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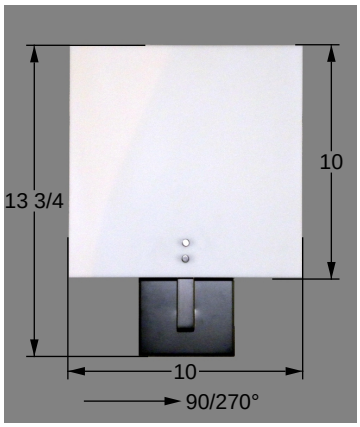
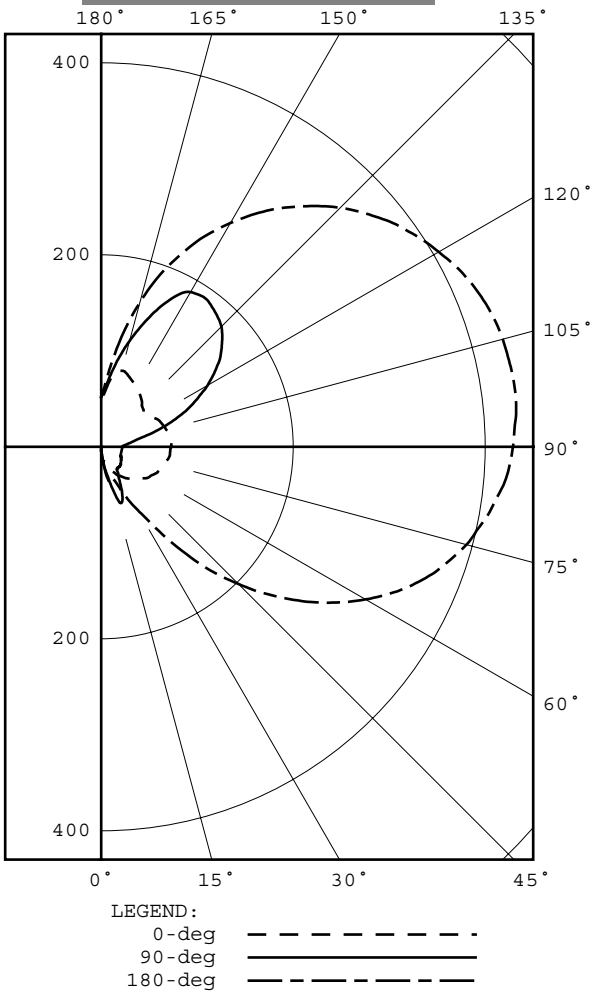
THE LIGHT CENTER OF THE INDUSTRY SINCE 1955
INDEPENDENT TESTING LABORATORIES, INC.
4066 CAMELOT CIRCLE, LONGMONT, CO 80504 USA
PHONE: (303) 442-1255 • FAX: (970) 535-3114 • E-MAIL: itl@itlboulder.com • WEBSITE: www.itlboulder.com

REPORT NUMBER: ITL86070 PAGE: 1 OF 8
ISSUE DATE: 12/01/15
PREPARED FOR: STONE LIGHTING LLC
CATALOG NUMBER: WS225FWBZQ18
LUMINAIRE: FABRICATED DARK BRONZE METAL WALL MOUNTING/DIFFUSER AND SOCKET BRACKETS, 3-PIECE TRANSLUCENT WHITE FROSTED PLASTIC DIFFUSER. OPEN BACK, TOP AND BOTTOM. DIFFUSER FROSTED SIDE OUT.
LAMPS: TWO 18-WATT DOUBLE TWIN TUBE COMPACT FLUORESCENTS, STONE LIGHTING LMPQ18N FLD/E, VERTICAL BASE-DOWN POSITION.
BALLAST: FULHAM NPY-120-213-CFL
INPUT ELECTRICAL: 120.0 VOLTS, 27.8 WATTS, 0.399 AMPS
MOUNTING: WALL
NOTE: CLIENT STATES LAMPS PROVIDED FOR TESTING HAVE BEEN SEASONED FOR A MINIMUM OF 100 HOURS.
REPORT IS BASED ON 1210 LUMENS PER LAMP. *



