

itl boulder

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: ITL77371

PAGE: 1 OF 8

ISSUE DATE: 06/04/13

PREPARED FOR: PACE ELECTRONIC PRODUCTS

CATALOG NUMBER: PAC0545W-M

LUMINAIRE: MOLDED WHITE PLASTIC EXTERIOR HOUSING, MOLDED WHITE PLASTIC INTERIOR HOUSING, TWO MOLDED WHITE PLASTIC SWIVEL HEAD ASSEMBLIES, EACH HEAD ASSEMBLY CONSISTS OF: ONE MR-16 INCANDESCENT LAMP, MOLDED WHITE PLASTIC LAMP RETAINING RING. CLEAR PLASTIC EXTERIOR LENS WITH LINEAR PRISMATIC FORWARD CENTER SECTION, LENS PRISMS IN AND PARALLEL WITH LENGTH OF HOUSING. ONLY ONE HEAD ASSEMBLY ENERGIZED FOR THIS TEST.

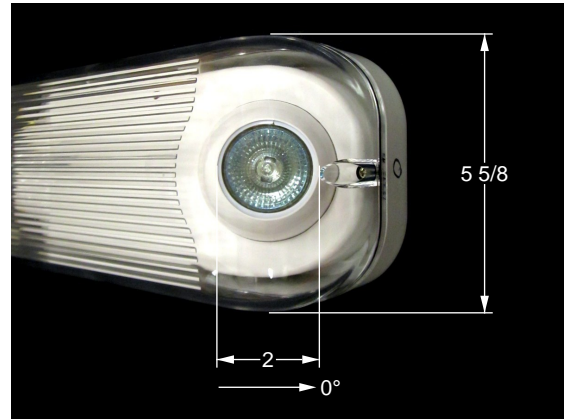
LAMP: ONE 5-WATT MR-16 HALOGEN INCANDESCENT, MANUFACTURER UNKNOWN 6V 5W, VERTICAL BASE-UP POSITION.

TOTAL INPUT WATTS = 4.96 AT 6.0 VOLTS DC

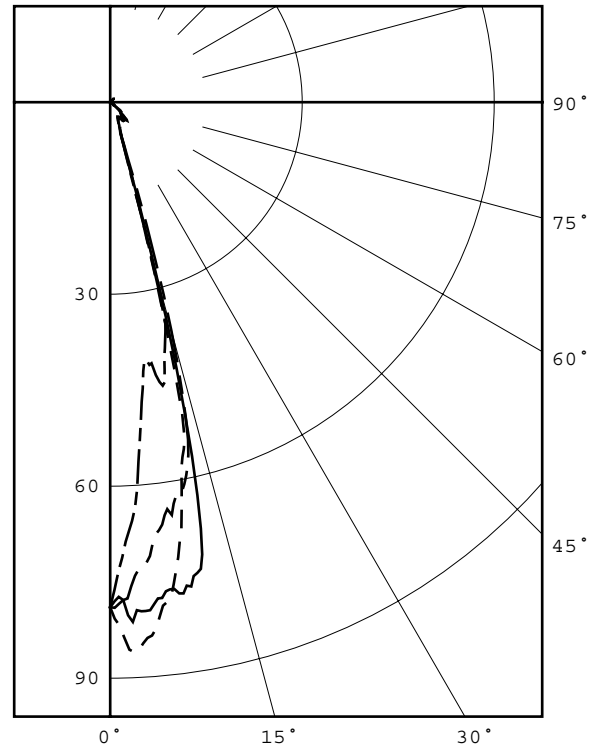
MOUNTING: WALL

NOTE: DATA SHOWN IS ABSOLUTE FOR THE SAMPLE PROVIDED AT CUSTOMER REQUESTED INPUT VOLTAGE (6.0VDC) TO THE LAMP. THE SWIVEL HEAD ASSEMBLY WAS SET IN A CLIENT REQUESTED POSITION WHICH IS APPROXIMATELY AIMED AT THE HORIZON AND CANTED 28-DEGREES FROM STRAIGHT AHEAD WHEN LUMINAIRE IS IN THE VERTICAL AND LEVEL POSITION. FOR THIS TEST THE LUMINAIRE WAS POSITIONED TO PLACE THE LAMP IN THE VERTICAL BASE-UP POSITION (AIMED TOWARDS NADIR).

