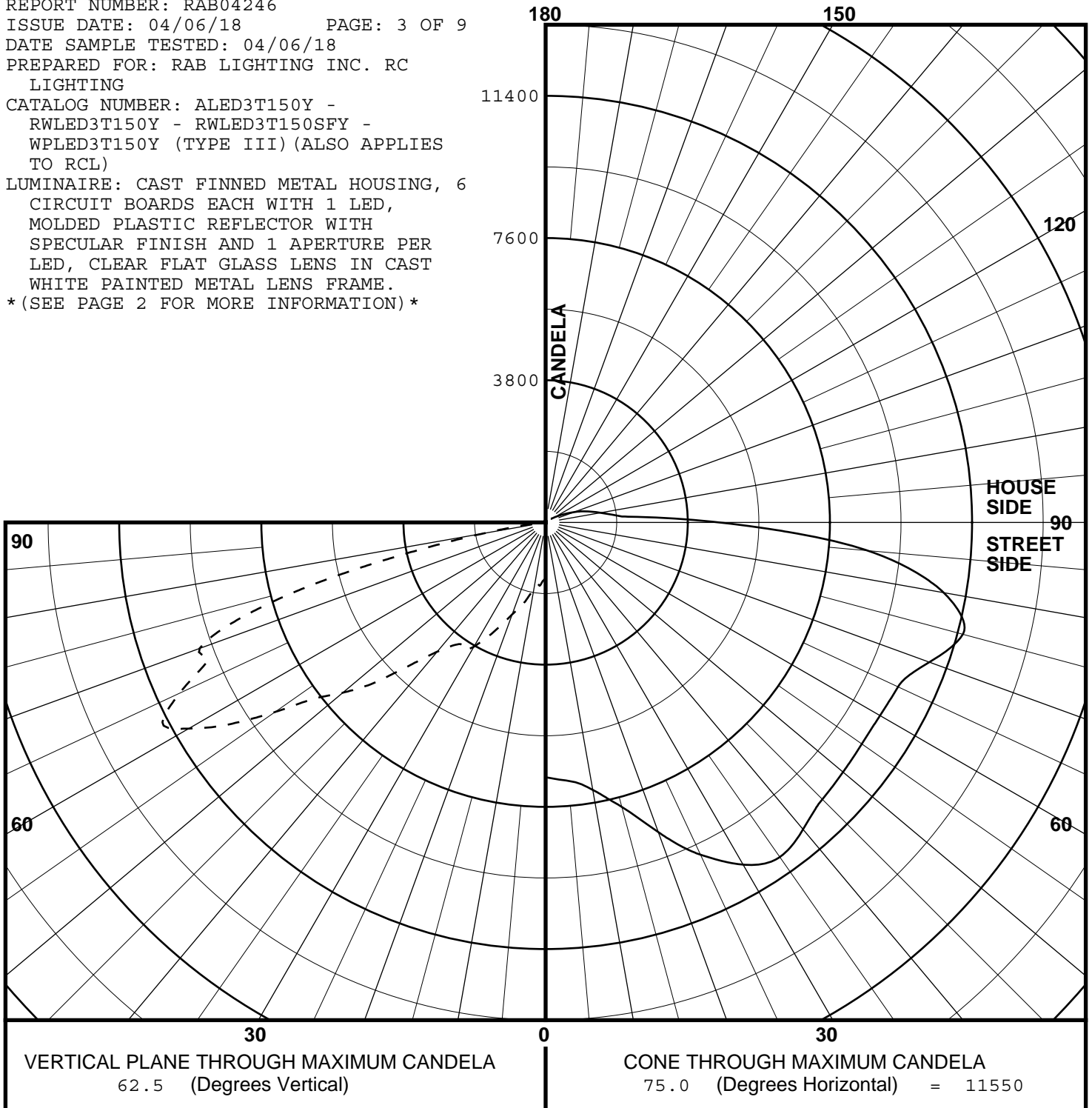
LM-80 DATA AVAILABLE FROM MANUFACTURER FOR SOLID STATE SOURCE

AMBIENT: 24.5

ACCREDITED LABORATORY CODE 201058-0

MAXIMUM PLANE AND MAXIMUM CONE PLOTS OF CANDELA

REPORT NUMBER: RAB04246
 ISSUE DATE: 04/06/18 PAGE: 3 OF 9
 DATE SAMPLE TESTED: 04/06/18
 PREPARED FOR: RAB LIGHTING INC. RC
 LIGHTING
 CATALOG NUMBER: ALED3T150Y -