CANDELA DISTRIBUTION

	0.0	45.0	90.0	135.0	180.0	FLUX
0	3	3	3	3	3	
5	15	14	8	8	10	2
15	19	29	45	55	40	12
25	28	34	51	93	51	26
35	38	38	28	110	112	41
45	48	44	28	175	202	72
55	57	49	25	262	283	113
65	64	55	23	343	349	156
75	69	59	22	403	394	190
85	72	61	22	436	422	211
90	73	61	22	446	429	
95	72	62	26	452	434	219
105	70	62	54	455	433	218
115	66	61	105	446	419	214
125	59	72	148	425	391	201
135	60	98	177	391	352	176
145	69	123	189	337	300	136
155	76	140	169	255	236	85
165	82	118	114	157	156	37
175	61	64	65	72	74	7
180	52	52	52	52	52	



ZONAL LUMEN SUMMARY

ZONE	LUMENS	%LAMP	%FIXT
0- 30	40	1.6	1.9
0- 40	81	3.3	3.8
0- 60	265	11.0	12.6
0- 90	822	34.0	38.9
90-120	651	26.9	30.8
90-130	852	35.2	40.3
90-150	1163	48.1	55.0
90-180	1292	53.4	61.1
0-180	2115	87.4	100.0

TOTAL LUMINAIRE EFFICIENCY = 87.4 % *

CIE TYPE - SEMI-INDIRECT

Checked *B HYRE*
Approved *R BEATTIE*
Lighting Engineer

* SEE ADDENDUM FOR FURTHER INFORMATION

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CANDELA DISTRIBUTION
LATERAL ANGLE

	0.0	5.0	15.0	25.0	35.0	45.0	55.0	65.0	75.0	85.0	90.0	95.0	105.0	115.0
0.0	3	3	3	3	3	3	3	3	3	3	3	3	3	3
2.5	7	7	6	6	6	6	6	5	4	4	4	4	3	3
5.0	15	15	15	15	15	14	13	11	10	9	8	8	7	8
7.5	17	17	18	21	24	25	25	22	19	17	15	15	15	15
10.0	15	15	17	20	26	32	34	32	28	25	24	23	25	26
12.5	16	16	17	20	24	31	38	41	39	34	32	32	36	39
15.0	19	19	20	21	25	29	41	53	53	48	45	45	48	49
17.5	21	21	22	24	26	31	43	62	70	62	58	56	59	58
20.0	24	24	25	26	28	32	44	68	83	69	62	59	64	67
22.5	26	26	27	29	30	33	43	68	86	67	58	53	60	73
25.0	28	29	30	31	32	34	41	63	84	62	51	46	54	74
27.5	31	31	32	33	34	35	39	56	78	56	43	39	46	70
30.0	34	34	35	35	36	37	37	48	68	48	36	32	40	63
32.5	36	36	37	38	38	38	37	42	57	45	33	30	37	56
35.0	38	39	39	40	39	38	37	40	54	36	28	29	42	51
37.5	41	41	42	42	41	40	37	37	47	35	28	29	43	51
40.0	43	43	44	44	43	41	38	35	41	34	28	29	43	55
42.5	46	46	47	46	45	42	39	35	37	33	28	29	42	61
45.0	48	48	49	48	46	44	40	35	34	32	28	30	41	68
47.5	50	50	51	50	48	45	41	35	32	30	27	30	40	77
50.0	52	53	53	52	50	46	42	36	31	29	27	30	40	88
52.5	54	55	55	54	52	48	43	37	30	28	26	30	41	99
55.0	57	57	57	56	53	49	44	38	31	27	25	30	43	112