TEST DISTANCE = 20.0 FEET



CANDELA DISTRIBUTION					FLUX
	0.0	90.0	180.0	270.0	
0	78.9	78.9	78.9	78.9	
5	82.5	78.7	53.0	71.2	6.6
15	21.8	27.6	22.8	36.9	7.4
25	3.1	2.7	3.0	2.9	1.5
35	3.4	3.4	3.6	2.9	1.9
45	1.1	2.4	2.5	2.4	2.0
55	0.6	0.6	0.6	0.7	0.8
65	0.2	0.3	0.3	0.3	0.3
75	0.1	0.1	0.1	0.2	0.1
85	0.1	0.0	0.0	0.1	0.1
90	0.0	0.0	0.0	0.0	
95	0.0	0.0	0.0	0.0	0.0
105	0.0	0.0	0.0	0.0	0.0
115	0.0	0.0	0.0	0.0	0.0
125	0.0	0.1	0.0	0.1	0.0
135	0.0	0.8	0.0	0.2	0.0
145	0.0	0.1	0.0	0.2	0.0
155	0.0	0.0	0.0	0.0	0.0
165	0.0	0.0	0.0	0.0	0.0
175	0.0	0.0	0.0	0.0	0.0
180	0.0	0.0	0.0	0.0	0.0



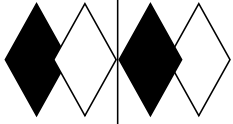
ZONAL LUMEN SUMMARY		
ZONE	LUMENS	% FIXT
0- 30	15.4	74.5
0- 40	17.4	83.8
0- 60	20.2	97.4
0- 90	20.7	99.7
90-120	0.0	0.0
90-130	0.0	0.1
90-150	0.1	0.3
90-180	0.1	0.3
0-180	20.7	100.0

EFFICACY = 4.2 lm/W
CIE TYPE - DIRECT

PLANE	0-DEG	90-DEG	180-DEG
SPACING CRITERIA	0.48	0.50	0.41
BEAM ANGLE (50%)	19.9 X	28.0	DEGREES
FIELD ANGLE (10%)	33.5 X	34.5	DEGREES

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

Checked B. HYRE
 Approved R. BEATTIE
 Lighting Engineer



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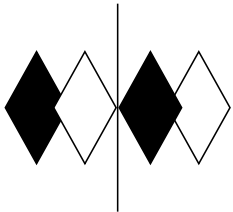
PAGE: 2 OF 8

