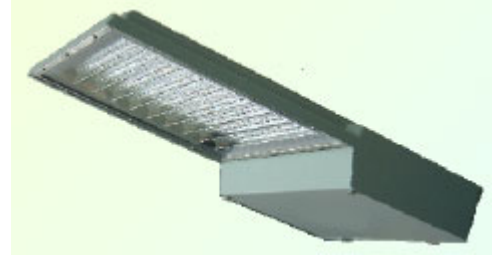


# OkSolar 488500 LED Outdoor Luminaires

## 1.0 PURPOSE

The purpose of this specification is to provide the minimum performance requirements for the LED Outdoor Luminaire Fixture. This specification refers to definitions and practices described in "Roadway Lighting" published in the American National Standard Practice for Roadway Lighting (ANSI / IESNA RP-8-00)



## 2.0 PHYSICAL AND MECHANICAL REQUIREMENT

### 2.1 General

2.1.1 Usage: Fixtures shall fit into existing Luminaire arm/polls with a diameter range from 1-3/4" to 2-3/8".

2.1.2 Installation requirements: Installation of an LED fixture into existing pole/mast arm shall only require the removal of the existing light fixture and shall connect directly to existing electrical wiring. Installation shall not require special tools.

2.1.3 The module shall provide Type 2 radiation pattern and must meet minimum roadway surface candela requirements as per IES national roadway standard.

### 2.2 Physical Dimension

2.2.1 Nominal Fixture size: 15"X24.5"X4.5"

## 3.0 LED Outdoor Luminaire Fixture

3.1 The LED fixture shall provide a complete replacement of the light fixture.

3.2 The fixture lens shall be hard coated complying with (SAE) J576.

3.3 The fixture lens may be a replaceable part, without the need to replace the complete fixture.

3.4 The fixture power supply shall be a replaceable part, without the need to replace the complete fixture.

3.5 The fixture power supply shall be Class 2 UL approved.

3.6 The fixture shall be CSA/UL approved.

3.7 The fixture shall provide receptacle to connect to all standard photocell controller/timer.

## 4.0 Environmental Requirements

4.1 The LED fixture shall be rated for use in the ambient operating temperature range of -40°C to 50°C.

4.2 The LED fixture shall be protected against dust and moisture intrusion as per NEMA standard 250-1991 type 4.

4.3 The lens surface shall be smooth on the outside to reduce dust and dirt collection.

4.4 The LED fixture shall be rated to withstand mechanical vibration per MIL-STD 883, test method 2007, using three 4-minute cycles along x, y and z axis, at a force of 2.5 Gs, with a frequency sweep from 2 Hz to 120 Hz.

## 5.0 Construction

5.1 The light fixture shall be a single, self-contained device, not requiring on-site assembly for installation into existing roadway mounting.

5.2 The assembly and manufacturing process for the light fixture shall be designed to assure all internal LED and electronic components are adequately supported to withstand mechanical shock and vibration from high winds and other sources.

5.3 The lens shall be polycarbonate UV stabilized.

## 6.0 Materials

- 6.1 Materials used for the lens and LED module construction shall conform to ASTM specifications where applicable.
- 6.2 Enclosures containing the power supply and electronic components of the LED module shall be made of UL94VO flame retardant material.

**7.0 Module Identification**

- 7.1 Each LED light fixture shall be identified on the backside with the manufacturer’s name and serial number.
- 7.2 The following operating characteristics shall be identified: nominal operating voltage, power consumption and Volt-Ampere.
- 8.0 Photometric Requirements
  - 8.1 Photometric measurement shall be documented by an independent test lab report according to IESNA specification.
  - 8.2 All certified independent test lab report shall include IES format file for use with lighting software.
  - 8.3 Chromaticity The standard color for the LED light fixture shall be white. The color temperature shall be typical 5500K +/- 50