57.5	59	59	59	58	55	51	45	38	31	26	25	30	46	126
60.0	60	61	61	60	57	52	46	39	31	26	24	30	49	140
62.5	62	63	63	62	58	54	47	40	32	25	23	30	54	154
65.0	64	64	65	63	60	55	48	41	32	25	23	30	58	167
67.5	65	66	66	65	61	56	49	41	33	25	22	30	62	180
70.0	67	67	68	66	62	57	50	42	33	25	22	30	66	191
72.5	68	69	69	67	63	58	51	43	34	25	22	31	70	202
75.0	69	70	70	68	64	59	51	43	34	25	22	32	74	212
77.5	70	71	71	69	65	59	52	43	34	25	22	33	77	220
80.0	71	72	72	70	66	60	52	44	34	25	22	33	80	227
82.5	72	72	72	71	66	60	53	44	35	25	22	34	82	231
85.0	72	73	73	71	67	61	53	44	35	25	22	35	84	236
87.5	72	73	73	71	67	61	53	44	35	25	22	35	85	239
90.0	73	73	73	71	67	61	53	44	35	25	22	35	87	241
92.5	73	73	74	72	67	61	53	45	36	26	23	36	88	244
95.0	72	73	73	72	67	62	54	46	37	29	26	40	91	246
97.5	72	73	73	71	68	62	55	47	39	32	30	44	94	249
100.0	72	72	73	71	68	62	55	48	42	37	35	48	97	252
102.5	71	72	72	71	67	62	56	49	45	43	42	56	104	254
105.0	70	71	72	70	67	62	56	50	51	54	54	67	115	258
107.5	69	70	71	70	67	62	56	51	60	67	67	80	127	261
110.0	68	69	70	69	66	62	57	55	71	81	80	94	140	266
112.5	67	68	69	68	65	61	57	62	84	94	93	107	155	273
115.0	66	66	67	67	65	61	60	71	98	106	105	119	170	279
117.5	64	65	66	66	64	61	65	81	112	118	116	131	185	285
120.0	62	63	64	64	63	63	72	92	127	130	128	143	199	290
122.5	61	61	63	63	63	67	80	105	141	142	138	155	213	296
125.0	59	59	61	62	65	72	89	117	155	153	148	166	227	302
127.5	57	58	61	64	69	78	97	130	169	162	157	175	239	306
130.0	58	58	62	66	73	84	107	142	181	170	164	183	248	309
132.5	59	60	63	69	78	91	116	154	192	177	171	190	253	310
135.0	60	61	66	73	82	98	124	166	200	182	177	195	254	309
137.5	63	64	69	77	87	104	133	177	207	186	181	198	254	307
140.0	65	66	72	81	93	111	141	186	211	189	184	200	252	302
142.5	67	68	75	85	98	117	149	194	212	190	187	202	249	296
145.0	69	70	79	89	102	123	156	198	211	191	189	202	244	287
147.5	71	73	82	92	106	128	162	199	208	190	188	200	237	274
150.0	73	75	84	95	111	133	166	196	201	187	186	196	227	259
152.5	75	76	86	98	115	138	166	189	191	180	180	187	214	240
155.0	76	78	89	101	118	140	163	178	177	168	169	175	197	219
157.5	78	80	91	104	120	139	156	166	162	155	156	161	180	199

