



## Product Test Reference: CALiPER BK 09-108 Parking Structure Fluorescent

### DOE TEST REPORT BK 09-108 – SUMMARY PAGE

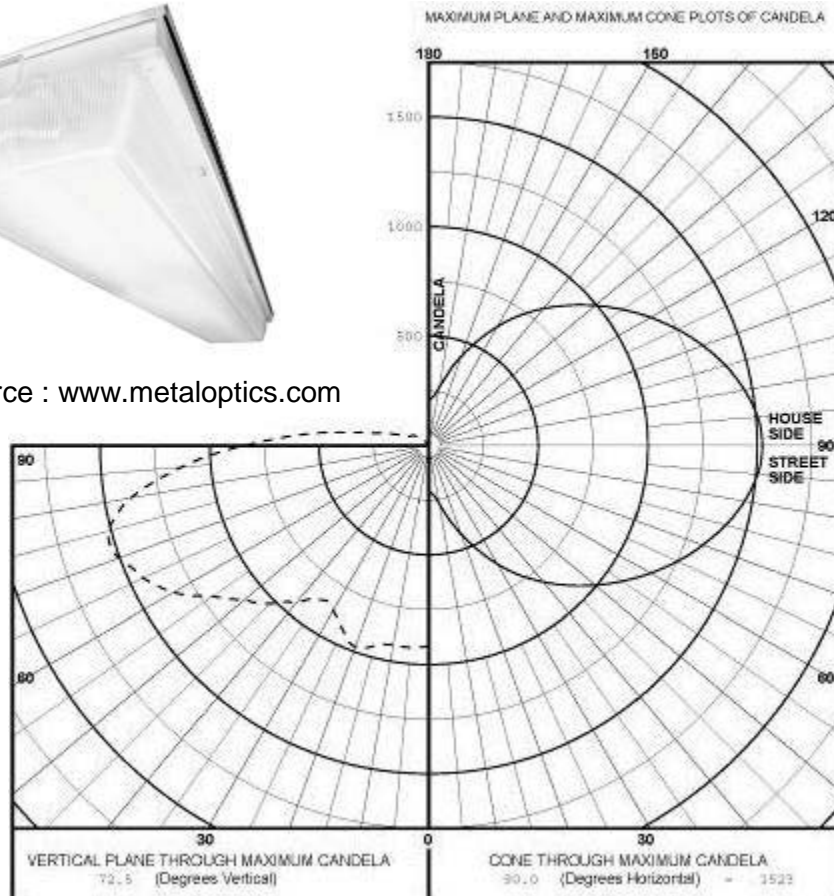
Product Category	Parking Structure
Product Description	MetalOptics MPG Parking Garage Luminaire T5HO MPG4-254T5HO-B1X20-MVOLT- GEB10PS-LP841A
Date of Test(s) BK 09-108	February 11, 2010
Laboratory Performing Testing	Independent Testing Laboratories, Inc (ITL)
List of Tests Performed	Spectroradiometry & Goniophotometry following IESNA LM-79, Temperature
Total Luminaire Light Output BK 09-108-01	5787 lm
Luminaire Efficacy BK 09-108-01	56.2 lm/W

Product Photo



Photo source : [www.metaloptics.com](http://www.metaloptics.com)

Luminaire Candela Distribution Plot  
BK 09-108-02



### Product Test References

CALiPER Test Number	BK 09-108
Manufacturer's name	MetalOptics
Product Category	Parking Structure
Product Description	MetalOptics MPG Parking Garage Luminaire T5HO
Catalog Number	MPG4-254T5HO-B1X20-MVOLT-GEB10PS-LP841A
Acquisition Notes	Ordered via distributor. Arrived October 2010. Note MetalOptics products have been merged with the Lithonia product catalog. The current product number for this is FPG4-254T5HO-B1X20-MVOLT-GEB10PS-LP841A

### Manufacturer Reported Information: T5HO Lamp/Package References

(www.philips.com spec sheet 4/2003)

Lamp	Alto Silhouette F54T5/841/HO/ALTO (Amalgam, 82 CRI per Luminaire Manufacturer)
Lamp Rated Power	54W
Lamp Rated CCT	4100K
Lamp Rated CRI	85
Lamp Initial Lumens	5000 (x2 lamps per fixture)
Lamp Efficacy	93 lm/W (calculated)
Lamp Rated Life	20,000 hours Rated Avg. Life