ISSUE DATE: 06/04/13

PREPARED FOR: PACE ELECTRONIC PRODUCTS

CANDELA DISTRIBUTION LATERAL ANGLE

	0.0	22.5	45.0	67.5	90.0	112.5	135.0	157.5	180.0	202.5	225.0	247.5	270.0	292.5
0.0	78.9	78.9	78.9	78.9	78.9	78.9	78.9	78.9	78.9	78.9	78.9	78.9	78.9	78.9
0.5	80.7	80.7	80.0	79.3	78.0	77.3	76.2	76.2	76.2	76.6	78.1	78.2	79.0	79.4
1.0	81.7	81.7	80.2	78.8	77.3	76.3	74.8	73.7	73.3	73.4	76.0	76.4	78.4	79.2
1.5	83.7	83.4	81.8	80.0	77.8	75.1	73.0	72.7	71.2	71.1	73.4	75.0	77.8	79.8
2.0	85.6	84.9	83.8	82.1	80.2	74.9	71.5	70.9	68.7	69.1	71.9	73.8	77.6	79.3
2.5	86.0	86.0	84.7	83.0	81.3	74.1	70.0	69.1	67.1	67.5	70.1	72.9	75.7	79.4
3.0	85.7	86.5	86.3	83.5	79.5	74.9	69.0	67.4	65.5	66.0	67.8	70.3	74.1	77.7
3.5	84.7	86.6	87.9	83.9	79.7	74.0	67.9	65.0	63.5	64.6	67.3	69.6	73.1	77.9
4.0	83.9	87.3	88.4	84.6	79.7	73.7	66.9	62.5	60.6	62.0	66.4	69.4	72.8	77.3
4.5	83.6	87.3	89.8	84.3	79.6	71.8	66.4	60.4	56.3	59.0	65.4	67.2	72.2	76.5
5.0	82.5	86.7	89.4	84.9	78.7	70.9	64.6	57.8	53.0	57.7	64.1	66.5	71.2	75.7
5.5	80.7	85.3	88.0	85.3	77.9	70.5	62.5	54.4	50.0	53.4	63.7	66.3	69.3	75.5
6.0	79.1	83.9	88.2	84.1	77.9	70.5	60.7	51.1	47.1	52.7	61.3	65.8	67.9	73.2
6.5	78.6	83.6	88.0	84.7	76.9	69.6	58.4	48.4	45.0	47.7	59.1	64.4	67.3	72.2
7.0	78.0	83.8	87.9	85.6	76.7	68.9	56.8	46.2	42.3	46.1	57.9	63.4	66.5	71.4
7.5	76.0	83.6	86.1	85.8	76.7	68.9	56.9	45.4	40.8	44.2	57.4	62.4	65.1	71.2
8.0	73.9	83.3	86.5	85.3	77.5	69.0	57.3	45.7	40.7	43.7	56.6	61.8	64.2	70.5
8.5	71.9	81.1	86.3	84.3	77.6	69.1	58.4	45.0	41.5	42.6	53.6	60.6	65.2	68.8
9.0	69.4	78.5	86.4	84.7	76.5	70.0	58.1	45.6	41.3	42.7	52.9	60.2	63.5	68.3
9.5	67.3	76.3	84.8	86.0	76.7	68.9	56.9	46.4	43.2	43.6	51.5	59.9	62.3	66.7
10.0	64.3	74.3	81.6	84.6	75.2	67.8	54.5	47.3	44.4	44.9	51.1	59.8	62.4	65.7
11.0	58.3	67.2	77.8	81.1	74.3	63.4	49.3	44.5	44.6	44.3	47.7	57.8	60.8	63.3
12.0	55.4	62.0	71.0	74.0	68.1	54.7	44.7	40.5	40.7	41.3	45.5	53.5	58.1	60.4
13.0	50.0	52.8	60.5	63.4	56.8	44.2	38.5	38.3	38.1	38.6	41.8	47.8	54.1	56.1
14.0	35.5	37.5	44.2	48.6	42.9	29.3	26.4	29.3	35.6	36.2	38.2	42.4	46.2	48.7
15.0	21.8	23.4	27.2	29.1	27.6	15.3	15.7	18.5	22.8	24.6	28.7	34.6	36.9	38.7
16.0	13.7	12.9	15.0	13.9	14.6	9.1	9.9	11.0	11.4	12.4	18.5	23.1	25.6	25.2
17.0	8.7	8.5	9.0	8.3	7.7	6.5	7.1	7.5	7.2	7.3	10.1	11.7	13.9	14.0
