

itl boulder
THE LIGHT CENTER OF THE INDUSTRY SINCE 1955

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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: ITL79965

ISSUE DATE: 11/26/13

PAGE: 1 OF 7

PREPARED FOR: RAB LIGHTING, INC.

CATALOG NUMBER: GLED78 OR GPLED78 (w/ PRISMATIC 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 PLASTIC DROP LENS WITH RADIALLY PRISMATIC BOTTOM AND PRISMATIC SIDES IN CAST BROWN PAINTED METAL FRAME. LENS RADIAL PRISMS IN, AND SIDE PRISMS IN AND OUT.

LAMPS: SIX WHITE MULTI-CHIP LIGHT EMITTING DIODES (LEDs), AIMED AT THE HORIZON.

TOTAL INPUT WATTS = 88.3 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.

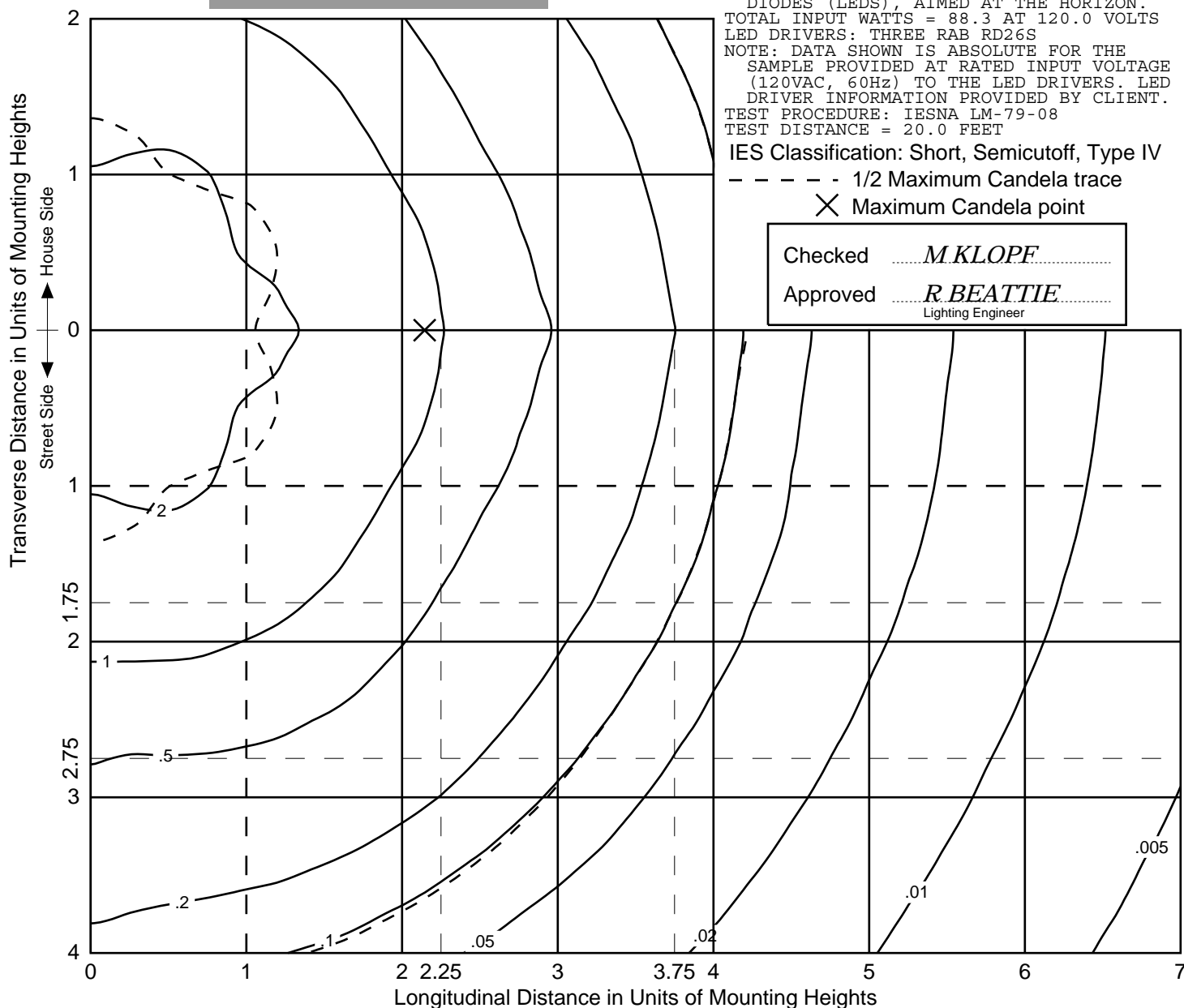
TEST PROCEDURE: IESNA LM-79-08

TEST DISTANCE = 20.0 FEET

IES Classification: Short, Semicutoff, Type IV

--- 1/2 Maximum Candela trace

X Maximum Candela point

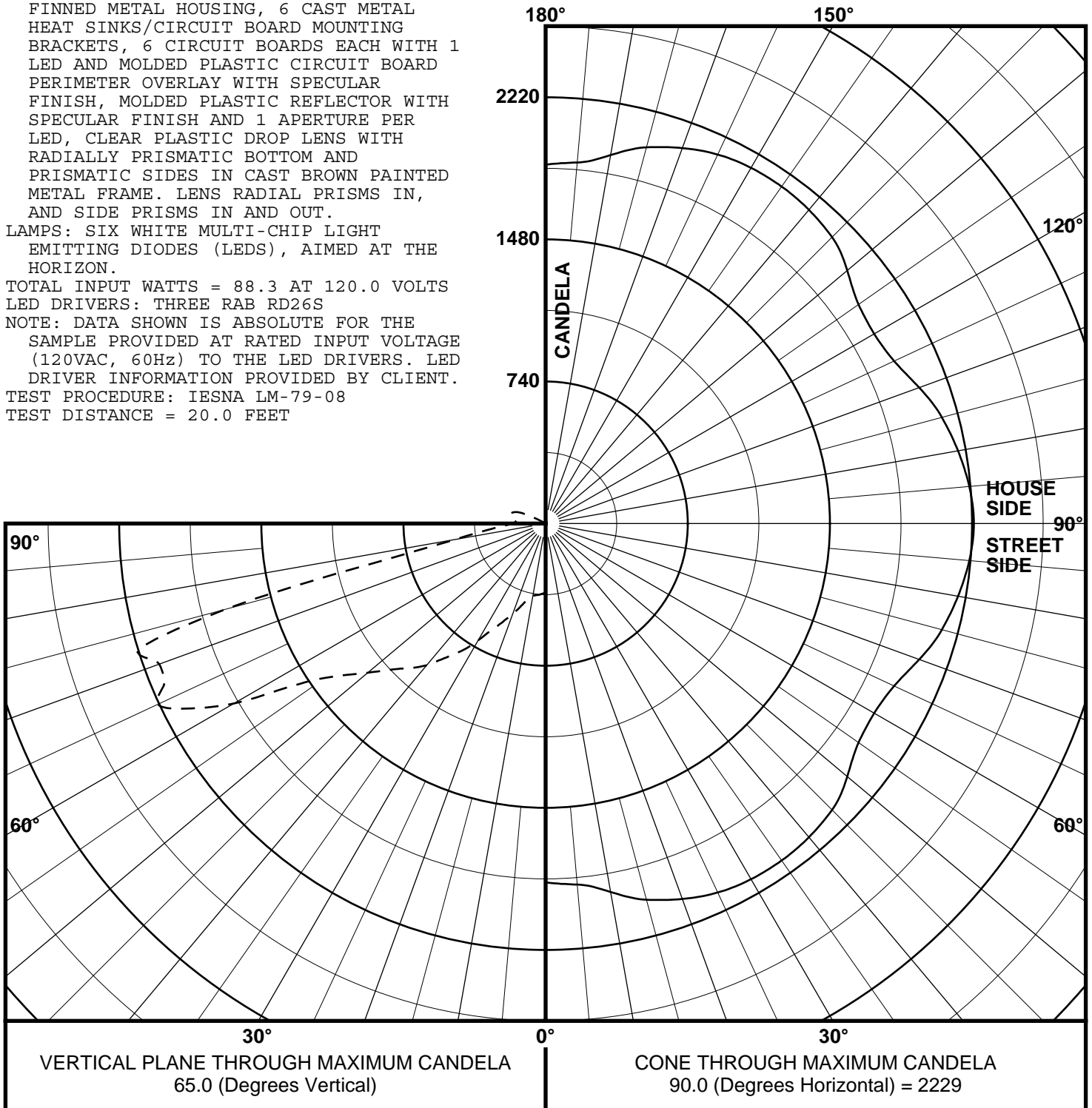


Checked *M. KLOPF*

Approved *R. BEATTIE*
Lighting Engineer

REPORT NUMBER: ITL79965
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CATALOG NUMBER: GLED78 OR GPLED78 (W/
