



REPORT NUMBER: ITL85704
ISSUE DATE: 10/01/15
PREPARED FOR: BOYD LIGHTING COMPANY
CATALOG NUMBER: C-10531

LUMINAIRE: FABRICATED SEMI-DIFFUSE METAL HOUSING, FABRICATED DIFFUSE METAL CIRCUIT BOARD MOUNT, 3 WHITE CIRCUIT BOARDS EACH WITH 12 LEDS, TRANSLUCENT WHITE FROSTED PLASTIC DIFFUSER WITH TRANSLUCENT WHITE FROSTED TOP AND BOTTOM END CAPS. DIFFUSER FROSTED BOTH SIDES, END CAPS FROSTED SIDE OUT.

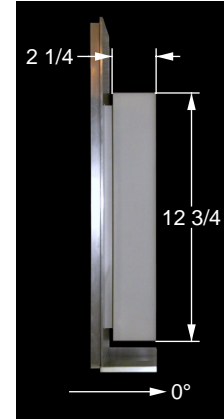
LAMPS: THIRTY-SIX WHITE LIGHT EMITTING DIODES (LEDs), AIMED AT THE HORIZON. 24 LEDS CANTED 13-DEGREES FROM STRAIGHT AHEAD.

INPUT ELECTRICAL: 120.0 VOLTS, 4.94 WATTS, 0.0434 AMPS
MOUNTING: WALL

LED DRIVER: OSRAM OT30W/PRG1050C/UNV/DIM-1/L, DRIVER HAS MULTIPLE LEADS, ONLY LINE INPUT AND LED OUTPUT LEADS CONNECTED FOR THIS TEST. CLIENT STATES DRIVER PROGRAMMED FOR 180mA OUTPUT.

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

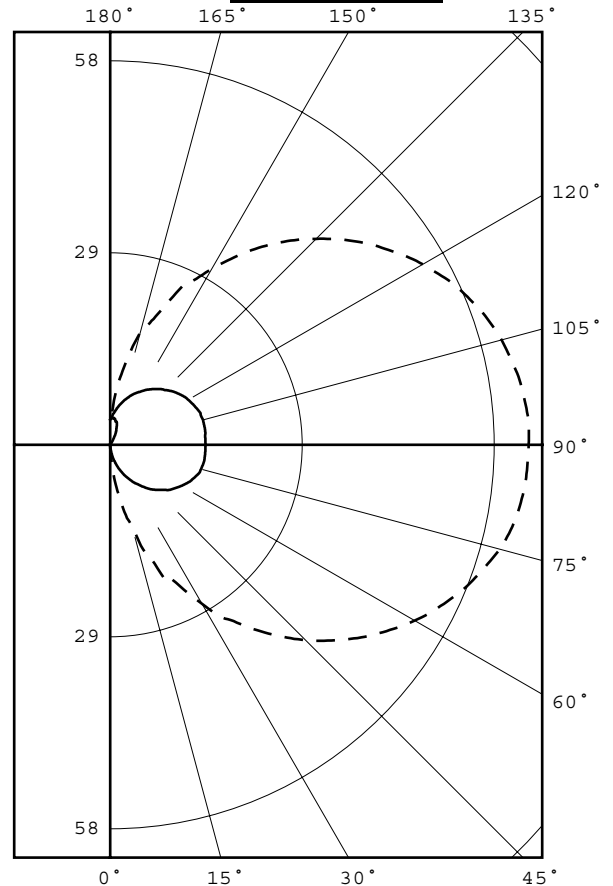
TEST PROCEDURE: IESNA LM-79-08
TEST DISTANCE = 20.0 FEET



CANDELA DISTRIBUTION

	0.0	45.0	90.0	135.0	180.0	
0	0.0	0.0	0.0	0.0	0.0	0
5	3.0	2.0	0.5	0.2	0.0	2
15	12.7	10.6	2.6	1.5	0.0	5
25	22.6	18.4	5.0	3.0	0.0	9
35	32.5	26.3	7.3	4.5	0.0	14
45	41.7	33.7	9.6	5.7	0.0	19
55	49.6	39.8	11.6	6.9	0.0	24
65	56.1	44.6	13.2	7.8	0.0	27
75	60.9	47.9	14.2	8.3	0.0	29
85	63.0	49.3	14.4	8.5	0.0	29
90	63.2	49.4	14.4	8.4	0.0	29
95	63.1	49.4	14.4	8.4	0.0	28
105	61.2	48.2	14.5	8.4	0.0	25
115	57.3	45.4	14.0	8.0	0.0	20
125	51.3	41.2	13.1	7.5	0.0	15
135	44.0	35.8	11.7	6.7	0.0	10
145	35.4	29.0	10.2	6.4	0.0	6
155	26.9	22.4	8.5	6.2	2.0	3
165	17.6	14.4	6.5	5.5	3.6	1
175	6.7	5.9	4.6	4.5	4.1	
180	3.8	3.8	3.8	3.8	3.8	

FLUX



LEGEND:
0-deg - - - - -
90-deg = = = = =
180-deg - - - - -

ZONAL LUMEN SUMMARY

ZONE	LUMENS	%FIXT
0- 30	6	2.4
0- 40	15	5.8
0- 60	48	18.3
0- 90	129	48.6
90-120	81	30.7
90-130	101	38.3
90-150	127	47.9
90-180	136	51.4
0-180	265	100.0