**9.0 ELECTRICAL**

- 9.1 Voltage Range
- 9.2 LED light fixture shall operate from a 47-63 Hertz ac line power over a voltage range from 90 Vac RMS to 264 Vac RMS.
- 9.3 Nominal operating voltage for all measurements shall be 220+/- 3 Vac rms.
- 9.4 Fluctuation in the line over the voltage range shall not affect luminous intensity by more than +/- 10%.
- 9.5 Transient Voltage Protection
  - 9.5.1 The LED fixture and the on-board circuitry shall include voltage surge protection to withstand high-repetition noise transients and low-repetition, high-energy transients as stated in section 2.1.6, NEMA Standard TS-2, 1992.
- 9.6 EMC Noise
  - 9.6.1 The LED fixture and the on-board circuitry must meet Federal Communications Commission (FCC) Title 47, subpart B, section 15 regulations concerning the emission of electronic noise.
- 9.7 Power Factor (PF) and AC Harmonics
  - 9.7.1 LED light fixture shall provide a power factor of .9 or greater.
  - 9.7.2 Total Harmonic distortion shall be less than 20%.
- 9.8 Power Consumption

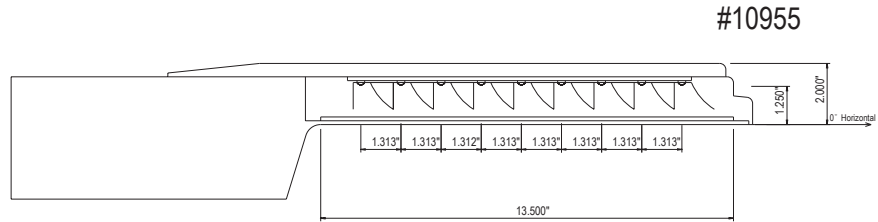
Watts	Replaces HPS	Equal to HPS Lumen Efficiency of
48W	75W	3,300
60W	125W	4,400
80W	150w	6,000
100W	175W	7,600
125W	200W	9,400
140W	250W	10,600
180W	320W	13,800

- 9.8.1 Typical power consumption for each model shall be as follows;
  - \* Note: HPS wattages do not include ballast Efficiency and PF
  - \*\* Note: OkSolar Luminaires produce high quality white light @ 5500K color temperature which greatly enhances the night time visibility, color rendition & Scotopic (night time) visibility of the human eye.

**10.0 QUALITY CONTROL**

The LED Light manufacturer’s quality management system shall be ISO 9001 Registered.

ELECTRICAL VALUES: 120.0VAC, 1.462A, 174.20W  
 NOTE: THIS TEST WAS PERFORMED USING THE CALIBRATED  
 PHOTODETECTOR METHOD OF ABSOLUTE PHOTOMETRY.\*