 RWLED3T150Y - RWLED3T150SFY -
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 LUMINAIRE: CAST FINNED METAL HOUSING, 6
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 (SEE PAGE 2 FOR MORE INFORMATION)



REPORT NUMBER: RAB04246

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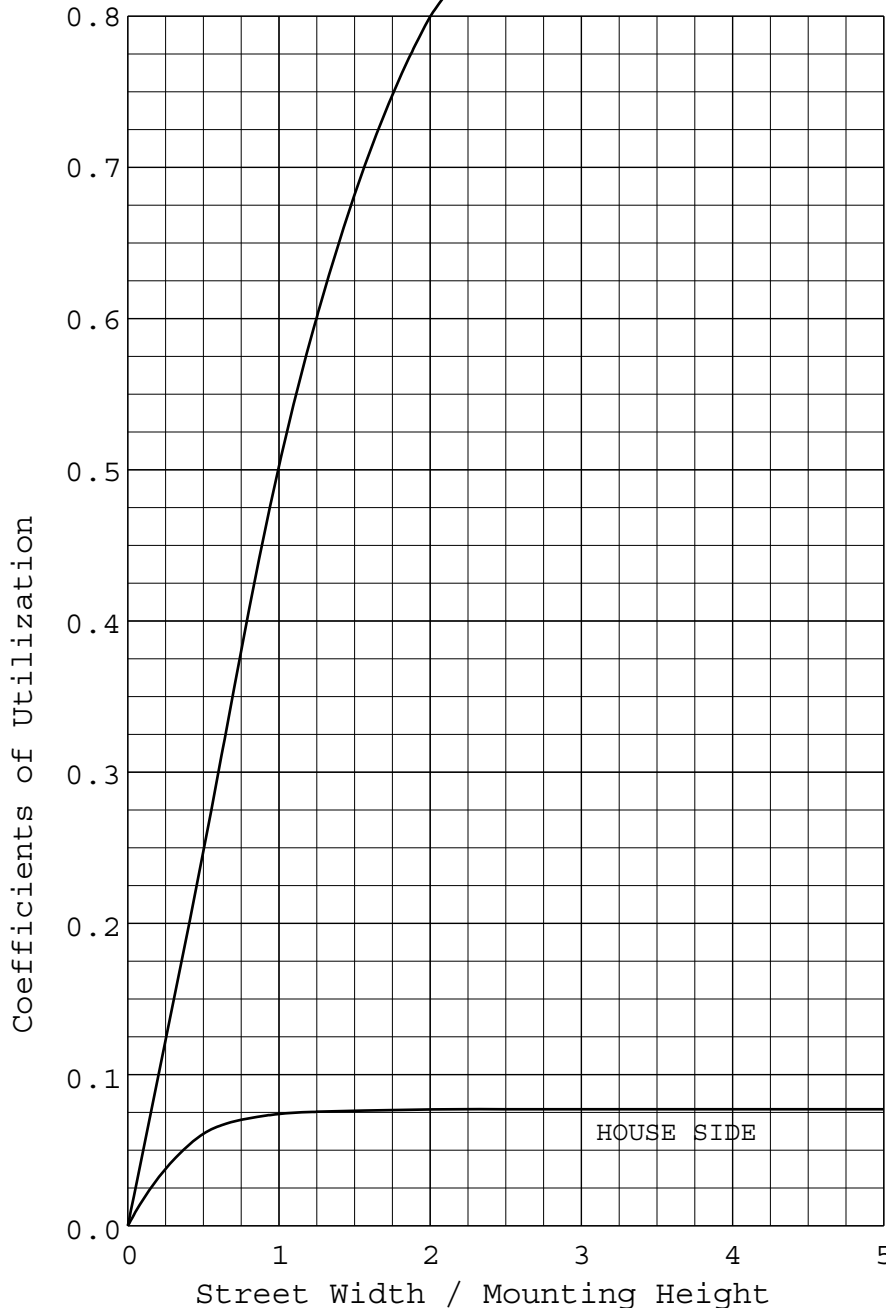
PREPARED FOR: RAB LIGHTING INC. RC LIGHTING