EFFICACY = 53.6 lm/W
CIE TYPE - GENERAL DIFFUSE

Checked B. HYRE
Approved R. BEATTIE
Lighting Engineer



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INDEPENDENT TESTING LABORATORIES, INC.
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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	112.5	135.0	157.5
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2.5	0.9	0.8	0.8	0.7	0.6	0.4	0.3	0.2	0.1	0.1	0.0	0.0	0.0	0.0
5.0	3.0	2.9	2.8	2.6	2.3	2.0	1.6	1.1	0.7	0.5	0.5	0.4	0.2	0.0
7.5	5.6	5.6	5.3	5.2	4.5	3.9	3.2	2.4	1.6	1.1	1.0	0.8	0.5	0.1
10.0	8.0	8.3	7.9	7.7	7.1	6.4	4.9	3.8	2.6	1.7	1.5	1.3	0.9	0.2
12.5	10.9	10.8	11.1	10.1	9.9	8.5	7.0	5.2	3.6	2.3	2.1	1.9	1.2	0.4
15.0	12.7	12.9	13.4	12.8	11.8	10.6	8.9	6.7	4.7	3.0	2.6	2.3	1.5	0.5
17.5	16.6	16.7	16.0	15.2	14.1	12.6	10.5	8.2	5.8	3.7	3.2	2.8	1.9	0.7
20.0	18.5	18.6	17.5	17.2	16.6	14.5	12.4	9.7	6.9	4.3	3.8	3.4	2.3	0.8
22.5	22.4	22.5	20.6	20.4	18.1	17.6	14.0	11.3	8.1	5.0	4.4	3.9	2.6	1.0
25.0	22.6	22.7	22.6	23.4	20.9	18.4	16.4	12.7	9.1	5.8	5.0	4.5	3.0	1.1
27.5	25.1	25.3	25.0	24.3	23.8	21.3	17.9	14.0	10.4	6.5	5.6	5.0	3.3	1.3
30.0	27.7	27.9	28.4	26.7	24.8	23.4	19.2	15.5	11.3	7.3	6.2	5.6	3.7	1.5
32.5	30.7	30.9	30.5	29.2	27.0	24.4	21.4	16.9	12.5	8.0	6.8	6.1	4.1	1.6
35.0	32.5	32.7	32.4	32.0	29.6	26.3	23.0	18.4	13.5	8.6	7.3	6.6	4.5	1.7
37.5	34.9	35.1	34.8	33.7	31.8	28.6	24.5	19.6	14.5	9.4	7.9	7.1	4.8	1.9
40.0	37.2	37.4	37.1	35.9	33.4	30.7	25.8	20.9	15.5	10.1	8.5	7.6	5.1	2.0
42.5	39.5	39.6	39.3	38.1	35.4	32.0	27.4	22.2	16.5	10.8	9.1	8.2	5.5	2.2
45.0	41.7	41.8	41.5	40.2	37.4	33.7	29.2	23.4	17.4	11.4	9.6	8.7	5.7	2.3
47.5	43.8	43.9	43.6	42.2	39.2	35.3	30.4	24.6	18.3	12.1	10.1	9.1	6.1	2.4
50.0	45.8	46.1	45.6	44.0	41.0	36.9	31.6	25.7	19.2	12.7	10.6	9.6	6.3	2.5
52.5	47.8	48.0	47.5	45.9	42.7	38.4	32.9	26.8	20.1	13.3	11.2	10.0	6.6	2.6
55.0	49.6	49.7	49.4	47.6	44.2	39.8	34.1	27.9	20.8	13.9	11.6	10.5	6.9	2.7
57.5	51.4	51.5	51.1	49.3	45.8	41.1	35.3	28.7	21.6	14.4	12.0	10.9	7.2	2.8
60.0	53.1	53.2	52.8	50.7	47.2	42.3	36.4	29.6	22.2	14.9	12.4	11.2	7.5	2.9
62.5	54.7	54.8	54.3	52.1	48.5	43.5	37.3	30.4	22.8	15.3	12.8	11.5	7.7	3.0
65.0	56.1	56.2	55.7	53.5	49.7	44.6	38.2	31.1	23.4	15.7	13.2	11.8	7.8	3.1
67.5	57.5	57.6	57.0	54.7	50.8	45.5	39.1	31.8	24.0	16.1	13.5	12.1	8.0	3.1
70.0	58.7	58.8	58.2	55.9	51.8	46.4	39.8	32.4	24.5	16.5	13.8	12.4	8.1	3.2
72.5	59.8	59.9	59.3	56.9	52.7	47.2	40.5	32.9	24.8	16.8	14.1	12.7	8.2	3.2
75.0	60.9	61.0	60.3	57.7	53.5	47.9	41.1	33.4	25.2	17.0	14.2	12.8	8.3	3.3
77.5	61.7	61.8	61.1	58.5	54.2	48.4	41.5	33.7	25.4	17.2	14.3	12.9	8.4	3.3
80.0	62.3	62.4	61.7	59.0	54.7	48.8	41.9	34.0	25.6	17.3	14.4	12.9	8.4	3.4
82.5	62.7	62.8	62.0	59.4	55.0	49.1	42.1	34.1	25.7	17.3	14.4	12.9	8.4	3.4
85.0	63.0	63.1	62.4	59.6	55.2	49.3	42.2	34.2	25.7	17.3	14.4	12.9	8.5	3.4
87.5	63.1	63.2	62.5	59.8	55.3	49.4	42.3	34.3	25.8	17.3	14.4	12.9	8.4	3.4
90.0	63.2	63.3	62.6	59.8	55.4	49.4	42.4	34.3	25.8	17.3	14.4	12.9	8.4	3.4
92.5	63.3	63.3	62.6	59.9	55.4	49.5	42.3	34.3	25.8	17.3	14.4	12.9	8.4	3.4
95.0	63.1	63.2	62.5	59.8	55.3	49.4	42.3	34.2	25.8	17.4	14.4	13.0	8.4	3.4
97.5	62.8	62.9	62.2	59.5	55.1	49.2	42.2	34.2	25.8	17.4	14.5	13.0	8.5	3.4
100.0	62.4	62.5	61.8	59.1	54.8	48.9	42.0	34.0	25.7	17.4	14.5	13.1	8.4	3.4
102.5	61.8	62.0	61.3	58.7	54.4	48.6	41.7	33.8	25.6	17.3	14.5	13.1	8.4	3.4
105.0	61.2	61.3	60.6	58.1	53.9	48.2	41.4	33.6	25.4	17.3	14.5	13.1	8.4	3.3
107.5	60.4	60.5	59.9	57.4	53.2	47.6	40.9	33.3	25.2	17.2	14.4	13.0	8.3	3.3
110.0	59.5	59.6	59.0	56.5	52.5	47.0	40.4	32.9	24.9	17.0	14.4	12.9	8.2	3.2
112.5	58.4	58.6	58.0	55.6	51.6	46.2	39.8	32.4	24.6	16.8	14.2	12.8	8.1	3.2
115.0	57.3	57.4	56.8	54.5	50.7	45.4	39.1	31.9	24.3	16.6	14.0	12.7	8.0	3.1
117.5	55.9	56.1	55.6	53.3	49.6	44.5	38.3	31.3	23.8	16.3	13.8	12.5	7.9	3.1
120.0	54.5	54.7	54.2	52.0	48.4	43.5	37.5	30.6	23.3	16.0	13.6	12.3	7.8	3.0
122.5	53.0	53.2	52.7	50.7	47.2	42.4	36.5	29.9	22.8	15.6	13.4	12.1	7.6	2.9
125.0	51.3	51.6	51.1	49.2	45.8	41.2	35.6	29.1	22.2	15.2	13.1	11.9	7.5	2.9
127.5	49.7	49.9	49.4	47.6	44.4	40.0	34.5	28.3	21.6	14.8	12.8	11.6	7.3	2.8
130.0	47.9	48.1	47.7	46.0	42.8	38.6	33.4	27.4	20.9	14.4	12.5	11.3	7.1	2.7
132.5	46.0	46.2	45.8	44.2	41.2	37.2	32.2	26.5	20.2	13.9	12.1	11.0	6.9	2.6
135.0	44.0	44.2	43.9	42.4	39.6	35.8	30.9	25.4	19.5	13.4	11.7	10.7	6.7	2.5
137.5	42.0	42.2	41.9	40.5	37.8	34.3	29.7	24.4	18.7	12.9	11.4	10.4	6.5	2.4
140.0	39.9	40.2	39.8	38.5	36.0	32.6	28.3	23.3	17.9	12.4	11.0	10.1	6.4	2.3
142.5	37.7	37.9	37.6	36.5	34.1	30.9	26.8	22.1	17.0	11.9	10.6	9.7	6.4	2.2
145.0	35.4	35.6	35.4	34.3	32.1	29.0	25.2	20.8	16.1	11.3	10.2	9.4	6.4	2.2
147.5	33.0	33.2	33.0	32.1	30.0	27.8	23.7	19.7	15.2	10.7	9.8	9.0	6.4	2.5
150.0	30.7	30.9	30.7	29.8	28.2	25.8	22.3	18.4	14.3	10.1	9.3	8.7	6.4	2.9
152.5	28.3	28.4	28.3	27.7	26.3	23.4	20.9	17.2	13.3	9.6	8.9	8.3	6.2	3.4
155.0	26.9	27.0	26.0	25.8	23.6	22.4	19.2	15.9	12.5	9.0	8.5	8.0	6.2	3.7
157.5	23.7	24.0	23.4	22.7	23.0	19.9	17.8	14.4	11.5	8.4	8.0	7.6	6.1	3.8