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ISSUE DATE: 12/01/15
PREPARED FOR: STONE LIGHTING LLC

CANDELA DISTRIBUTION
LATERAL ANGLE

	0.0	5.0	15.0	25.0	35.0	45.0	55.0	65.0	75.0	85.0	90.0	95.0	105.0	115.0
160.0	80	82	93	105	120	135	147	150	147	142	142	147	161	177
162.5	82	83	93	105	117	128	134	135	132	128	128	132	143	157
165.0	82	83	92	101	111	118	120	119	116	114	114	117	126	136
167.5	81	82	88	95	102	105	105	104	102	100	101	103	109	117
170.0	78	78	82	86	90	91	91	89	88	87	88	89	93	100
172.5	70	70	72	74	76	77	77	76	76	75	76	77	79	83
175.0	61	61	62	63	64	64	64	65	65	65	65	66	67	68
177.5	54	54	54	55	55	55	55	56	56	56	56	56	57	57
180.0	52	52	52	52	52	52	52	52	52	52	52	52	52	52

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CANDELA DISTRIBUTION
LATERAL ANGLE

	125.0	135.0	145.0	155.0	165.0	175.0	180.0
0.0	3	3	3	3	3	3	3
2.5	3	4	4	4	4	4	4
5.0	8	8	9	9	10	9	10
7.5	16	17	18	18	18	18	18
10.0	27	29	29	30	30	29	29
12.5	40	41	43	42	40	37	37
15.0	51	55	54	50	45	40	40
17.5	63	67	61	53	46	40	39
20.0	76	77	67	56	47	38	37
22.5	88	85	75	62	51	41	40
25.0	92	93	83	71	59	51	51
27.5	92	99	92	81	70	64	64
30.0	87	104	104	93	80	77	76
32.5	81	110	118	107	91	91	91
35.0	74	110	124	123	108	115	112
37.5	80	122	141	147	131	138	134
40.0	90	137	161	172	160	162	158
42.5	103	155	183	199	189	185	181
45.0	118	175	206	224	216	207	202
47.5	134	196	231	248	243	229	224
50.0	151	218	254	272	267	251	244
52.5	169	240	277	295	289	270	264
55.0	188	262	300	317	310	290	283
57.5	206	283	321	338	331	309	301
60.0	225	304	343	358	351	326	318
62.5	242	324	362	377	369	343	334
65.0	259	343	381	395	386	358	349
67.5	275	360	398	412	401	371	362
70.0	290	376	413	425	414	383	374
72.5	303	390	427	438	427	394	384
75.0	315	403	439	450	438	403	394
77.5	325	413	449	460	447	412	401
80.0	333	422	459	469	455	419	409
82.5	340	430	467	477	463	426	415
85.0	345	436	473	483	469	432	422
87.5	350	442	479	488	474	436	426
90.0	354	446	483	492	479	440	429
92.5	357	449	486	495	481	442	431
95.0	360	452	488	497	483	444	434
97.5	363	455	490	498	484	446	435
100.0	365	456	490	498	484	446	435
102.5	366	455	489	497	482	445	434
105.0	368	455	487	494	480	443	433
107.5	368	453	484	491	477	441	431
110.0	370	452	481	487	473	437	428
112.5	371	449	476	482	468	433	424
115.0	373	446	471	476	462	428	419
117.5	373	442	465	469	455	422	413
120.0	374	437	458	461	448	416	406
122.5	374	432	450	452	439	408	399
125.0	373	425	442	443	430	400	391
127.5	372	418	432	433	419	391	383
130.0	369	410	422	421	409	381	373
132.5	365	401	411	409	396	371	363
135.0	359	391	398	395	383	359	352
137.5	353	380	385	382	370	347	340
140.0	344	367	371	367	355	334	327
142.5	333	353	355	351	340	320	314
145.0	320	337	339	334	324	306	300
147.5	303	319	320	316	307	290	285
150.0	284	299	301	298	289	274	269
152.5	263	278	281	278	270	257	253
155.0	240	255	259	257	251	239	236
157.5	217	231	237	236	230	220	217

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CANDELA DISTRIBUTION
LATERAL ANGLE

	125.0	135.0	145.0	155.0	165.0	175.0	180.0
160.0	194	208	213	213	209	201	198
162.5	171	181	188	188	186	179	178
165.0	148	157	163	164	162	157	156
167.5	125	133	138	139	138	134	134
170.0	105	111	112	114	114	111	112
172.5	87	90	91	92	91	91	91
175.0	70	72	73	74	73	74	74
177.5	58	58	59	59	59	60	60
180.0	52	52	52	52	52	52	52

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5-DEGREE ZONAL LUMEN SUMMARY

0- 5	0
5- 10	1
10- 15	4
15- 20	8
20- 25	12
25- 30	15
30- 35	18
35- 40	23
40- 45	31
45- 50	41
50- 55	51
55- 60	62
60- 65	73
65- 70	83
70- 75	92
75- 80	99
80- 85	104
85- 90	107
90- 95	109
95-100	110
100-105	109
105-110	109
110-115	108
115-120	106
120-125	103
125-130	98
130-135	92
135-140	84
140-145	74
145-150	62
150-155	49
155-160	36
160-165	24
165-170	13
170-175	6
175-180	1

10-DEGREE ZONAL LUMEN SUMMARY

0- 10	2
0- 20	13
0- 30	40
0- 40	81
0- 50	153
0- 60	265
0- 70	421
0- 80	611
0- 90	822
0-100	1041
0-110	1259
0-120	1473
0-130	1674
0-140	1849
0-150	1985
0-160	2070
0-170	2107
0-180	2115

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COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