IES CLASSIFICATION: **TYPE II**  
 LONGITUDINAL CLASSIFICATION: **SHORT**  
 CUTOFF CLASSIFICATION: **CUTOFF**

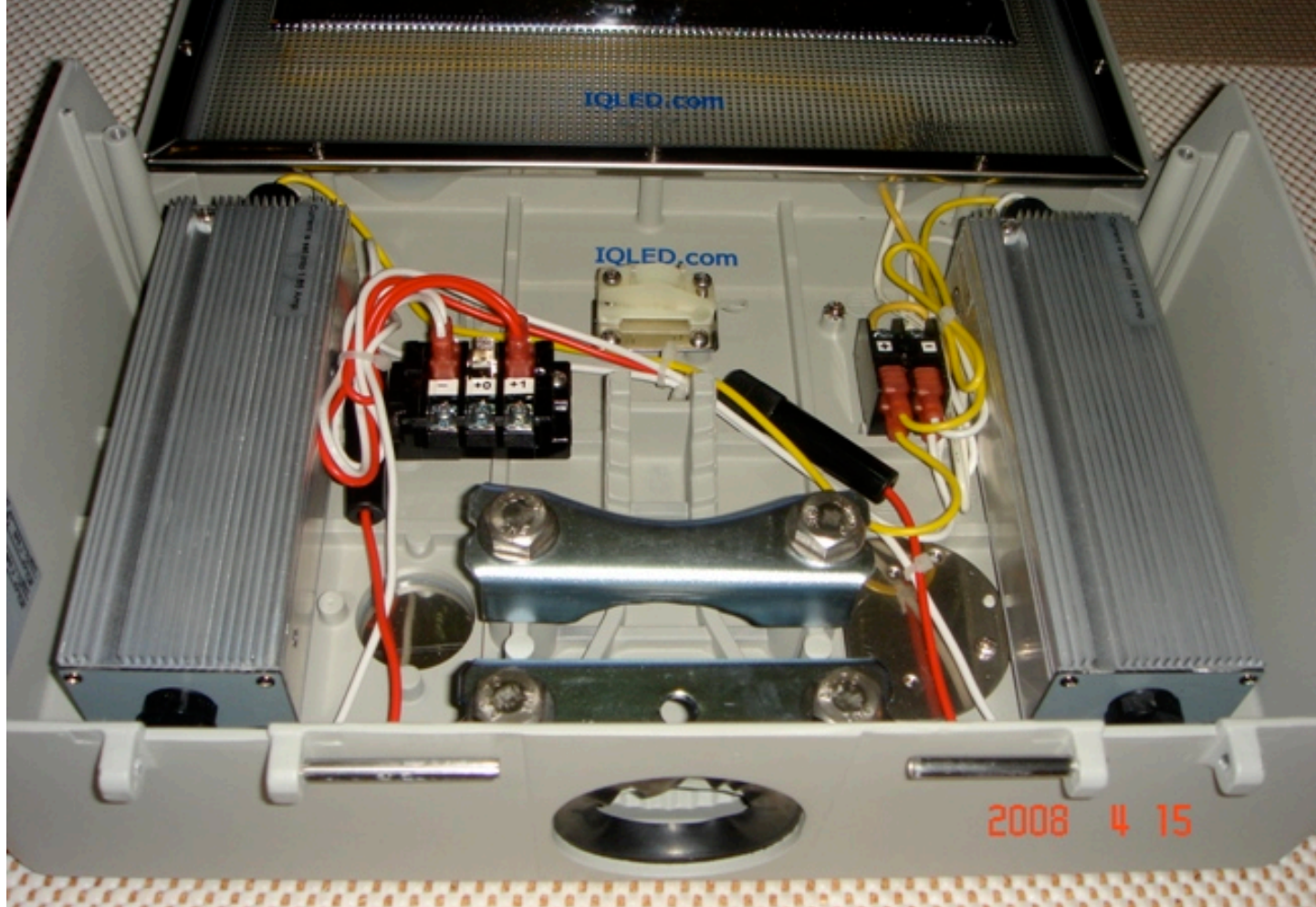
\*\*CUTOFF DESIGNATION IS NOT DEFINED FOR ABSOLUTE PHOTOMETRIC TESTS. THIS CUTOFF RATING IS BASED ON THE MAXIMUM CANDELA READING PER LUMINAIRE RATED AT 1000 LUMENS.