PRISMATIC 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
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RADIALLY PRISMATIC BOTTOM AND
PRISMATIC SIDES IN CAST BROWN PAINTED
METAL FRAME. LENS RADIAL PRISMS IN,
AND SIDE PRISMS IN AND OUT.
LAMPS: SIX WHITE MULTI-CHIP LIGHT
EMITTING DIODES (LEDs), AIMED AT THE
HORIZON.
TOTAL INPUT WATTS = 88.3 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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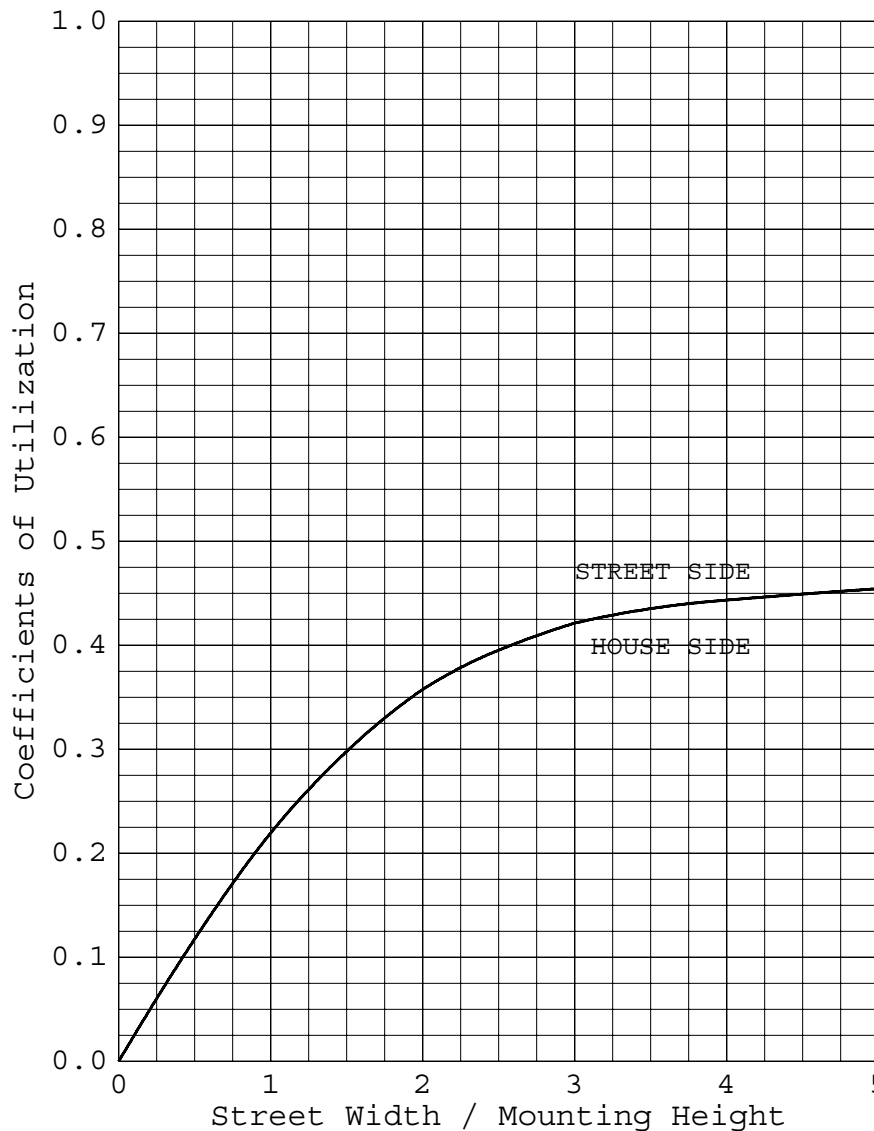
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PAGE: 3 OF 7