### Manufacturer Reported Information: Luminaire References

(www.metaloptics.com 11/2009)

Luminaire number of Lamps	2
Luminaire ballast	Advance ICN-2S54-90C
Luminaire Rated Voltage	120V – 277V, 60Hz
Luminaire Fixture Efficiency	61.8%
Luminaire Total Light Output	6180 lm
Luminaire Efficacy	57 lm /W
Luminaire Manufacturer Description	“Low-profile rugged polycarbonate full-cover lens housing with post-painted steel back plate for a high level of security and durability. Luminaire designs are engineered for heat management and tested in an in-house thermal chamber for environments up to 40°C ambient temperature.

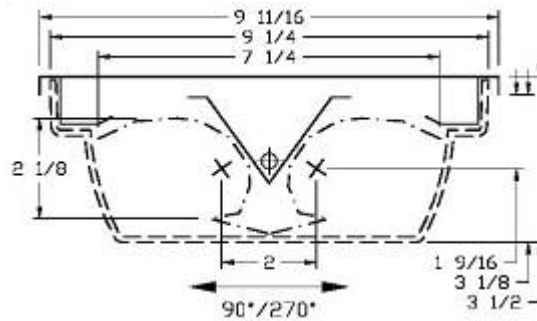
### Description of Luminaire Tested



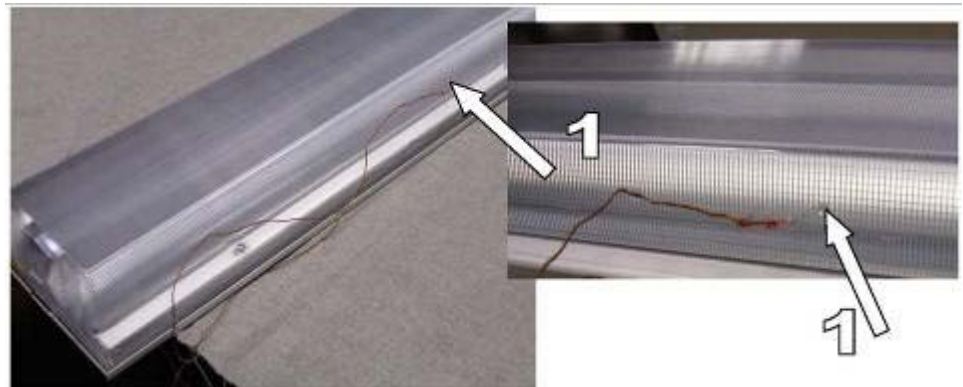
## Test Configuration Description

Schematic of product and/or mounting configuration

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BK 09-108-02



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BK 09-108-02  
Temperature  
Measurement  
Location



Comments regarding product geometry and mounting:

All testing performed with the unit operated at 120V AC in a 25 +/-1 degree Celsius free air ambient. A Type J thermocouple was attached to the surface of the unit to measure operating temperature.