FLUX DISTRIBUTION

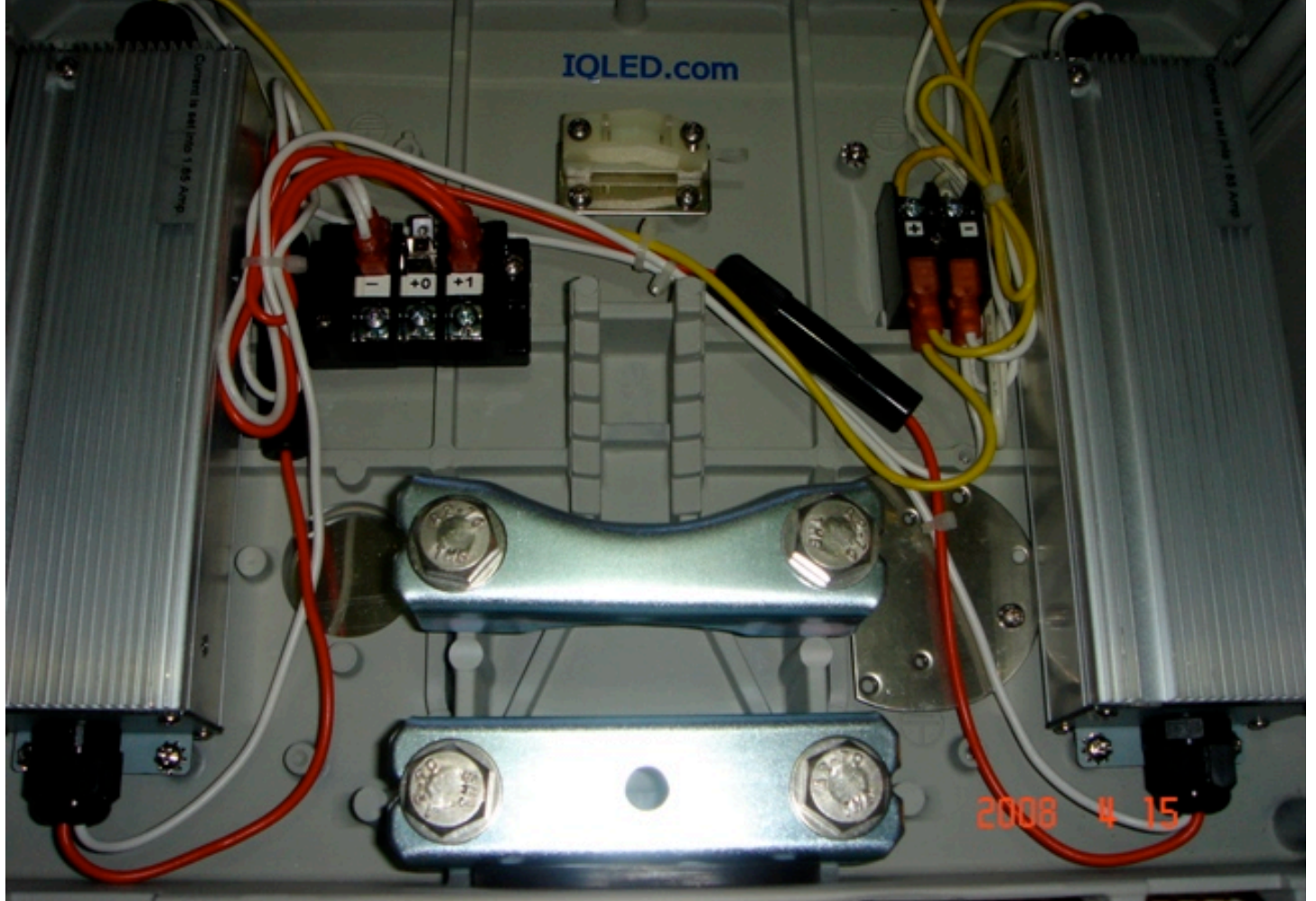
LUMENS	DOWNWARD	UPWARD	TOTALS
HOUSE SIDE	1640	0	1640
STREET SIDE	4819	0	4819
TOTALS	6459	0	6459