STREET SIDE

PAGE: 4 OF 9

DATE SAMPLE TESTED: 04/06/18

COEFFICIENTS OF UTILIZATION AND FLUX DISTRIBUTION



	LUMENS	PERCENT OF FIXTURE
DOWNWARD STREET SIDE	16399.	92.3
DOWNWARD HOUSE SIDE	1377.	7.7
DOWNWARD TOTAL	17775.	100.0
UPWARD STREET SIDE	0.	0.0
UPWARD HOUSE SIDE	0.	0.0
UPWARD TOTAL	0.	0.0
TOTAL FLUX	17775.	100.0
TOTAL INPUT WATTS = 163		
EFFICACY = 109.0 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.

REPORT NUMBER: RAB04246

ISSUE DATE: 04/06/18

PREPARED FOR: RAB LIGHTING INC. RC LIGHTING

PAGE: 5 OF 9

DATE SAMPLE TESTED: 04/06/18

BUG Rating:

Zonal Summary

Lumens

% of Fixture

B1 U0 G3

Zone Ratings

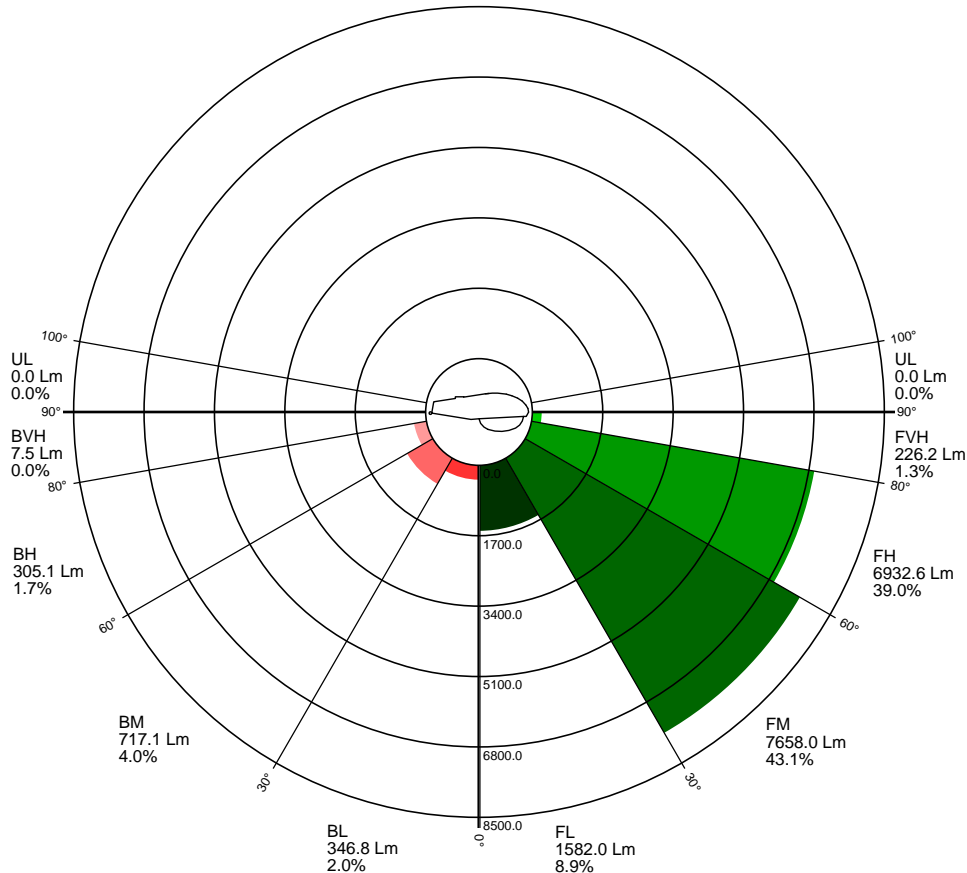
B U G

Forward		16399	92.3			
FL	(0° - 30°)	1582.0	8.9			
FM	(30° - 60°)	7658.0	43.1			
FH	(60° - 80°)	6932.6	39.0			G3
FVH	(80° - 90°)	226.2	1.3			G3
Backward		1377	7.7			
BL	(0° - 30°)	346.8	2.0	B1		
BM	(30° - 60°)	717.1	4.0	B1		
BH	(60° - 80°)	305.1	1.7	B1		G1
BVH	(80° - 90°)	7.5	0.0			G0
Upward		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		17775	100.0			

Zonal Lumen Summary

(Linear scale)

UH
0.0 Lm
0.0%



REPORT NUMBER: RAB04246

ISSUE DATE: 04/06/18

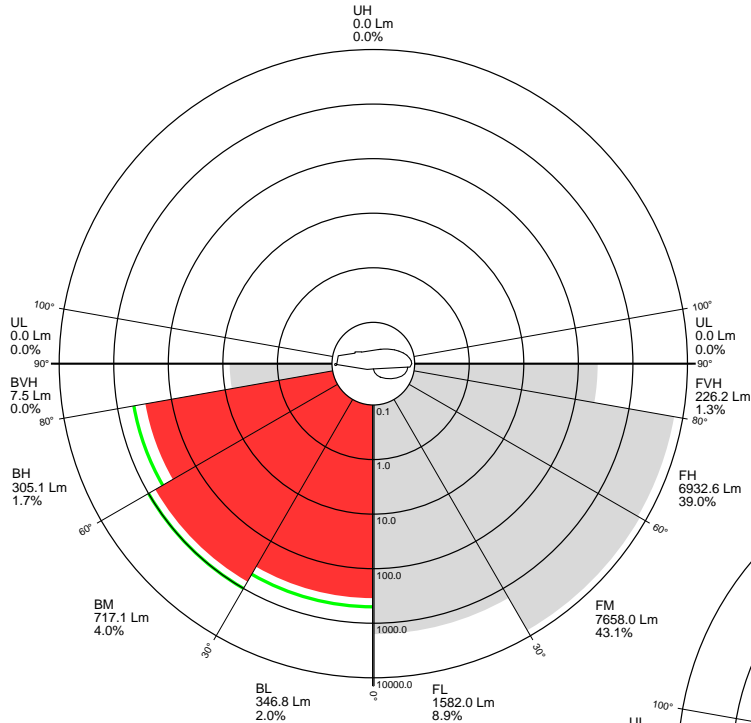
PREPARED FOR: RAB LIGHTING INC. RC LIGHTING