## Temperature Measurement

CALiPER BK 09-108-02

Location #1 on center front of  
luminaire

Temperature

43.9°C

**Measured Photometric Quantities -- Test Results: Light Output & Efficacy**

**Light Output & Efficacy Values**

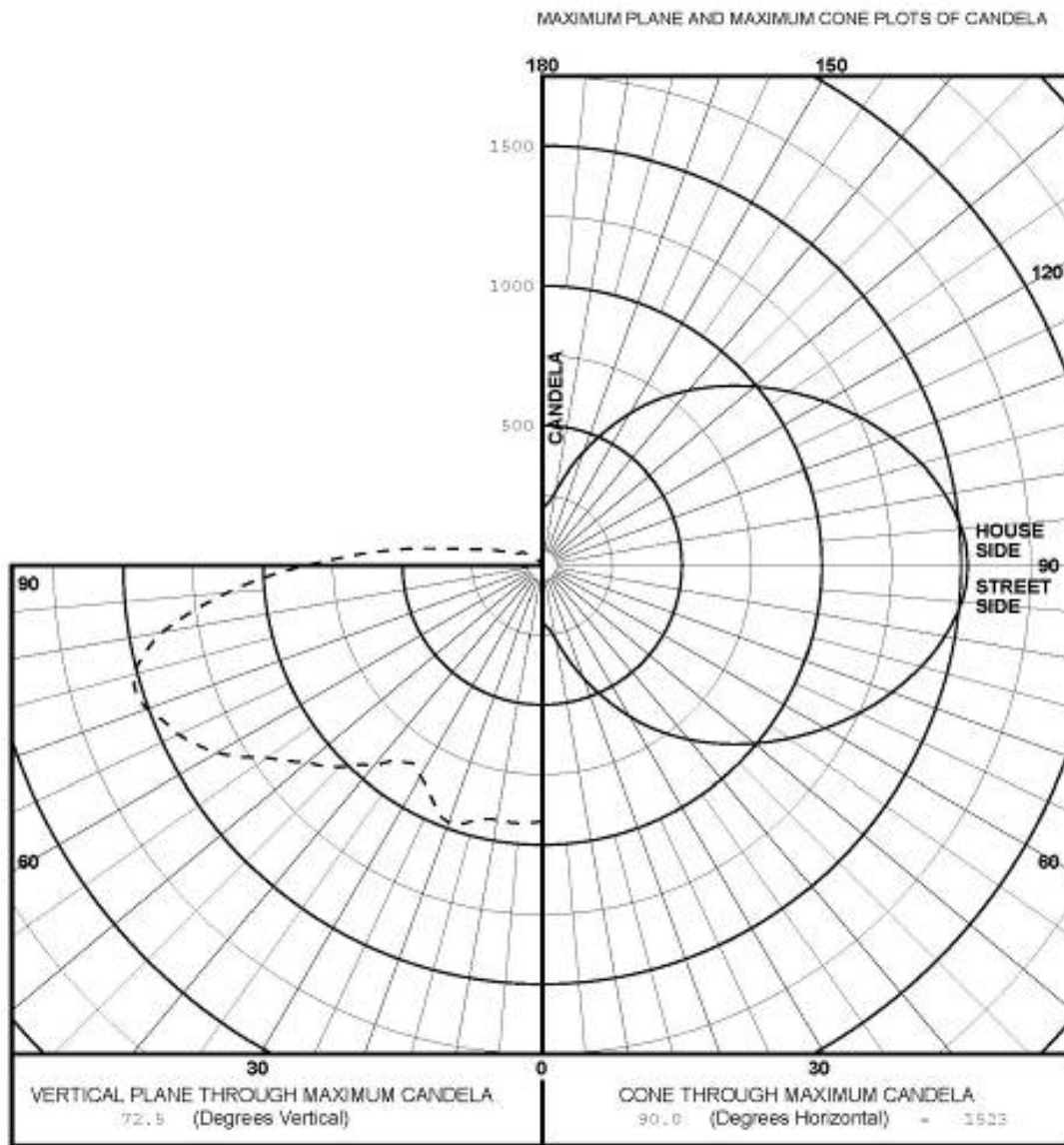
Test identifier	Measured Radiant Flux (milliwatts)	Measured Power (Watts)	Total Measured Light Output (lumens)	Calculated Luminaire Efficacy (lumens/Watt)
CALiPER BK 09-108-01	9188 mW	102.9 W	5787 lm	56.2 lm/W
CALiPER BK 09-108-02	--	104.2 W	5804 lm	55.7 lm/W