EFFECTIVE FLOOR CAVITY REFLECTANCE 0.20

RC	80				70				50			30			10			0
RW	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0
0	91	91	91	91	83	83	83	83	67	67	67	53	53	53	40	40	40	34
1	79	73	68	64	71	66	62	58	52	49	46	40	37	35	28	27	25	19
2	70	62	54	49	63	55	49	44	43	39	35	33	29	26	23	20	18	13
3	63	53	45	38	56	47	40	35	37	32	27	27	24	20	19	16	13	9
4	57	46	38	31	51	41	34	28	32	27	22	24	20	16	16	13	10	7
5	52	40	32	26	46	36	29	23	28	23	18	21	17	13	14	11	8	5
6	47	36	28	22	42	32	25	20	25	19	15	18	14	11	12	9	7	4
7	44	32	24	19	39	29	22	17	22	17	13	17	13	9	11	8	6	3
8	40	29	21	16	36	26	19	15	20	15	11	15	11	8	10	7	5	3
9	37	26	19	14	33	23	17	13	18	13	10	14	10	7	9	6	4	2
10	35	24	17	12	31	21	15	11	17	12	9	13	9	6	9	6	4	2

ALL CANDELA, LUMENS, LUMINANCE, COEFFICIENT OF UTILIZATION AND VCP VALUES IN THIS REPORT ARE BASED ON RELATIVE PHOTOMETRY WHICH ASSUMES A BALLAST FACTOR OF 1.000. ANY CALCULATIONS PREPARED FROM THESE DATA SHOULD INCLUDE AN APPROPRIATE BALLAST FACTOR.

NOTE: THE ZONAL CAVITY CALCULATION TECHNIQUE IS ACCURATE WHEN LUMINAIRES WITH SYMMETRIC CANDELA DISTRIBUTIONS ARE EMPLOYED AND WHEN THE LUMINAIRES ARE LOCATED SYMMETRICALLY THROUGHOUT THE ROOM. THIS UNIT HAS SPECIAL CHARACTERISTICS AND THEREFORE THESE COEFFICIENTS SHOULD BE USED WITH CAUTION.

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*** IMPORTANT ***

The compact fluorescent lamps of the type used in this report require special attention in photometry and luminaire application. Specifically, the lamps generate lower flux output when operated in the horizontal or vertical base-down position than when operated in the vertical base-up position. Unfortunately, at the time of this report, only the vertical base-up flux output (lumens) is available from lamp manufacturers.

It is critical to note that, all else equal, a horizontal or base-down lamp calibration will yield higher luminaire candela and efficiency than a base-up lamp calibration. However, for a report which was generated using a horizontal or base-down lamp calibration, any application calculations should use the actual flux output (lumens) for the orientation of the lamp in the luminaire -- at this time, only the base-up lumen rating is available. For a report which was generated using a vertical lamp calibration, the flux output from a vertical lamp should be used. The published lamp lumen figure given on this report is for a vertical base-up lamp. The lamp calibration for this report was performed with the lamp in the same orientation as when the lamp is in the luminaire.

Explanation of the Importance of Ballast Factor

This test was performed using standard relative photometric practices in accordance with recommendations of the Illuminating Engineering Society of North America. Fluorescent testing using the guidelines of relative photometric practice presupposes that the lamps will be operated at their nominal electrical characteristics (e.g., a 40 watt lamp will operate very nearly at 40 watts, and at the voltage and current required for 40-watt operation). When suspended in 25 degree C free air (i.e., not in the luminaire) and operated at these nominal electrical characteristics, the lamps will operate at or very near the optimum point of the flux vs. bulb wall temperature curve. A critical step in relative photometric testing involves measurement of the total flux output from the lamp(s) suspended in free air at 25 degree C ambient temperature. This measurement process is a separate step from the photometric exploration of the luminaire itself. This "bare lamp" measurement is made with the lamp(s) operated by the same ballast(s) which are to be used in the luminaire.

When the lamps are not operated at the nominal electrical characteristics, their flux output may be lower than otherwise expected. As a result, the measurement of the "bare lamp" total flux output is lower than it would be if they were operated at the nominal electrical characteristics. When this "bare lamp" measurement is incorporated into the luminaire test report, the net effect is that the candela values on the luminaire test report are higher than what the luminaire actually produced.

On this particular test, the ballast-lamp combination involved produced significantly less than rated lumens. Since the bare lamp lumen output is low, the suspicion is strong that the lamps are not operated near their specified characteristics.

BOTTOM LINE: It is essential that any calculations involving the data shown in this report use an appropriate ballast factor and, if necessary, an appropriate ballast-lamp photometric factor.

LMPBAL.DIS