PAGE: 6 OF 9

DATE SAMPLE TESTED: 04/06/18

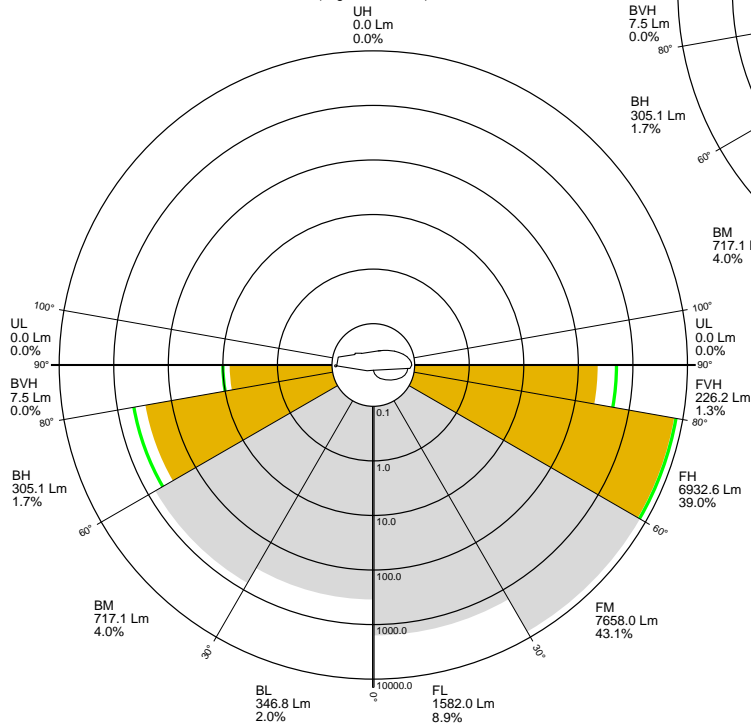
Backlight Rating Details

(Logarithmic scale)



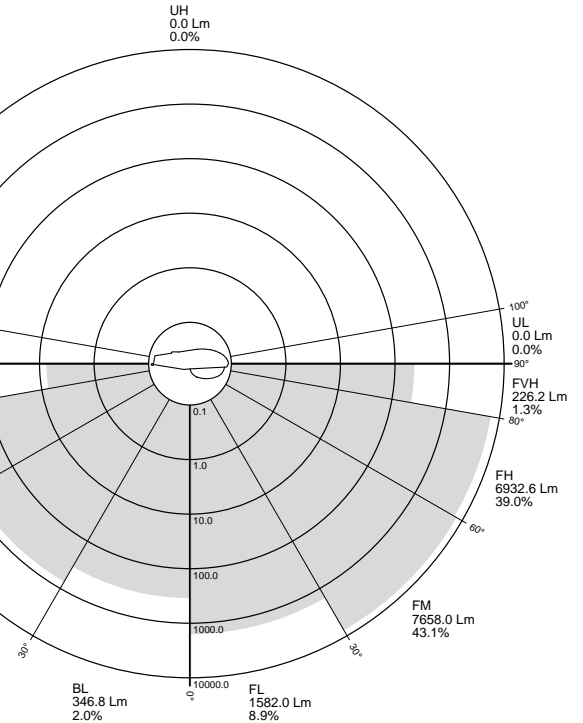
Glare Rating Details

(Logarithmic scale)



Uplight Rating Details

(Logarithmic scale)