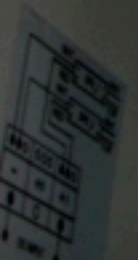
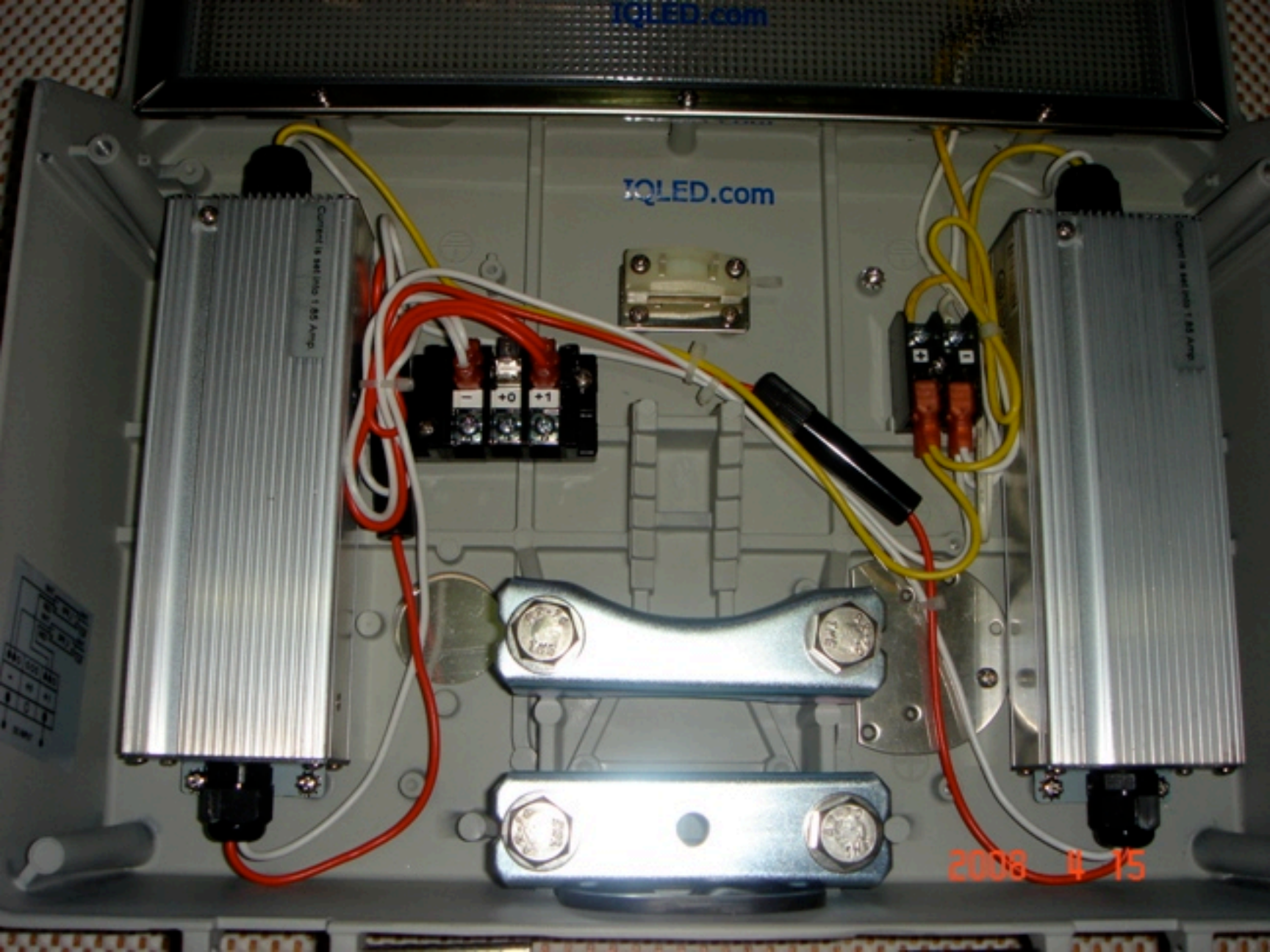
\*DATA WAS ACQUIRED USING THE CALIBRATED PHOTODETECTOR METHOD OF ABSOLUTE PHOTOMETRY. A UDT MODEL #211 PHOTODETECTOR AND UDT MODEL #S370 OPTOMETER COMBINATION WERE USED AS A STANDARD. A SPECTRAL MISMATCH CORRECTION FACTOR WAS EMPLOYED BASED ON THE SPECTRAL RESPONSIVITY OF THE PHOTODETECTOR AND THE SPECTRAL POWER DISTRIBUTION OF THE TEST SUBJECT.