THIS REPORT IS BASED ON PUBLISHED INDUSTRY PROCEDURES. FIELD PERFORMANCE MAY DIFFER FROM LABORATORY PERFORMANCE.



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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	112.5	135.0	157.5
160.0	21.0	21.1	21.1	20.8	19.5	18.2	15.9	13.5	10.3	7.8	7.5	7.2	5.9	4.2
162.5	19.0	19.1	19.5	18.0	17.6	16.2	14.4	11.9	9.4	7.2	7.0	6.8	5.7	4.2
165.0	17.6	17.7	16.8	16.1	15.6	14.4	12.6	10.7	8.5	6.7	6.5	6.4	5.5	4.4
167.5	14.7	14.7	14.1	13.8	13.2	12.2	10.8	9.1	7.3	6.0	6.0	6.0	5.4	4.4
170.0	11.8	11.9	12.3	11.5	10.9	10.1	9.0	7.6	6.4	5.5	5.5	5.6	5.1	4.5
172.5	9.4	9.5	9.4	9.3	8.7	8.0	7.0	6.2	5.4	5.0	5.0	5.1	4.8	4.3
175.0	6.7	6.8	6.6	6.5	6.2	5.9	5.4	5.0	4.6	4.5	4.6	4.7	4.5	4.2
177.5	4.5	4.6	4.5	4.5	4.3	4.2	4.1	4.0	4.0	4.0	4.0	4.2	4.2	4.1
180.0	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8



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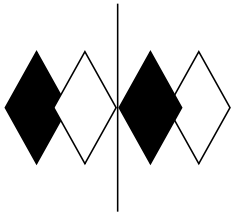
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CANDELA DISTRIBUTION
LATERAL ANGLE