REPORT NUMBER: RAB04246

PAGE: 8 OF 9

ISSUE DATE: 04/06/18

DATE SAMPLE TESTED: 04/06/18

PREPARED FOR: RAB LIGHTING INC. RC LIGHTING

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	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	105.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	95.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	90.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	87.5	14.	14.	14.	14.	13.	12.	10.	7.	6.	7.	7.
	85.0	18.	17.	16.	14.	12.	11.	9.	7.	6.	6.	6.
V	82.5	53.	39.	23.	15.	12.	10.	8.	6.	5.	6.	6.
E	80.0	255.	195.	56.	35.	13.	9.	8.	6.	5.	6.	6.
R	77.5	862.	510.	117.	80.	14.	9.	8.	6.	6.	7.	7.
T	75.0	1854.	754.	197.	96.	29.	10.	8.	7.	8.	9.	9.
I	72.5	2824.	1033.	271.	117.	88.	17.	8.	7.	9.	10.	10.
C	70.0	3538.	1318.	524.	216.	103.	30.	11.	7.	9.	9.	9.
A	67.5	3590.	1414.	886.	321.	104.	45.	25.	10.	11.	12.	12.
L	65.0	4019.	1620.	965.	390.	124.	78.	57.	20.	13.	14.	14.
	62.5<<	4658.	1961.	1143.	502.	166.	134.	88.	31.	18.	14.	13.
A	60.0	4854.	2095.	1394.	593.	213.	176.	92.	39.	24.	18.	16.
N	57.5	4597.	2190.	1440.	775.	250.	186.	104.	48.	25.	16.	15.
G	55.0	4094.	2089.	1404.	858.	288.	196.	119.	57.	27.	13.	12.
L	52.5	3590.	2189.	1314.	789.	343.	215.	130.	70.	36.	14.	11.
E	50.0	3204.	2305.	1230.	758.	412.	252.	139.	76.	45.	30.	21.
	47.5	2874.	2187.	1208.	799.	502.	273.	162.	87.	52.	63.	52.
	45.0	2586.	2071.	1240.	811.	539.	305.	183.	98.	72.	61.	74.
	42.5	2396.	1930.	1229.	801.	582.	341.	210.	121.	79.	48.	42.
	40.0	2242.	1839.	1208.	796.	631.	379.	230.	168.	111.	70.	61.
	37.5	2180.	1821.	1233.	784.	657.	408.	256.	160.	137.	118.	123.
	35.0	2219.	1878.	1303.	799.	659.	425.	304.	189.	148.	124.	119.
	30.0	2104.	1853.	1395.	875.	647.	554.	361.	254.	211.	166.	151.
	25.0	1930.	1697.	1388.	1011.	678.	496.	381.	286.	235.	231.	233.
	20.0	1722.	1547.	1267.	1092.	779.	559.	415.	334.	294.	288.	284.
	15.0	1626.	1526.	1301.	1138.	975.	753.	616.	564.	576.	587.	602.
	10.0	1493.	1425.	1297.	1171.	1095.	1053.	992.	931.	851.	798.	804.
	5.0	1535.	1494.	1414.	1338.	1264.	1212.	1166.	1112.	1071.	1048.	1060.
	0.0	1488.	1488.	1488.	1488.	1488.	1488.	1488.	1488.	1488.	1488.	1488.

CONE OF MAXIMUM CANDELA

REPORT NUMBER: RAB04246

ISSUE DATE: 04/06/18

PREPARED FOR: RAB LIGHTING INC. RC LIGHTING

PAGE: 9 OF 9

DATE SAMPLE TESTED: 04/06/18

5-DEGREE ZONAL LUMEN SUMMARY

0- 5	37
5- 10	125
10- 15	237
15- 20	363
20- 25	502
25- 30	665
30- 35	837
35- 40	983
40- 45	1160
45- 50	1414
50- 55	1768
55- 60	2214
60- 65	2424
65- 70	2176
70- 75	1701
75- 80	937
80- 85	220
85- 90	13
90- 95	0
95-100	0
100-105	0
105-110	0
110-115	0
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	163
0- 20	762
0- 30	1929
0- 40	3749
0- 50	6323
0- 60	10304
0- 70	14903
0- 80	17542
0- 90	17775
0-100	17775
0-110	17775
0-120	17775
0-130	17775
0-140	17775
0-150	17775
0-160	17775
0-170	17775
0-180	17775

REPORT NUMBER: RAB04247
DATE: 4/10/2018
PREPARED FOR: RAB LIGHTING INC. RC LIGHTING
CATALOG NUMBER: ALED3T150Y - RWLED3T150Y - RWLED3T150SFY - WPLED3T150Y (TYPE III) (ALSO APPLIES TO RCL)

Page 1 of 4

ADDRESS: 170 LUDLOW AVE, NORTHVALE, NJ 07647

LUMINAIRE: CAST FINNED METAL HOUSING, 6 CIRCUIT BOARDS EACH WITH 1 LED, MOLDED PLASTIC REFLECTOR WITH SPECULAR FINISH AND 1 APERTURE PER LED, CLEAR FLAT GLASS LENS IN CAST WHITE PAINTED METAL LENS FRAME.

LAMP: SIX WHITE MULTI-CHIP LIGHT EMITTING DIODES (LEDs), 2 LEDs TILTED 63-DEGREES FROM VERTICAL BASE-UP POSITION AND CANTED 75-DEGREES FROM STRAIGHT AHEAD, 2 LEDs TILTED 67-DEGREES FROM VERTICAL BASE-UP POSITION AND CANTED 68-DEGREES FROM STRAIGHT AHEAD, 2 LEDs TILTED 58-DEGREES FROM VERTICAL BASE-UP POSITION AND CANTED 40-DEGREES FROM STRAIGHT AHEAD.