**Measured Power Factor**

CALiPER BK 09-108-01	1.0
CALiPER BK 09-108-02	1.0

## Intensity Distribution Plots

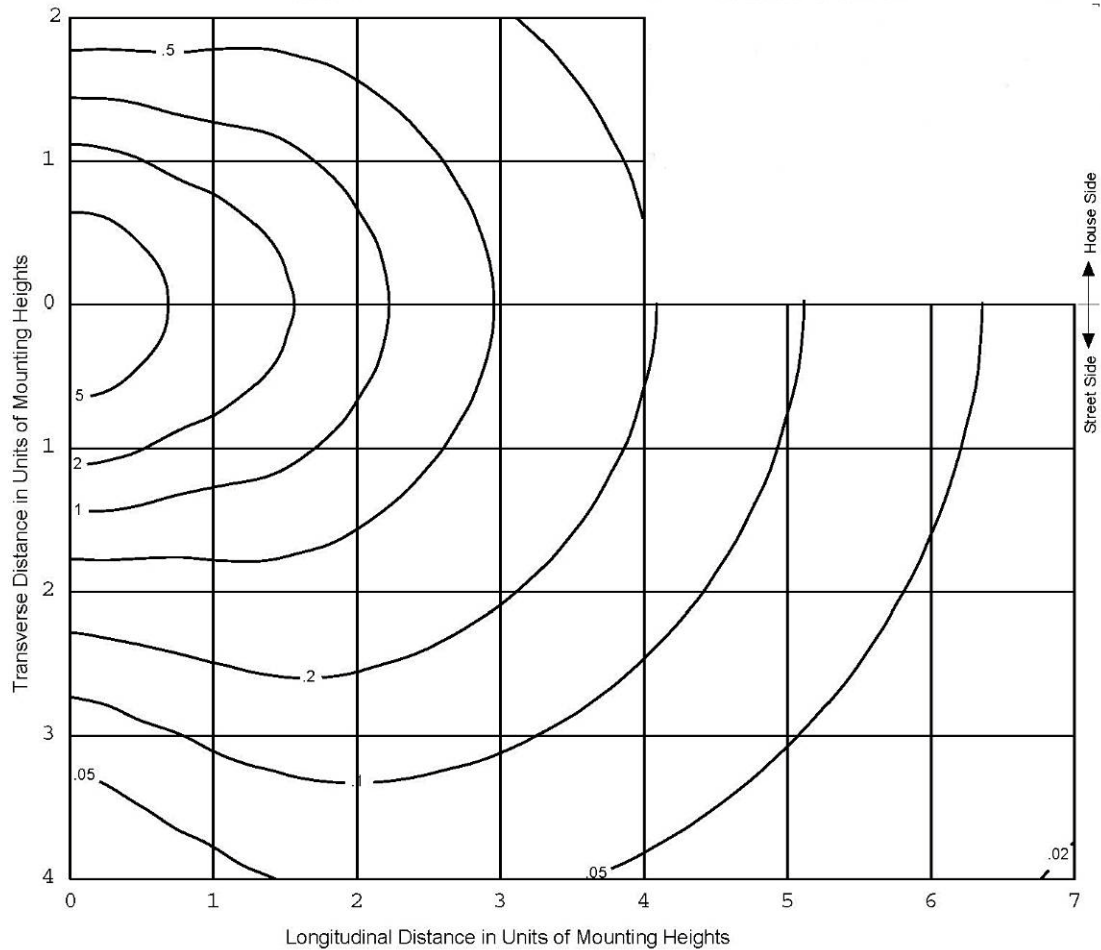
CALiPER BK 09-108-02



## Illuminance Plots

Isofootcandle plots (mounting height 10ft)

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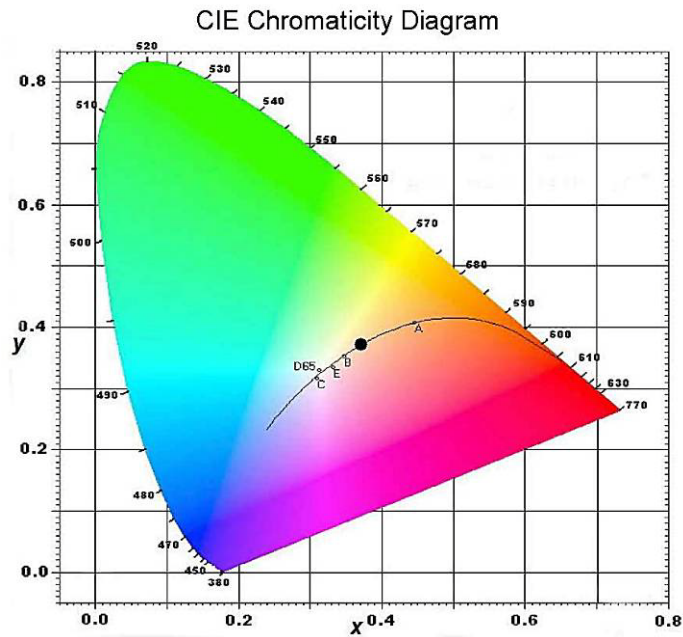