	180.0
0.0	0.0
2.5	0.0
5.0	0.0
7.5	0.0
10.0	0.0
12.5	0.0
15.0	0.0
17.5	0.0
20.0	0.0
22.5	0.0
25.0	0.0
27.5	0.0
30.0	0.0
32.5	0.0
35.0	0.0
37.5	0.0
40.0	0.0
42.5	0.0
45.0	0.0
47.5	0.0
50.0	0.0
52.5	0.0
55.0	0.0
57.5	0.0
60.0	0.0
62.5	0.0
65.0	0.0
67.5	0.0
70.0	0.0
72.5	0.0
75.0	0.0
77.5	0.0
80.0	0.0
82.5	0.0
85.0	0.0
87.5	0.0
90.0	0.0
92.5	0.0
95.0	0.0
97.5	0.0
100.0	0.0
102.5	0.0
105.0	0.0
107.5	0.0
110.0	0.0
112.5	0.0
115.0	0.0
117.5	0.0
120.0	0.0
122.5	0.0
125.0	0.0
127.5	0.0
130.0	0.0
132.5	0.0
135.0	0.0
137.5	0.0
140.0	0.0
142.5	0.0
145.0	0.0
147.5	0.2
150.0	0.8
152.5	1.3
155.0	2.0
157.5	2.4



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CANDELA DISTRIBUTION
 LATERAL ANGLE

	180.0
160.0	2.8
162.5	3.4
165.0	3.6
167.5	3.7
170.0	4.0
172.5	4.0
175.0	4.1
177.5	4.0
180.0	3.8



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5-DEGREE
ZONAL LUMEN SUMMARY

0- 5	0
5- 10	0
10- 15	1
15- 20	1
20- 25	2
25- 30	3
30- 35	4
35- 40	5
40- 45	6
45- 50	8
50- 55	9
55- 60	10
60- 65	11
65- 70	12
70- 75	13
75- 80	14
80- 85	14
85- 90	15
90- 95	15
95-100	14
100-105	14
105-110	14
110-115	13
115-120	12
120-125	11
125-130	9
130-135	8
135-140	7
140-145	6
145-150	5
150-155	3
155-160	3
160-165	2
165-170	1
170-175	0
175-180	0

10-DEGREE
ZONAL LUMEN SUMMARY

0- 10	0
0- 20	2
0- 30	6
0- 40	15
0- 50	29
0- 60	48
0- 70	72
0- 80	100
0- 90	129
0-100	158
0-110	186
0-120	210
0-130	230
0-140	245
0-150	256
0-160	262
0-170	264
0-180	265



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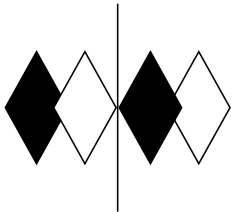
COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

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	107	107	107	107	98	98	98	98	83	83	83	68	68	68	55	55	55	49
1	92	85	79	74	84	78	72	68	64	60	56	51	48	45	40	37	35	29
2	81	71	63	56	74	65	57	51	53	47	42	42	37	33	32	28	25	20
3	73	61	51	44	66	55	47	40	45	38	33	35	30	26	26	22	19	15
4	66	53	43	35	59	48	39	32	39	32	26	30	25	21	22	18	15	11
5	60	46	36	29	54	42	33	27	34	27	22	26	21	17	20	15	12	8
6	55	41	31	24	49	37	28	22	30	23	18	23	18	14	17	13	10	7
7	50	36	27	21	45	33	25	19	27	20	15	21	16	12	16	11	8	5
8	46	33	24	18	42	30	22	16	24	18	13	19	14	10	14	10	7	4
9	43	29	21	16	39	27	19	14	22	16	11	17	12	9	13	9	6	4
10	40	27	19	14	36	24	17	12	20	14	10	16	11	8	12	8	5	3

ALL CANDELA, LUMENS, LUMINANCE, AND VCP VALUES IN THIS REPORT ARE BASED ON ABSOLUTE PHOTOMETRY. THE COEFFICIENT OF UTILIZATION VALUES ARE BASED ON THE TOTAL ABSOLUTE LUMEN OUTPUT OF THIS TEST SAMPLE.

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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REPORT NUMBER: ITL85704
ISSUE DATE: 10/01/15
PREPARED FOR: BOYD LIGHTING COMPANY

PAGE: 8 OF 8

ADDRESS: 1455 VAPOR TRAIL
COLORADO SPRINGS, CO 80916

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REPORT NUMBER: ITL85705
ISSUE DATE: 10/05/15
PREPARED FOR: BOYD LIGHTING COMPANY
CATALOG NUMBER: C-10531

PAGE: 1 OF 8

LUMINAIRE: FABRICATED SEMI-DIFFUSE METAL HOUSING, FABRICATED DIFFUSE METAL CIRCUIT BOARD MOUNT, 3 WHITE CIRCUIT BOARDS EACH WITH 12 LEDS, TRANSLUCENT WHITE FROSTED PLASTIC DIFFUSER WITH TRANSLUCENT WHITE FROSTED TOP AND BOTTOM END CAPS. DIFFUSER FROSTED BOTH SIDES, END CAPS FROSTED SIDE OUT.

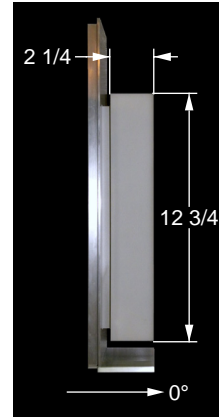
LAMPS: THIRTY-SIX WHITE LIGHT EMITTING DIODES (LEDs), AIMED AT THE HORIZON. 24 LEDS CANTED 13-DEGREES FROM STRAIGHT AHEAD.