Approved By: MG









Current is set to 1.85 Amp

Current is set to 1.85 Amp

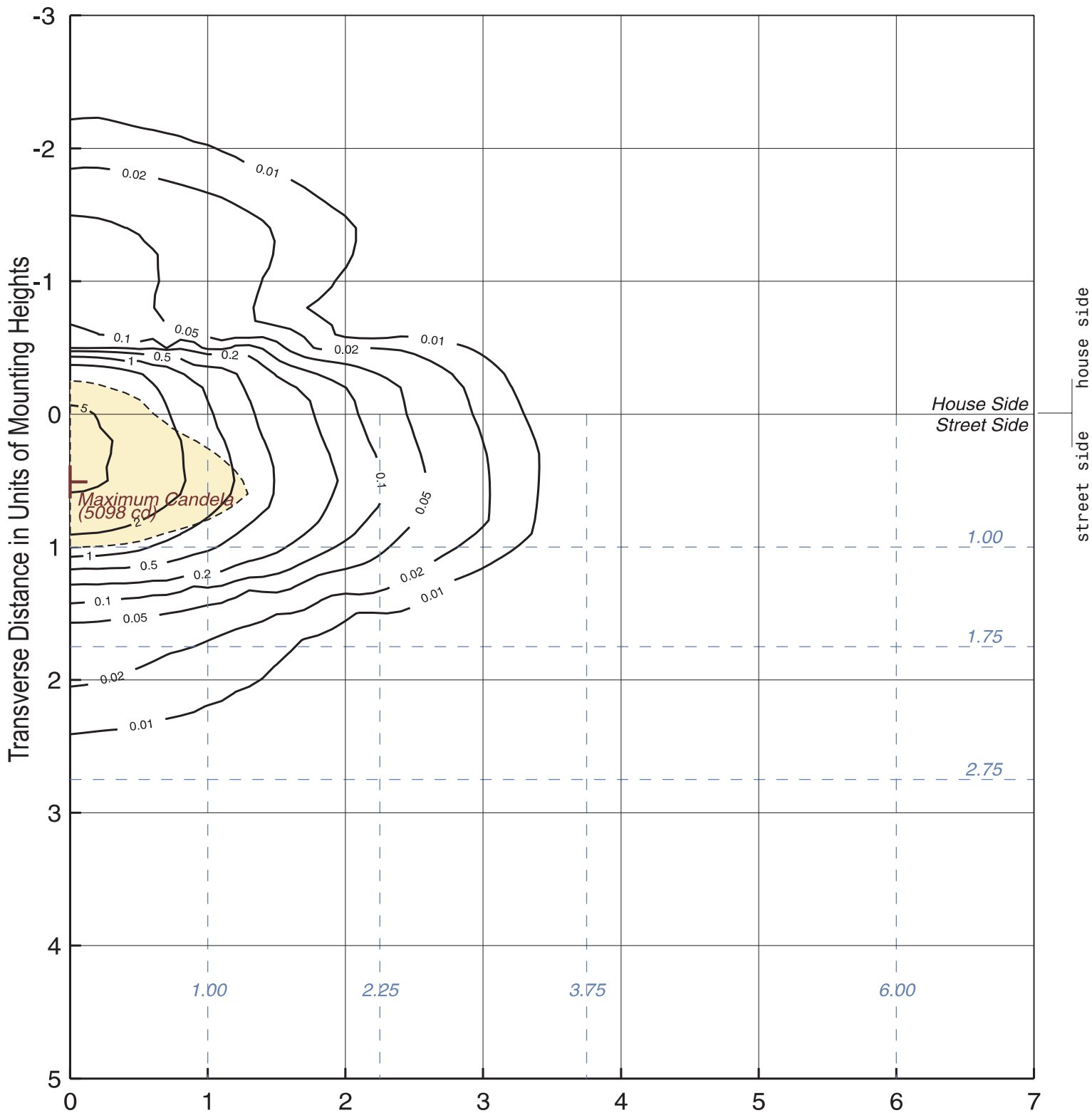
-0 +0 +1

2008 4 15





# ISOFOOTCANDLE LINES OF HORIZONTAL ILLUMINATION VALUES BASED ON 25.00 FOOT MOUNTING HEIGHT



PROJECTION OF HALF-MAX CANDELA CONTOUR

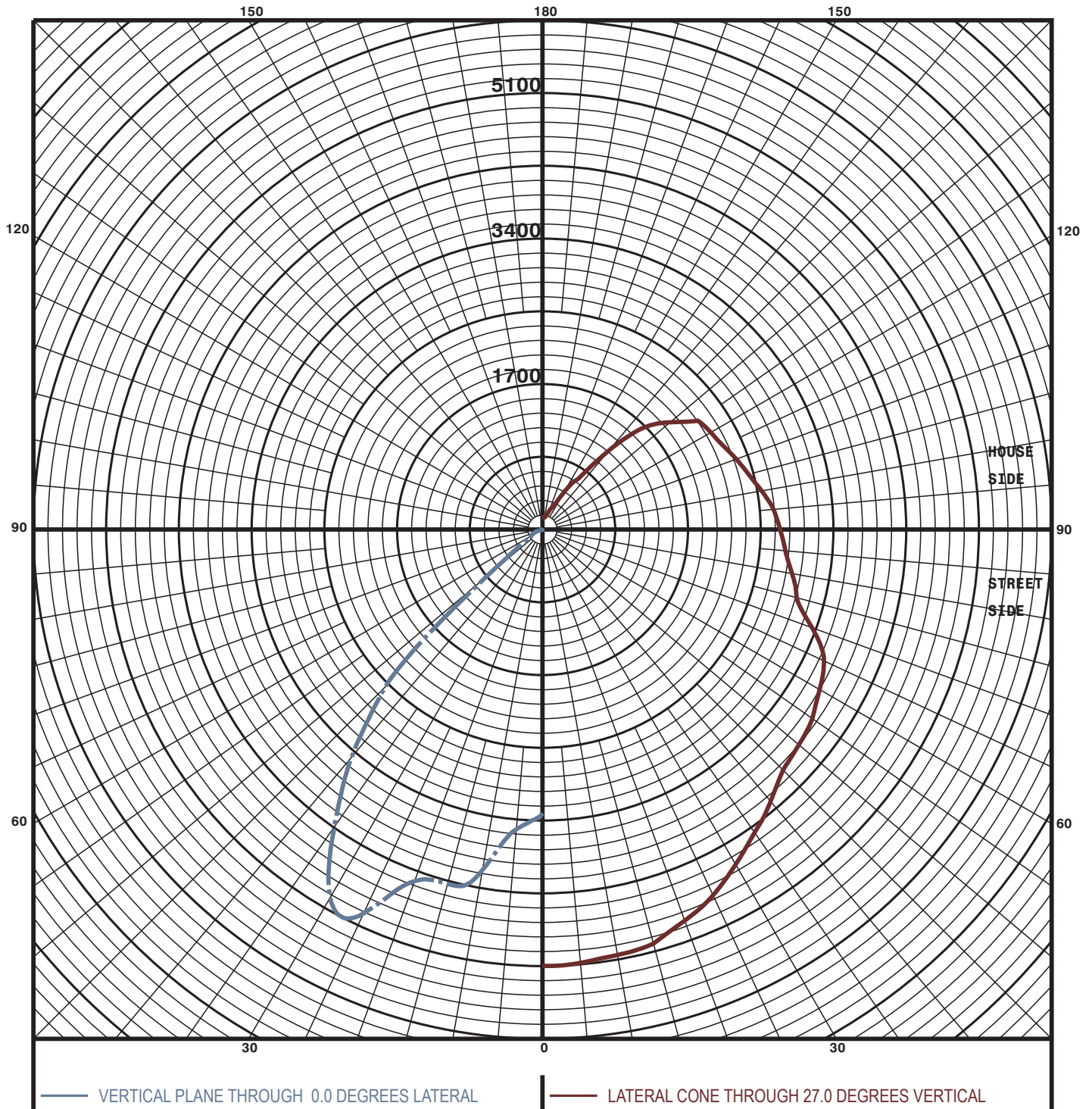


	0	5	15	25	35	45	55	65	75	85	90
180	0	0	0	0	0	0	0	0	0	0	0
175	0	0	0	0	0	0	0	0	0	0	0
165	0	0	0	0	0	0	0	0	0	0	0
155	0	0	0	0	0	0	0	0	0	0	0
145	0	0	0	0	0	0	0	0	0	0	0
135	0	0	0	0	0	0	0	0	0	0	0
125	0	0	0	0	0	0	0	0	0	0	0
115	0	0	0	0	0	0	0	0	0	0	0
105	0	0	0	0	0	0	0	0	0	0	0
95	0	0	0	0	0	0	0	0	0	0	0
90	0	0	0	0	0	0	0	0	0	0	0
87.5	1	2	3	0	2	3	3	2	5	5	2
85	11	9	9	14	12	15	17	15	15	18	18
82.5	19	17	17	17	20	23	23	20	24	29	23
80	23	23	21	23	26	30	38	36	32	51	51
77.5	29	29	30	30	30	50	53	53	81	117	95
75	51	51	50	53	51	68	78	68	215	212	171
72.5	78	72	69	69	66	86	92	143	433	355	291
70	95	92	89	90	96	101	111	347	702	515	428
67.5	110	107	107	110	111	108	164	702	1035	703	592
65	141	138	134	128	114	155	389	1046	1295	862	748
62.5	150	149	132	128	162	237	877	1471	1516	1022	895
60	148	146	131	176	258	518	1346	1851	1713	1207	1077
57.5	190	191	218	285	419	1172	1758	2224	1850	1343	1213
55	319	320	340	442	912	1771	2206	2554	1989	1481	1352