DRIVER: RDD-160

OBJECT OF TEST: DATA SHOWN IS ABSOLUTE FOR THE SAMPLE PROVIDED AT THE RATED INPUT VOLTAGES (120.0 AND 277.0 VAC, 60Hz) TO THE TEST SAMPLE.

INSTRUMENTS:	GWINSTEK PROGRAMMABLE AC POWER SOURCE APS-7100	Calibration Due:
	CHROMA PROGRAMMABLE DIGITAL POWER METER MODEL 66202	N/A
	OCEAN OPTICS QE65PRO Spectroradiometer	3/08/19
	RAB 2.0 meter Diameter Integrating Sphere, 4PI Geometry	02/22/19

OBJECT OF TEST: Measure the Absolute Flux in lumens*, Total Radiant Flux*, Spectral Power Distribution (SPD), Correlated Color Temperature (CCT), Color Rendering Indices (CRIa,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. Measure electrical data including Total Harmonic Distortion (THD) at maximum nominal rated input voltage. Report Off-State Power.

PROCEDURE: The test sample was mounted inside the integrating sphere, energized, 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 60 HZ input in a 25 +/-1 degree Celsius free air ambient and in accordance with IESNA LM-79-08. Electrical data was also recorded at maximum nominal rated input voltage (277.0 VAC). 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)

Checked	<u>X.CAO</u>
Approved	<u>D.WANG-MUNSON</u> Lighting Engineer

REPORT NUMBER: RAB04247
 DATE: 4/10/2018
 PREPARED FOR: RAB LIGHTING INC. RC LIGHTING
 CATALOG NUMBER: ALED3T150Y - RWLED3T150Y - RWLED3T150SFY - WPLED3T150Y (TYPE III) (ALSO APPLIES TO RCL)

Page 2 of 4

RESULTS:

PHOTOMETRIC	
Total Integrated Flux (lumens)	17775 *
SPECTRORADIOMETRIC	
Observer	CIE 1931 2 degree
Chromaticity Ordinate x	0.4353
Chromaticity Ordinate y	0.4062
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2486
Chromaticity Ordinate v'	0.5220
Correlated Color Temp CCT (K)	3044
ANSI C78.377-2008 Duv	0.001
Total Radiant Flux (milliWatts)	49640 *
ELECTRICAL	
Input Voltage (Volts AC)	120.0
Input Current (Amps AC)	1.37
Input Power (Watts)	163.0
Input Power Factor (%)	99.4
Input Current THD (%)	7.6
Input Voltage THD (%)	0.1
EFFICACY (Lumens/Watt)	
	109.0
ELECTRICAL AT MAX NONIMAL INPUT	
Input Voltage (Volts AC)	277.0
Input Current (Amps AC)	0.604
Input Power (Watts)	159.6
Input Power Factor (%)	95.4
Input Current THD (%)	14.6
Input Voltage THD (%)	0.2
Off-State Power (Watts)	
	0.0

COLOR RENDERING INDICES	CRI
Ra (Average 1-8)	71
R1 Light greyish red	66
R2 Dark greyish yellow	81
R3 Strong yellowish green	95
R4 Moderate yellowish green	68
R5 Light bluish green	67
R6 Light blue	77
R7 Light violet	75
R8 Light reddish purple	38
R9 Strong red	-46
R10 Strong yellow	60
R11 Strong green	64
R12 Strong blue	58
R13 Light yellowish pink (skin)	68
R14 Moderate olive green (leaf)	97

*NOTE:

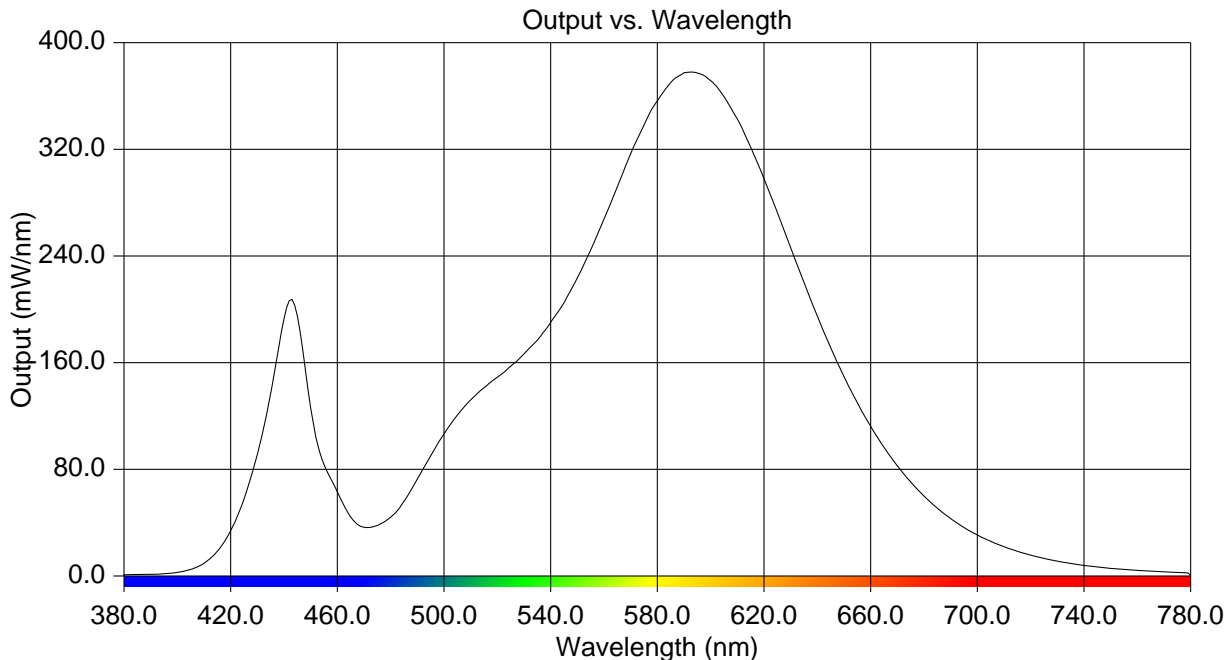
Proper calibration of integrating spheres for measuring total flux output of non-directional samples will produce reliable, repeatable results within the calibration tolerances of the equipment used. However, measurement of test samples with significant self absorption and/or directional output, even 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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 DATE: 4/10/2018
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 CATALOG NUMBER: ALED3T150Y - RWLED3T150Y - RWLED3T150SFY - WPLED3T150Y (TYPE III) (ALSO APPLIES TO RCL)

Page 3 of 4

RESULTS:

Wavelength	mW per nm	Wavelength	mW per nm	Wavelength	mW per nm
380	0.872	515	141.191	650	149.767
385	1.074	520	149.147	655	130.105
390	1.255	525	157.345	660	112.179
395	1.683	530	166.591	665	96.400
400	2.695	535	176.766	670	82.486
405	4.869	540	190.350	675	70.240
410	9.551	545	205.139	680	59.810
415	18.498	550	223.387	685	50.760
420	34.050	555	244.648	690	43.001
425	57.694	560	267.167	695	36.330
430	91.541	565	292.153	700	30.775
435	136.644	570	316.648	705	25.933
440	192.844	575	338.257	710	21.915
445	195.063	580	356.267	715	18.530
450	126.022	585	369.983	720	15.587
455	83.612	590	377.436	725	13.184
460	63.099	595	377.192	730	11.161
465	44.263	600	371.411	735	9.409
470	36.511	605	359.399	740	7.929
475	37.954	610	342.759	745	6.765
480	43.909	615	321.317	750	5.756
485	56.016	620	298.334	755	4.911
490	72.682	625	272.488	760	4.181
495	90.375	630	245.904	765	3.599
500	106.536	635	219.878	770	3.103
505	120.648	640	194.764	775	2.638
510	132.108	645	171.591	780	0.392



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Page 4 of 4

CIE Chromaticity Diagram