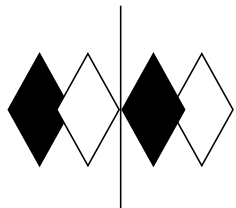
COEFFICIENTS OF UTILIZATION AND FLUX DISTRIBUTION



	LUMENS	PERCENT OF FIXTURE
DOWNWARD STREET SIDE	3310	46.9
DOWNWARD HOUSE SIDE	3310	46.9
DOWNWARD TOTAL	6620	93.9
UPWARD STREET SIDE	216	3.1
UPWARD HOUSE SIDE	216	3.1
UPWARD TOTAL	433	6.1
TOTAL FLUX	7053	100.0

EFFICACY = 79.9 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 7

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	3310.	46.9	
FL (0- 30)	220.5	3.1	
FM (30- 60)	1228.1	17.4	
FH (60- 80)	1712.8	24.3	G1
FVH(80- 90)	148.6	2.1	G2
BACK LIGHT	3310.	46.9	
BL (0- 30)	220.5	3.1	B1
BM (30- 60)	1228.1	17.4	B2
BH (60- 80)	1712.8	24.3	B3 G1
BVH(80- 90)	148.6	2.1	G2
UPLIGHT	433.	6.1	
UL (90-100)	167.4	2.4	U3
UH (100-180)	265.2	3.8	U3
TRAPPED LIGHT	0.	0.0	
TOTAL FLUX	7053.	100.0	

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

BUG RATING: B3 U3 G2

REPORT NUMBER: ITL79965

PAGE: 5 OF 7

ISSUE DATE: 11/26/13

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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	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	91.	94.	95.	101.	103.	98.	97.	95.	99.	102.	105.
	105.0	153.	154.	161.	174.	173.	165.	159.	159.	167.	179.	182.
	95.0	139.	139.	146.	155.	156.	147.	142.	143.	150.	158.	162.
	92.5	134.	134.	141.	148.	149.	141.	137.	138.	143.	150.	153.
	90.0	150.	148.	156.	161.	162.	157.	151.	153.	157.	165.	167.
	87.5	189.	186.	195.	199.	200.	195.	190.	192.	196.	205.	207.
	85.0	239.	237.	250.	255.	258.	253.	243.	244.	252.	261.	264.
	82.5	311.	316.	332.	341.	340.	333.	319.	320.	330.	341.	346.
	80.0	470.	463.	486.	493.	492.	482.	458.	450.	464.	470.	482.
	77.5	893.	851.	856.	844.	828.	840.	809.	797.	783.	766.	794.
	75.0	1850.	1673.	1681.	1713.	1708.	1584.	1532.	1554.	1572.	1615.	1725.
	72.5	1894.	1754.	1924.	2085.	2096.	1940.	1807.	1795.	1936.	2096.	2227.
	70.0	1861.	1770.	1909.	2009.	2046.	1983.	1868.	1845.	1953.	2024.	2140.
	67.5	1806.	1780.	1912.	2020.	2047.	2001.	1867.	1873.	2006.	2085.	2146.
	65.0	1869.	1887.	2028.	2120.	2142.	2109.	1989.	2002.	2136.	2214.	2229.
	62.5	1850.	1865.	1944.	2015.	2029.	2012.	1946.	1951.	2033.	2088.	2086.
	60.0	1664.	1634.	1702.	1784.	1791.	1748.	1690.	1689.	1761.	1857.	1875.
57.5	1372.	1401.	1448.	1518.	1526.	1507.	1420.	1433.	1510.	1567.	1582.	
55.0	1170.	1214.	1273.	1345.	1369.	1319.	1236.	1235.	1325.	1386.	1401.	
52.5	1035.	1063.	1135.	1239.	1248.	1181.	1077.	1079.	1184.	1261.	1293.	
50.0	920.	955.	1052.	1158.	1161.	1075.	956.	959.	1076.	1171.	1208.	
47.5	860.	895.	994.	1089.	1095.	1006.	889.	897.	1004.	1106.	1132.	
45.0	852.	862.	950.	1029.	1031.	952.	860.	867.	957.	1059.	1069.	
42.5	845.	844.	915.	984.	975.	913.	838.	848.	921.	1009.	1019.	
40.0	829.	839.	887.	933.	920.	877.	825.	840.	894.	953.	963.	
37.5	830.	833.	860.	877.	863.	839.	822.	830.	856.	890.	892.	
35.0	811.	808.	819.	817.	803.	790.	795.	798.	808.	826.	829.	
32.5	773.	768.	764.	759.	743.	740.	759.	752.	752.	769.	772.	
30.0	721.	718.	706.	699.	693.	693.	711.	708.	702.	703.	702.	
25.0	607.	607.	594.	583.	579.	591.	613.	612.	596.	583.	586.	
20.0	515.	517.	504.	493.	492.	499.	510.	515.	507.	502.	502.	
15.0	442.	440.	433.	425.	426.	429.	437.	441.	436.	429.	427.	
10.0	384.	383.	380.	377.	377.	380.	381.	383.	383.	384.	384.	
5.0	367.	367.	368.	368.	369.	370.	371.	372.	372.	372.	372.	
0.0	360.	360.	360.	360.	360.	360.	360.	360.	360.	360.	360.	
		PLANE OF MAXIMUM CANDELA										
		CONE OF MAXIMUM CANDELA										