52.5	470	467	548	909	1716	2179	2608	2870	2162	1621	1492
50	861	853	1155	1818	2207	2584	3002	3011	2374	1792	1660
47.5	1819	1780	2116	2457	2653	2955	3351	3013	2526	1926	1795
45	2597	2562	2677	2886	3095	3325	3597	3000	2643	2033	1916
40	3468	3444	3543	3681	3941	4094	3734	3101	2780	2228	2102
35	4242	4227	4321	4476	4608	4369	3687	3316	2889	2496	2392
30	4961	4949	4978	4889	4593	4072	3768	3583	3011	2694	2616
27	5098	5084	5009	4715	4320	3974	3851	3630	3074	2850	2778
25	4948	4936	4819	4497	4186	3961	3891	3611	3133	2979	2903
20	4372	4359	4321	4239	4121	4031	3843	3442	3191	3055	2996
15	4286	4278	4285	4272	4154	3911	3615	3384	3253	3145	3104
10	4038	4028	3968	3852	3722	3600	3531	3504	3435	3355	3331
5	3515	3511	3504	3489	3468	3456	3427	3403	3378	3345	3328
0	3314	3314	3314	3314	3314	3314	3314	3314	3314	3314	3314

CANDELA DISTRIBUTION

	95	105	115	125	135	145	155	165	175	180
180	0	0	0	0	0	0	0	0	0	0
175	0	0	0	0	0	0	0	0	0	0
165	0	0	0	0	0	0	0	0	0	0
155	0	0	0	0	0	0	0	0	0	0
145	0	0	0	0	0	0	0	0	0	0
135	0	0	0	0	0	0	0	0	0	0
125	0	0	0	0	0	0	0	0	0	0
115	0	0	0	0	0	0	0	0	0	0
105	0	0	0	0	0	0	0	0	0	0
95	0	0	0	0	0	0	0	0	0	0
90	0	0	0	0	0	0	0	0	0	0
87.5	0	0	0	0	0	0	0	0	0	0
85	12	6	5	0	0	0	0	0	0	0
82.5	20	18	17	8	2	0	0	0	0	0