18.0	6.1	6.1	6.5	6.3	5.5	5.5	5.8	5.6	5.5	5.6	7.3	6.8	6.9	7.6
19.0	4.9	5.0	5.4	5.2	4.7	4.9	4.8	4.7	4.9	5.0	5.8	5.6	5.1	5.2
20.0	4.5	4.5	4.7	4.5	4.3	4.5	4.4	4.4	4.6	4.6	5.1	4.9	4.6	4.6
22.5	3.7	3.7	3.7	3.7	3.3	3.2	3.3	3.3	3.4	3.6	4.0	3.9	3.8	3.6
25.0	3.1	3.0	3.0	2.9	2.7	2.8	2.7	2.8	3.0	3.0	3.1	3.0	2.9	2.8
27.5	2.9	2.8	2.7	2.7	2.5	2.6	2.5	2.6	2.8	2.8	2.9	2.7	2.6	2.7
30.0	2.7	2.7	2.6	3.1	2.8	2.9	2.8	2.6	2.8	2.8	2.8	2.6	2.7	2.6
32.5	2.7	2.8	3.0	3.1	3.0	3.2	3.0	3.2	3.1	3.0	2.9	2.8	2.8	2.9
35.0	3.4	3.2	3.2	3.3	3.4	3.2	3.3	3.3	3.6	3.2	3.3	3.2	2.9	3.1
37.5	3.5	3.2	3.4	3.3	3.2	3.2	3.0	3.0	3.2	3.5	3.2	3.3	2.9	3.5
40.0	2.8	2.9	3.1	3.3	3.1	3.0	2.7	2.6	3.0	3.2	3.3	3.1	3.1	3.2
42.5	2.4	2.5	2.9	2.7	3.7	2.7	2.6	2.3	2.7	2.9	3.1	3.1	3.9	2.7
45.0	1.1	2.4	2.7	2.7	2.4	2.8	2.5	2.3	2.5	2.7	2.8	5.3	2.4	4.5
47.5	0.8	2.5	2.4	4.9	1.8	3.9	2.2	2.4	2.4	2.4	2.8	2.4	2.2	2.4
50.0	0.9	2.3	2.3	1.3	1.1	1.0	2.1	2.0	2.1	2.4	2.3	2.3	1.9	2.0
52.5	1.1	1.8	1.5	0.9	0.8	0.9	0.9	1.0	0.9	1.4	1.3	0.9	0.8	0.9
55.0	0.6	0.8	0.8	1.0	0.6	0.7	0.5	0.5	0.6	0.8	0.8	0.8	0.7	0.9
57.5	0.5	0.6	0.6	0.5	0.4	0.5	0.4	0.4	0.5	0.4	0.6	0.8	0.7	0.6
60.0	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.3	0.4	0.5	0.4
62.5	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.3
65.0	0.2	0.3	0.3	0.2	0.3	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3
67.5	0.2	0.2	0.2	0.3	0.2	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.3	0.2
70.0	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
72.5	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.1	0.2	0.2	0.1	0.2
75.0	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1
77.5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1
80.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
82.5	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.0	0.1	0.1
85.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.0
87.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0
90.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
92.5	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
95.0	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
97.5	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
100.0	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
102.5	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