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PAGE: 6 OF 7

5-DEGREE
ZONAL LUMEN SUMMARY

0- 5	9
5- 10	27
10- 15	48
15- 20	77
20- 25	115
25- 30	165
30- 35	223
35- 40	284
40- 45	340
45- 50	405
50- 55	510
55- 60	694
60- 65	947
65- 70	1003
70- 75	975
75- 80	501
80- 85	188
85- 90	109
90- 95	81
95-100	87
100-105	89
105-110	86
110-115	69
115-120	21
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	36
0- 20	161
0- 30	441
0- 40	948
0- 50	1693
0- 60	2897
0- 70	4847
0- 80	6323
0- 90	6620
0-100	6787
0-110	6962
0-120	7052
0-130	7053
0-140	7053
0-150	7053
0-160	7053
0-170	7053
0-180	7053



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ADDRESS: 170 LUDLOW AVE
NORTHVALE, NJ 07647

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Page 1 of 4

REPORT NUMBER: ITL79968
DATE: 11/27/13
PREPARED FOR: RAB LIGHTING, INC.
CATALOG NUMBER: GLED78 OR GPLED78 (W/ PRISMATIC 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 PLASTIC DROP LENS WITH RADIALY PRISMATIC BOTTOM AND PRISMATIC SIDES IN CAST BROWN PAINTED METAL FRAME. LENS RADIAL PRISMS IN, AND SIDE PRISMS IN AND OUT.