INPUT ELECTRICAL: 120.0 VOLTS, 39.6 WATTS, 0.331 AMPS
MOUNTING: WALL

LED DRIVER: OSRAM OT48W/PRG2000C/UNV/DIM-1/L-AUX, DRIVER HAS MULTIPLE LEADS, ONLY LINE INPUT AND LED OUTPUT LEADS CONNECTED FOR THIS TEST. CLIENT STATES DRIVER PROGRAMMED FOR 1800mA OUTPUT.

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

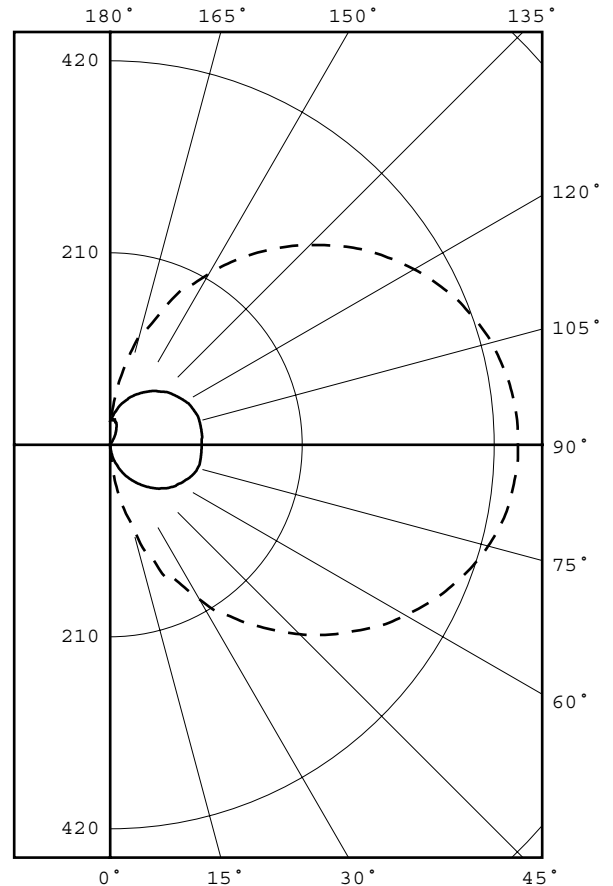
TEST PROCEDURE: IESNA LM-79-08
TEST DISTANCE = 20.0 FEET



CANDELA DISTRIBUTION

	0.0	45.0	90.0	135.0	180.0	FLUX
0	0	0	0	0	0	0
5	21	13	3	1	0	1
15	89	72	19	11	0	11
25	158	128	35	21	0	32
35	229	184	51	31	0	62
45	293	236	67	40	0	98
55	349	279	81	49	0	135
65	395	313	91	55	0	168
75	428	336	99	58	0	192
85	444	348	100	59	0	205
90	446	349	100	59	0	205
95	445	348	101	59	0	205
105	432	340	101	58	0	194
115	403	320	98	56	0	172
125	362	290	91	52	0	142
135	309	251	82	47	0	107
145	249	203	71	45	0	72
155	188	156	59	43	14	42
165	124	102	46	39	25	19
175	47	41	31	31	28	4
180	26	26	26	26	26	0

FLUX



LEGEND:
0-deg -----
90-deg =====
180-deg -----

ZONAL LUMEN SUMMARY

ZONE	LUMENS	% FIXT
0- 30	45	2.4
0- 40	107	5.7
0- 60	339	18.2
0- 90	904	48.6
90-120	572	30.7
90-130	714	38.4
90-150	892	47.9
90-180	956	51.4
0-180	1860	100.0