## Measured Photometric Quantities -- Test Results: Color Metrics

Test identifier: CALiPER BK 09-108-01

### Chromaticity Diagram



Correlated Color Temperature-CCT (K)

4253

Duv

0.002

Chromaticity Coordinates

x

y

0.3709

0.3742

Chromaticity Coordinates

u'

v'

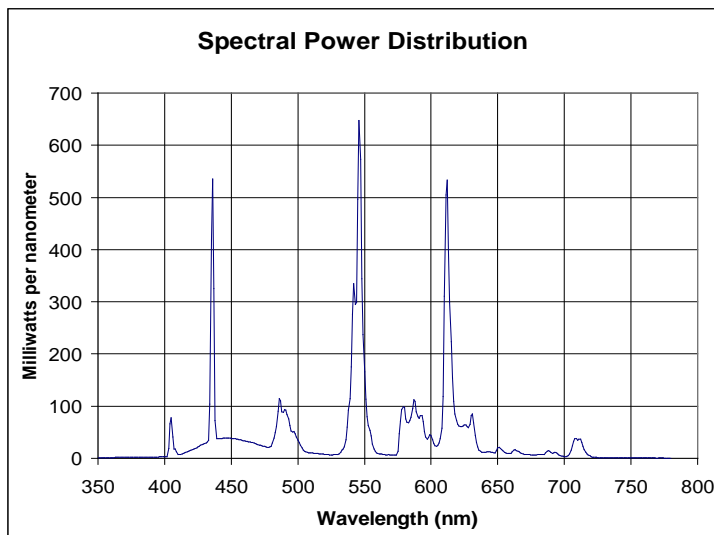
0.2198

0.4990

CRI

80

### Spectral Power Distribution Curve





## Appendix A: Description of Test Conditions, Test Configuration, Test Procedures

### Summary of Luminaire Tests Conducted

References	ITL #64140, CALiPER BK 09-108-01, BK 09-108-02
Date Testing Completed	February 11, 2010
List of Tests Performed	Spectroradiometry & Goniophotometry following IESNA LM-79

#### Photometric equipment used

CALiPER	Yokogawa WT210 Digital Power Meter
BK 09-108-01	Optronic Laboratories OL770 Spectroradiometer
Spectroradiometer	ITL 1.5 Meter Diameter Integrating Sphere, 4 $\pi$ Geometry
	Kikusui PCR500L AC Power Source

For this test, the integrating sphere was calibrated using a directional incandescent flux standard with a distribution similar to the luminaire under test, per IESNA LM78-07.

CALiPER	ITL Moving Mirror Goniophotometer – 33.25' Test Distance
BK 09-108-02	Yokogawa WT210 Digital Power Meter
Goniophotometer	Kikusui PCR4000LA AC Power Source
	Omega HH-81 Digital Thermometer with Type J thermocouple

Orientation of product during seasoning, stabilization and photometric measurements	The luminaire was supplied by client with new lamps. ITL seasoned the lamps for 100 hours prior to testing. The luminaire was prewarmed overnight before each test. Stabilization data was recorded to assure stable operation (stabilization data available on request). Distribution photometry and input electrical data were measured with the unit mounted on the goniophotometer. CCT, CRI, x/y and u'/v' chromaticity coordinates, SPD, total flux, and input electrical data were measured with the unit operating in the integrating sphere. In order to measure the mean performance, twenty data sets were averaged using the Optronic OL770. A Type J thermocouple was attached to the surface of the unit to measure operating temperature (see photograph in the report for location). All data are traceable to the National Institute of Standards and Technology. All testing performed with the unit operated at 120V AC in a 25 +/-1 degree Celsius free air ambient.
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#### Verification that test conditions comply with LM-79

	<u>BK 09-108-01</u>	<u>BK 09-108-02</u>
Measured ambient temperature	25°C	25°C
Measured voltage during testing	120 V	120 V
Measured current during testing	0.861 A	0.872 A
Measured power during testing	102.9 W	104.2 W
Calculated power factor during testing	1.0	1.0

**Appendix B: Tabulated Spectral Power Distribution**

(CALiPER BK 09-108-01)