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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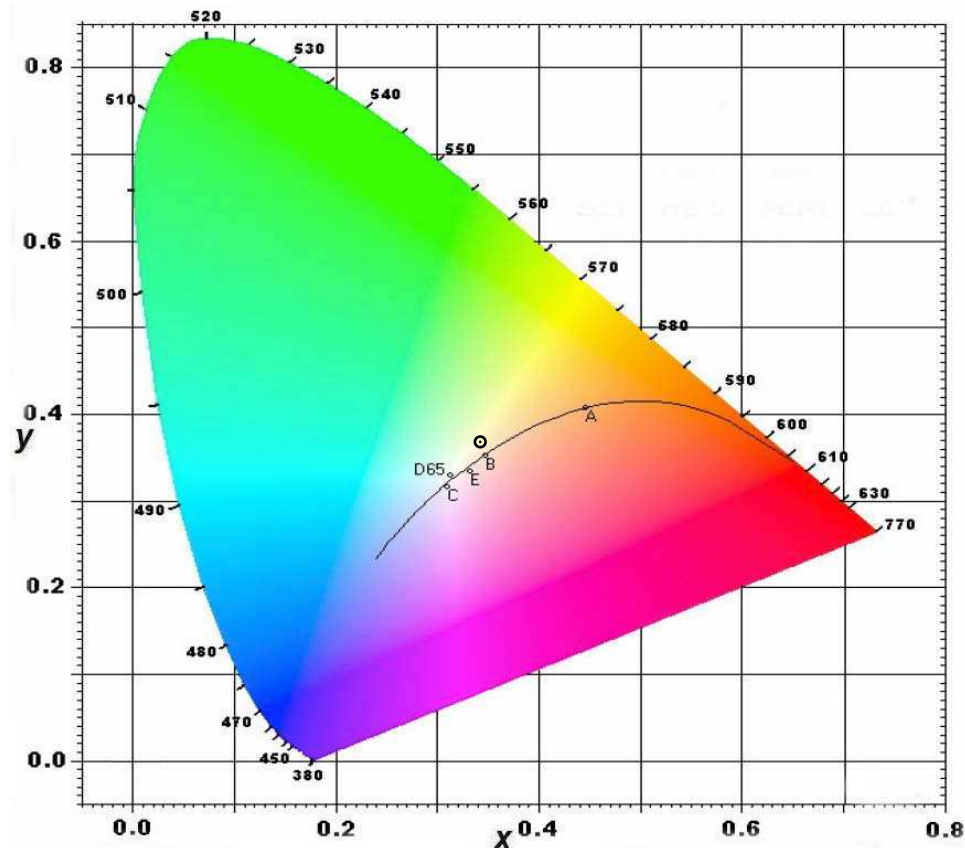
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Page 4 of 4

CIE Chromaticity Diagram





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Page 2 of 4

RESULTS:

SPECTRORADIOMETRIC	
Observer	CIE 1931 2 degree
Chromaticity Ordinate x	0.3420
Chromaticity Ordinate y	0.3678
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2033
Chromaticity Ordinate v'	0.4919
Correlated Color Temp CCT (K)	5160
ANSI C78.377-2008 Duv	0.009
Total Radiant Flux (milliWatts)	20662 *
ELECTRICAL	
Input Voltage (Volts AC)	120.0
Input Current (Amps AC)	0.741
Input Power (Watts)	88.4
Input Power Factor (%)	99.4
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)	0.350
Input Power (Watts)	88.0
Input Power Factor (%)	90.8
Input Current THD (%)	10.7
Input Voltage THD (%)	0.1

COLOR RENDERING INDICES	CRI
Ra (Average 1-8)	68
R1 Light greyish red	65
R2 Dark greyish yellow	72
R3 Strong yellowish green	78
R4 Moderate yellowish green	69
R5 Light bluish green	65
R6 Light blue	62
R7 Light violet	81
R8 Light reddish purple	55
R9 Strong red	-39
R10 Strong yellow	34
R11 Strong green	64
R12 Strong blue	33
R13 Light yellowish pink (skin)	65
R14 Moderate olive green (leaf)	87

*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	0.556	515	77.187	650	43.138
385	0.592	520	91.127	655	39.181
390	0.690	525	102.195	660	35.357
395	0.867	530	110.323	665	31.782
400	1.213	535	115.697	670	28.477
405	1.975	540	119.088	675	25.462
410	3.695	545	120.883	680	22.707
415	7.233	550	121.731	685	20.201
420	13.842	555	121.740	690	17.928
425	25.278	560	120.841	695	15.892
430	43.504	565	119.389	700	14.055
435	68.635	570	117.379	705	12.413
440	103.003	575	114.568	710	10.958
445	149.537	580	111.414	715	9.713
450	174.526	585	107.786	720	8.560
455	139.513	590	103.860	725	7.552
460	87.383	595	99.488	730	6.655
465	57.235	600	94.951	735	5.854
470	38.777	605	89.981	740	5.152
475	25.810	610	84.676	745	4.560
480	19.350	615	78.973	750	4.037
485	17.382	620	73.212	755	3.561
490	18.482	625	67.548	760	3.150
495	23.448	630	61.899	765	2.777
500	32.978	635	56.755	770	2.456
505	46.201	640	51.917	775	2.178
510	61.691	645	47.423	780	1.926