EFFICACY = 47.0 lm/W
CIE TYPE - GENERAL DIFFUSE

Checked B. HYRE
Approved R. BEATTIE
Lighting Engineer



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REPORT NUMBER: ITL85705

PAGE: 2 OF 8

ISSUE DATE: 10/05/15

PREPARED FOR: BOYD LIGHTING COMPANY

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	112.5	135.0	157.5
0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.5	5	5	5	4	4	3	2	1	0	0	0	0	0	0
5.0	21	20	20	18	16	13	10	7	5	4	3	3	1	0
7.5	39	36	37	35	32	26	22	16	11	8	7	6	4	1
10.0	58	54	55	51	50	41	34	26	17	12	11	10	6	2
12.5	74	77	77	68	68	58	49	36	24	16	15	13	8	3
15.0	89	89	94	87	85	72	60	46	32	20	19	17	11	4
17.5	118	117	113	107	99	87	73	56	40	25	22	20	13	5
20.0	128	128	123	120	116	101	85	67	47	30	26	24	16	6
22.5	156	155	144	143	126	123	98	77	56	35	31	28	19	7
25.0	158	159	157	165	148	128	113	88	63	40	35	32	21	8
27.5	176	177	175	170	168	149	124	97	72	45	39	35	23	9
30.0	195	196	199	187	174	163	134	108	79	50	43	39	26	10
32.5	216	217	215	204	189	170	151	118	87	55	47	43	29	11
35.0	229	229	227	225	207	184	160	128	94	60	51	47	31	12
37.5	246	246	244	236	225	200	170	137	101	65	55	50	34	13
40.0	261	262	260	251	234	216	181	146	108	70	59	54	36	14
42.5	277	278	276	266	248	223	192	155	115	75	63	57	38	15
45.0	293	293	291	281	262	236	204	164	122	80	67	61	40	16
47.5	308	308	306	295	275	247	214	172	129	84	71	64	43	17
50.0	322	323	320	309	288	259	222	180	135	89	74	67	45	18
52.5	335	337	334	322	299	269	231	188	141	93	78	71	47	19
55.0	349	350	347	334	312	279	240	195	146	97	81	74	49	19
57.5	362	362	360	346	322	288	248	201	151	100	84	76	50	20
60.0	373	374	371	356	332	297	256	207	156	104	86	79	52	21
62.5	384	385	382	367	341	305	263	213	160	107	89	81	54	21
65.0	395	395	392	376	350	313	269	218	164	110	91	83	55	22
67.5	404	405	401	385	357	319	275	223	168	113	94	85	56	22
70.0	413	413	409	393	365	326	280	227	171	116	96	87	57	22
72.5	421	421	417	400	371	332	285	231	174	118	98	89	58	23
75.0	428	429	424	406	377	336	288	234	176	119	99	90	58	23
77.5	434	435	430	411	381	340	292	237	178	120	100	90	59	23
80.0	439	440	435	417	386	344	295	239	180	121	100	90	59	23
82.5	442	443	438	419	388	346	296	240	180	121	100	90	59	23
85.0	444	445	440	421	390	348	298	240	181	121	100	90	59	24
87.5	446	447	442	423	391	349	298	241	181	121	100	90	59	24
90.0	446	447	441	423	391	349	298	241	181	121	100	90	59	24
92.5	446	447	442	423	391	349	298	241	181	121	100	90	59	24
95.0	445	446	441	422	391	348	298	241	181	121	101	91	59	24
97.5	443	444	439	420	389	347	297	240	180	121	101	91	59	23
100.0	440	441	436	418	387	345	296	239	180	121	101	91	59	23
102.5	436	437	433	414	384	343	294	238	179	121	101	92	59	23
105.0	432	433	428	410	380	340	291	236	178	121	101	91	58	23
107.5	426	427	423	405	376	336	288	234	176	120	101	91	58	23
110.0	419	420	416	399	370	331	284	231	175	119	100	91	57	22
112.5	412	413	409	392	364	326	280	228	173	117	99	90	57	22
115.0	403	404	401	384	357	320	275	224	170	115	98	89	56	22
117.5	394	395	392	376	350	313	270	219	167	113	97	87	55	21
120.0	384	385	382	367	341	306	264	215	163	111	95	86	54	21
122.5	373	374	371	357	332	298	257	209	159	109	93	84	53	20
125.0	362	362	360	346	323	290	250	204	155	106	91	83	52	20
127.5	350	351	348	335	313	281	243	198	151	103	89	81	51	19
130.0	337	338	336	323	302	271	235	192	146	100	87	79	49	19
132.5	323	324	322	310	290	261	226	186	141	97	85	77	48	18
135.0	309	311	309	297	278	251	217	178	136	94	82	75	47	17
137.5	295	296	295	284	266	240	208	171	131	90	79	73	45	17
140.0	280	281	280	270	253	228	199	163	125	86	77	70	45	16
142.5	265	265	265	255	240	216	188	155	119	83	74	68	45	15
145.0	249	249	249	240	225	203	178	146	113	78	71	65	45	15
147.5	233	233	233	224	211	196	166	138	106	74	68	63	45	18
150.0	216	216	216	208	197	182	157	129	100	70	65	60	44	20
152.5	199	199	199	195	183	164	148	120	93	66	62	58	43	23
155.0	188	190	186	181	166	156	135	112	87	62	59	55	43	26
157.5	169	168	165	159	160	141	125	101	80	58	56	53	42	26



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REPORT NUMBER: ITL85705

PAGE: 3 OF 8

ISSUE DATE: 10/05/15

PREPARED FOR: BOYD LIGHTING COMPANY

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	112.5	135.0	157.5
160.0	148	148	148	150	139	128	113	94	72	54	52	50	41	29
162.5	132	134	137	127	126	113	100	83	65	50	49	47	40	29
165.0	124	124	121	113	110	102	88	75	58	46	46	44	39	30
167.5	103	103	101	96	93	87	76	63	51	42	42	41	37	30
170.0	83	83	85	81	76	71	63	53	44	38	38	38	35	31
172.5	66	66	66	65	61	56	49	43	37	34	35	35	33	30
175.0	47	47	46	45	43	41	37	35	32	31	31	32	31	29
177.5	31	32	31	31	30	30	28	28	28	28	28	29	29	28
180.0	26	26	26	26	26	26	26	26	26	26	26	26	26	26



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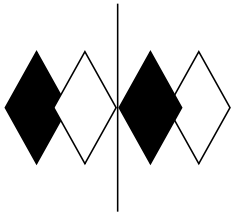
PAGE: 4 OF 8

ISSUE DATE: 10/05/15

PREPARED FOR: BOYD LIGHTING COMPANY

CANDELA DISTRIBUTION
LATERAL ANGLE

	180.0
0.0	0
2.5	0
5.0	0
7.5	0
10.0	0
12.5	0
15.0	0
17.5	0
20.0	0
22.5	0
25.0	0
27.5	0
30.0	0
32.5	0
35.0	0
37.5	0
40.0	0
42.5	0
45.0	0
47.5	0
50.0	0
52.5	0
55.0	0
57.5	0
60.0	0
62.5	0
65.0	0
67.5	0
70.0	0
72.5	0
75.0	0
77.5	0
80.0	0
82.5	0
85.0	0
87.5	0
90.0	0
92.5	0
95.0	0
97.5	0
100.0	0
102.5	0
105.0	0
107.5	0
110.0	0
112.5	0
115.0	0
117.5	0
120.0	0
122.5	0
125.0	0
127.5	0
130.0	0
132.5	0
135.0	0
137.5	0
140.0	0
142.5	0
145.0	0
147.5	2
150.0	6
152.5	10
155.0	14
157.5	17



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PAGE: 5 OF 8

ISSUE DATE: 10/05/15

PREPARED FOR: BOYD LIGHTING COMPANY

CANDELA DISTRIBUTION
 LATERAL ANGLE

	180.0
160.0	20
162.5	23
165.0	25
167.5	26
170.0	28
172.5	27
175.0	28
177.5	28
180.0	26



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REPORT NUMBER: ITL85705

PAGE: 6 OF 8

ISSUE DATE: 10/05/15

PREPARED FOR: BOYD LIGHTING COMPANY

5-DEGREE
ZONAL LUMEN SUMMARY

Table with 2 columns: Zonal Range and Lumen Value. Rows range from 0-5 to 175-180.