80	24	35	33	26	18	5	0	0	0	0
77.5	44	41	53	45	26	15	5	0	0	0
75	107	42	87	68	42	29	20	17	9	6
72.5	239	42	99	87	69	50	36	30	30	24
70	380	44	87	119	84	81	60	51	50	42
67.5	547	60	81	131	111	89	77	75	75	69
65	681	56	74	117	134	110	95	95	92	93
62.5	826	87	54	110	149	144	120	110	113	114
60	996	177	53	95	132	152	153	141	141	138
57.5	1125	383	68	86	123	152	167	171	173	171
55	1256	715	78	78	117	140	156	176	183	183
52.5	1393	1085	75	74	96	128	143	164	171	174
50	1566	1364	107	78	89	114	134	153	153	165
47.5	1686	1519	215	89	75	99	114	135	150	156
45	1794	1638	452	92	81	92	98	117	134	126
40	2010	1844	1343	171	92	90	87	95	110	108
35	2305	2063	1952	843	150	89	95	108	108	108
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27	2711	2493	2326	2216	1687	717	299	170	138	126
25	2841	2595	2406	2318	2082	1343	669	388	296	273
20	2939	2793	2614	2509	2448	2360	2194	1968	1821	1785
15	3053	2970	2852	2739	2653	2587	2547	2530	2518	2515
10	3301	3260	3194	3061	2946	2861	2811	2775	2763	2774
5	3307	3269	3238	3212	3181	3157	3133	3121	3121	3125
0	3314	3314	3314	3314	3314	3314	3314	3314	3314	3314

MAXIMUM PLANE AND CONE PLOTS OF CANDELA



— VERTICAL PLANE THROUGH 0.0 DEGREES LATERAL

— LATERAL CONE THROUGH 27.0 DEGREES VERTICAL