Wavelength (nm)	Spectral Flux (mW/nm)	Wavelength (nm)	Spectral Flux (mW/nm)
350	1.16738	570	6.35843
360	1.30161	580	97.47240
370	1.94335	590	79.38038
380	1.86676	600	44.17953
390	2.23573	610	310.79740
400	3.01411	620	65.22494
410	6.93966	630	81.89293
420	15.51388	640	11.41178
430	28.53940	650	20.09745
440	37.45708	660	9.33647
450	38.23358	670	7.48206
460	33.41158	680	7.15333
470	26.03507	690	11.46466
480	23.14255	700	3.58499
490	93.02003	710	34.79286
500	34.59168	720	3.34019
510	10.48017	730	1.35778
520	7.67618	740	1.02493
530	7.07794	750	0.86234
540	175.29204	760	0.84903
550	165.65254	770	0.50461
560	9.37190	780	0.33690

## APPENDIX C: IES Summary Data

CALiPER BK 09-108-02

IES HEADER ENTRIES

CATALOG NUMBER: BK 09-108

LUMINAIRE: FABRICATED METAL HOUSING WITH WHITE PAINTED GENERAL INTERIOR FINISH, FORMED TWO PIECE MULTI-FACETED METAL REFLECTOR WITH PREMIUM SPECULAR FINISH, CLEAR PRISMATIC PASTIC DROP LENS, LENS PRISMS IN AND OUT.

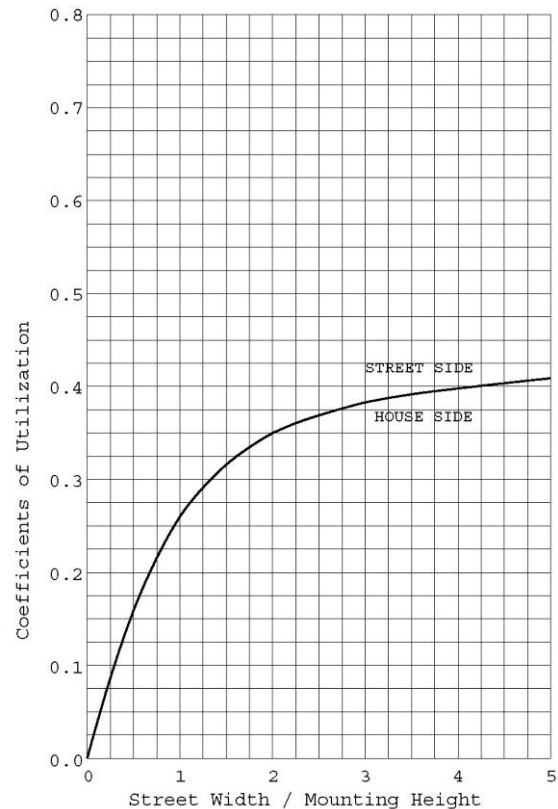
LAMPS: TWO 54-WATT T-5 PHILIPS F54T5/841 HO LINEAR FLUORESCENTS, HORIZONTAL POSITION.

BALLAST: ADVANCE ICN-2S54-90C

NOTE: DATA SHOWN IS ABSOLUTE FOR THE SAMPLE PROVIDED AT RATED INPUT VOLTAGE (120VAC, 60Hz) TO THE BALLAST.

THE 0 DEGREE PLANE IS PARALLEL WITH THE LAMPS.

TOTAL INPUT WATTS = 104.2 AT 120.0 VOLTS, 0.872 AMPS.



IES Classification: Noncutoff

	Lumens	% of Fixture
DOWNWARD STREET SIDE	2585	44.5
DOWNWARD HOUSE SIDE	2585	44.5
DOWNWARD TOTAL	5169	89.1
UPWARD STREET SIDE	317	5.5
UPWARD HOUSE SIDE	317	5.5
UPWARD TOTAL	635	10.9
TOTAL FLUX	5804	100.0

EFFICACY = 55.7 Lm/W

FLUX DISTRIBUTION BY SOLID ANGLE  
(PER IESNA TM-15-07, LUMINAIRE CLASSIFICATION SYSTEM FOR OUTDOOR LUMINAIRES)