10-DEGREE
ZONAL LUMEN SUMMARY

Table with 2 columns: Zonal Range and Lumen Value. Rows range from 0-10 to 0-180.



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PAGE: 7 OF 8

ISSUE DATE: 10/05/15

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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	107	107	107	107	98	98	98	98	83	83	83	68	68	68	55	55	55	49	
1	92	85	79	74	84	78	72	67	64	60	56	51	48	45	40	37	35	29	
2	81	71	63	56	74	65	57	51	53	47	42	42	37	33	32	28	25	20	
3	73	61	51	44	66	55	47	40	45	38	33	35	30	26	26	22	19	14	
4	66	53	43	35	59	48	39	32	39	32	26	30	25	21	22	18	15	11	
5	60	46	36	29	54	42	33	27	34	27	22	26	21	17	19	15	12	8	
6	55	41	31	24	49	37	28	22	30	23	18	23	18	14	17	13	10	7	
7	50	36	27	21	45	33	25	19	27	20	15	21	16	12	15	11	8	5	
8	46	33	24	18	42	30	22	16	24	18	13	19	14	10	14	10	7	4	
9	43	29	21	16	39	27	19	14	22	16	11	17	12	9	13	9	6	4	
10	40	27	19	14	36	24	17	12	20	14	10	16	11	8	12	8	5	3	

ALL CANDELA, LUMENS, LUMINANCE, AND VCP VALUES IN THIS REPORT ARE BASED ON ABSOLUTE PHOTOMETRY. THE COEFFICIENT OF UTILIZATION VALUES ARE BASED ON THE TOTAL ABSOLUTE LUMEN OUTPUT OF THIS TEST SAMPLE.

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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Page 1 of 4

REPORT NUMBER: ITL85708
DATE: 10/08/15
PREPARED FOR: BOYD LIGHTING COMPANY
CATALOG NUMBER: C-10531

ADDRESS: 1455 VAPOR TRAIL
COLORADO SPRINGS, CO 80916

LUMINAIRE: FABRICATED SEMI-DIFFUSE METAL HOUSING, FABRICATED DIFFUSE METAL
CIRCUIT BOARD MOUNT, 3 WHITE CIRCUIT BOARDS EACH WITH 12 LEDS,
TRANSLUCENT WHITE FROSTED PLASTIC DIFFUSER WITH TRANSLUCENT WHITE
FROSTED TOP AND BOTTOM END CAPS. DIFFUSER FROSTED BOTH SIDES, END
CAPS FROSTED SIDE OUT.

LAMP: THIRTY-SIX WHITE LIGHT EMITTING DIODES (LEDS), AIMED AT THE
HORIZON. 24 LEDS CANTED 13-DEGREES FROM STRAIGHT AHEAD.

DRIVER: OSRAM OT30W/PRG1050C/UNV/DIM-1/L, DRIVER HAS MULTIPLE LEADS, ONLY
LINE INPUT AND LED OUTPUT LEADS CONNECTED FOR THIS TEST. CLIENT
STATES DRIVER PROGRAMMED FOR 180mA OUTPUT.

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

INSTRUMENTS: Associated Power Technologies APT5040 AC Power Source Calibration Due: N/A
Yokogawa WT210 Digital Power Meter #6 11/30/15
Ocean Optics QE65000 Spectroradiometer 08/05/16
ITL 2.0m Diameter Integrating Sphere S20-2, 4PI Geometry 08/05/16

OBJECT OF TEST: Measure the Absolute Flux in lumens*, Spectral Power Distribution (SPD),
Correlated Color Temperature (CCT), Color Rendering Index (CRIa,1-14),
Chromaticity Coordinates (x,y; u',v'), ANSI C78.377 Duv, Total Radiant
Flux*, Scotopic / Photopic Lumen Ratio, and electrical data including
ANSI C82.77-2002 Power Factor (PF) and Total Harmonic Distortion (THD)
to the test sample.

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 120VAC input 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.

RESULTS: (continued subsequent pages)

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Checked N WHITE
Approved P O'CONNOR
Sphere Lab Supervisor



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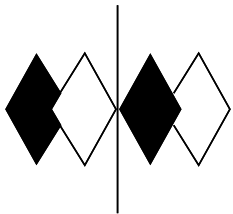
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 REPORT NUMBER: ITL85708
 DATE: 10/08/15
 PREPARED FOR: BOYD LIGHTING COMPANY
 CATALOG NUMBER: C-10531

RESULTS:

PHOTOMETRIC	
Total Integrated Flux (lumens)	265 *
SPECTRORADIOMETRIC	
Observer	CIE 1931 2 degree
Chromaticity Ordinate x	0.4659
Chromaticity Ordinate y	0.4118
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2658
Chromaticity Ordinate v'	0.5287
Correlated Color Temp CCT (K)	2627
ANSI C78.377-2008 Duv	0.000
Total Radiant Flux (milliWatts)	941 *
Scotopic / Photopic Lumen Ratio	1.306
ELECTRICAL	
Input Voltage (Volts AC)	120.0
Input Current (Amps AC)	0.043
Input Power (Watts)	4.93
Input Power Factor (%)	95.5
Input Current THD (%)	8.1
Input Voltage THD (%)	0.1
EFFICACY (lumens/Watt)	53.8

COLOR RENDERING INDICES	CRI
Ra (Average 1-8)	95
R1 Light greyish red	96
R2 Dark greyish yellow	98
R3 Strong yellowish green	97
R4 Moderate yellowish green	97
R5 Light bluish green	97
R6 Light blue	98
R7 Light violet	93
R8 Light reddish purple	83
R9 Strong red	63
R10 Strong yellow	93
R11 Strong green	96
R12 Strong blue	87
R13 Light yellowish pink (skin)	97
R14 Moderate olive green (leaf)	97

*NOTE: The total lumen output shown on this report was obtained from photometric test ITL85704



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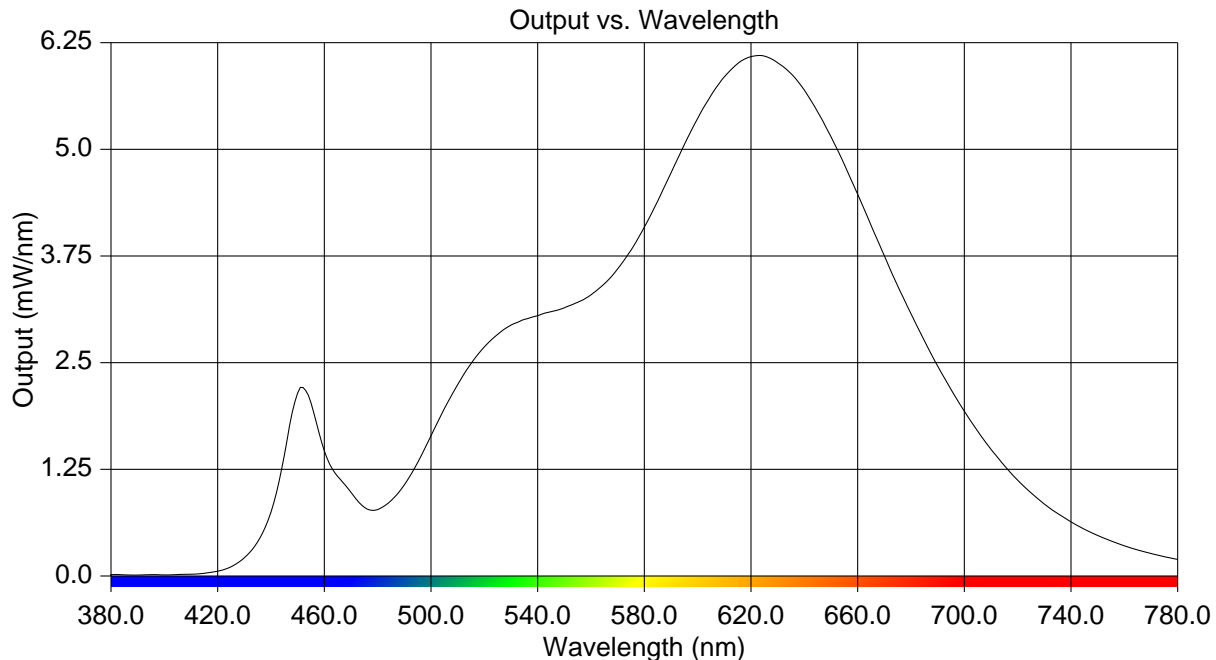


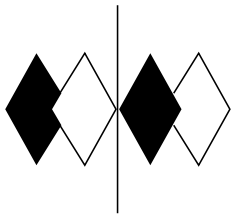
INDEPENDENT TESTING LABORATORIES, INC.
 4066 CAMELOT CIRCLE, LONGMONT, CO 80504 USA

PHONE: (303)442-1255 • FAX: (970)535-3114 • E-MAIL: itl@itlboulder.com • WEBSITE: www.itlboulder.com
 REPORT NUMBER: ITL85708
 DATE: 10/08/15
 PREPARED FOR: BOYD LIGHTING COMPANY
 CATALOG NUMBER: C-10531

RESULTS:

Wavelength	mW per nm	Wavelength	mW per nm	Wavelength	mW per nm
380	0.016	515	2.488	650	5.148
385	0.013	520	2.684	655	4.823
390	0.011	525	2.832	660	4.474
395	0.015	530	2.940	665	4.110
400	0.013	535	3.007	670	3.753
405	0.017	540	3.050	675	3.400
410	0.021	545	3.097	680	3.074
415	0.032	550	3.143	685	2.759
420	0.056	555	3.208	690	2.460
425	0.108	560	3.295	695	2.187
430	0.214	565	3.424	700	1.931
435	0.401	570	3.600	705	1.698
440	0.748	575	3.818	710	1.485
445	1.414	580	4.088	715	1.294
450	2.144	585	4.392	720	1.123
455	2.029	590	4.724	725	0.975
460	1.466	595	5.056	730	0.843
465	1.167	600	5.362	735	0.733
470	0.980	605	5.632	740	0.634
475	0.805	610	5.850	745	0.548
480	0.778	615	6.005	750	0.475
485	0.883	620	6.087	755	0.411
490	1.068	625	6.093	760	0.354
495	1.330	630	6.014	765	0.305
500	1.643	635	5.888	770	0.263
505	1.961	640	5.695	775	0.226
510	2.243	645	5.438	780	0.194





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CIE Chromaticity Diagram