	LUMENS	PERCENT OF FIXTURE
FORWARD LIGHT	2585	44.5
FL ( 0- 30)		6.7
FM ( 30- 60)		16.2
FH ( 60- 80)		15.3
FVH( 80- 90)		6.3
BACK LIGHT	2585	44.5
BL ( 0- 30)		6.7
BM ( 30- 60)		16.2
BH ( 60- 80)		15.3
BVH( 80- 90)		6.3
UPLIGHT	635	10.9
UL ( 90-100)		6.5
UH (100-180)		4.5
TRAPPED LIGHT	0	0
TOTAL FLUX	5804.	100.0

BACKLIGHT, UPLIGHT, AND GLARE (BUG) RATINGS  
(PER ADDENDUM A FOR IESNA TM-15-07)

BUG RATING: B2 U3 G2

		FIRST DETERMINING SECONDARY SOLID ANGLE*	LUMENS
BACKLIGHT RATING:	B2	BH	886.4
UPLIGHT RATING:	U3	UH	257.1
GLARE RATING:	G2	FVH	367.5

\* NOTE: OTHER DETERMINING SOLID ANGLES MAY FALL INTO THIS SAME CATEGORY. ONLY THE FIRST DETERMINING ANGLES FROM THE TABLES A1-A3 IN THE ADDENDUM ARE SHOWN.

CANDELA TABULATION

STREET SIDE	LATERAL ANGLE										
	0.0	5.0	15.0	25.0	35.0	45.0	55.0	65.0	75.0	85.0	90.0
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	1	2	3	3	4	4	5
145.0	0	0	1	1	2	4	5	7	10	12	12
135.0	3	2	2	3	6	11	22	32	39	44	45
125.0	7	6	7	8	20	35	51	62	73	78	80
115.0	14	14	16	28	46	61	73	83	93	98	99
105.0	24	25	34	64	99	129	162	187	210	220	223
95.0	36	39	121	202	291	353	438	479	554	561	581
92.5	41	54	161	268	366	452	539	601	668	704	704
90.0	45	71	196	332	440	551	639	731	796	849	844
87.5	55	88	233	390	520	640	748	849	937	991	996
85.0	68	105	263	438	592	734	851	961	1059	1128	1132
82.5	87	125	287	477	645	811	947	1079	1175	1261	1262
80.0	111	145	307	503	686	861	1015	1160	1281	1362	1380
77.5	137	168	320	520	707	893	1063	1223	1349	1448	1458
75.0	169	196	332	527	722	904	1088	1254	1397	1495	1512
72.5	205	225	344	525	724	905	1082	1253	1404	1508	1523
70.0	243	263	357	519	717	899	1072	1231	1383	1485	1505
67.5	287	301	376	515	702	886	1059	1213	1351	1449	1464
65.0	329	344	399	513	686	865	1038	1189	1326	1417	1436
62.5	381	389	432	517	661	840	1011	1160	1291	1381	1393
60.0	427	437	471	529	644	805	972	1119	1249	1333	1344
57.5	480	489	517	551	639	770	921	1061	1183	1261	1278
55.0	525	534	557	580	641	761	891	1011	1123	1192	1204
52.5	576	584	598	620	652	753	872	978	1076	1135	1152
50.0	619	624	633	656	670	737	854	960	1039	1092	1101
47.5	665	669	665	696	694	731	837	928	1013	1057	1066
45.0	707	707	697	727	721	739	806	903	970	1018	1023
42.5	741	740	729	756	749	758	791	870	934	965	969
40.0	769	772	756	785	781	776	791	837	898	927	937
37.5	796	797	787	814	820	797	804	829	860	881	885
35.0	816	820	811	841	857	834	822	830	845	858	862
32.5	835	836	833	860	889	876	848	852	848	850	850
30.0	847	851	850	873	909	915	890	873	873	874	872
25.0	875	878	881	889	919	949	961	950	937	931	928
20.0	898	901	907	908	914	933	957	971	977	977	977
15.0	912	914	922	921	922	923	928	935	942	945	947
10.0	917	918	924	927	927	927	927	927	926	926	925
5.0	918	919	921	922	926	926	926	925	926	925	926
0.0	916	916	916	916	916	916	916	916	916	916	916

Total time this unit was energized for all testing is 232.0 hours.