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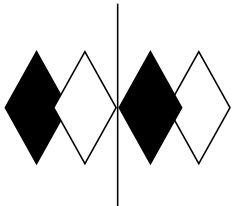
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CANDELA DISTRIBUTION LATERAL ANGLE

	0.0	22.5	45.0	67.5	90.0	112.5	135.0	157.5	180.0	202.5	225.0	247.5	270.0	292.5
105.0	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
107.5	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
110.0	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
112.5	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
115.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
117.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0
120.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0
125.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0
130.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0
135.0	0.0	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0
140.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0
145.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0
150.0	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
155.0	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
160.0	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
165.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
170.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0
175.0	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
180.0	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



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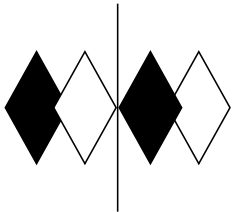
PAGE: 4 OF 8

ISSUE DATE: 06/04/13

PREPARED FOR: PACE ELECTRONIC PRODUCTS

CANDELA DISTRIBUTION
LATERAL ANGLE

	315.0	337.5	360.0
0.0	78.9	78.9	78.9
0.5	80.0	80.2	80.7
1.0	80.3	81.5	81.7
1.5	81.5	82.8	83.7
2.0	82.7	83.1	85.6
2.5	82.2	83.5	86.0
3.0	80.7	82.4	85.7
3.5	80.0	82.3	84.7
4.0	78.5	82.1	83.9
4.5	78.5	81.2	83.6
5.0	76.6	80.4	82.5
5.5	76.9	78.7	80.7
6.0	76.2	76.3	79.1
6.5	74.1	75.0	78.6
7.0	73.0	73.3	78.0
7.5	71.8	72.4	76.0
8.0	70.4	71.0	73.9
8.5	68.1	69.5	71.9
9.0	66.6	68.2	69.4
9.5	66.5	67.9	67.3
10.0	65.7	64.8	64.3
11.0	64.6	59.6	58.3
12.0	60.2	55.0	55.4
13.0	54.4	49.7	50.0
14.0	46.2	41.0	35.5
15.0	33.8	26.8	21.8
16.0	20.0	15.9	13.7
17.0	10.8	9.4	8.7
18.0	6.9	6.4	6.1
19.0	5.2	5.1	4.9
20.0	4.6	4.6	4.5
22.5	3.7	3.6	3.7
25.0	2.8	3.0	3.1
27.5	2.5	2.8	2.9
30.0	2.5	2.6	2.7
32.5	2.7	2.6	2.7
35.0	2.9	2.8	3.4
37.5	3.2	3.0	3.5
40.0	3.2	2.7	2.8
42.5	2.8	2.3	2.4
45.0	2.7	2.2	1.1
47.5	2.5	2.2	0.8
50.0	2.1	2.2	0.9
52.5	1.9	1.7	1.1
55.0	0.8	0.8	0.6
57.5	0.8	0.7	0.5
60.0	0.4	0.4	0.3
62.5	0.3	0.3	0.3
65.0	0.3	0.3	0.2
67.5	0.2	0.2	0.2
70.0	0.2	0.2	0.1
72.5	0.2	0.2	0.2
75.0	0.2	0.1	0.1
77.5	0.1	0.2	0.1
80.0	0.2	0.1	0.1
82.5	0.1	0.1	0.1
85.0	0.1	0.1	0.1
87.5	0.0	0.0	0.0
90.0	0.0	0.0	0.0
92.5	0.0	0.0	0.0
95.0	0.0	0.0	0.0
97.5	0.0	0.0	0.0
100.0	0.0	0.0	0.0
102.5	0.0	0.0	0.0



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REPORT NUMBER: ITL77371

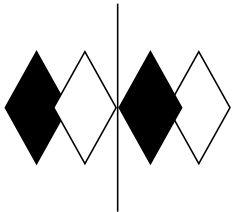
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CANDELA DISTRIBUTION
LATERAL ANGLE

	315.0	337.5	360.0
105.0	0.0	0.0	0.0
107.5	0.0	0.0	0.0
110.0	0.0	0.0	0.0
112.5	0.0	0.0	0.0
115.0	0.0	0.0	0.0
117.5	0.0	0.0	0.0
120.0	0.0	0.0	0.0
125.0	0.0	0.0	0.0
130.0	0.0	0.0	0.0
135.0	0.0	0.0	0.0
140.0	0.0	0.0	0.0
145.0	0.0	0.0	0.0
150.0	0.0	0.0	0.0
155.0	0.0	0.0	0.0
160.0	0.0	0.0	0.0
165.0	0.0	0.0	0.0
170.0	0.0	0.0	0.0
175.0	0.0	0.0	0.0
180.0	0.0	0.0	0.0



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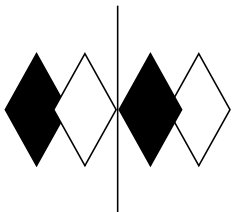
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5-DEGREE ZONAL LUMEN SUMMARY

0- 5	1.8
5- 10	4.8
10- 15	5.8
15- 20	1.6
20- 25	0.8
25- 30	0.7
30- 35	0.9
35- 40	1.1
40- 45	1.1
45- 50	1.0
50- 55	0.5
55- 60	0.3
60- 65	0.2
65- 70	0.1
70- 75	0.1
75- 80	0.1
80- 85	0.0
85- 90	0.0
90- 95	0.0
95-100	0.0
100-105	0.0
105-110	0.0
110-115	0.0
115-120	0.0
120-125	0.0
125-130	0.0
130-135	0.0
135-140	0.0
140-145	0.0
145-150	0.0
150-155	0.0
155-160	0.0
160-165	0.0
165-170	0.0
170-175	0.0
175-180	0.0

10-DEGREE ZONAL LUMEN SUMMARY

0- 10	6.6
0- 20	14.0
0- 30	15.4
0- 40	17.4
0- 50	19.4
0- 60	20.2
0- 70	20.5
0- 80	20.6
0- 90	20.7
0-100	20.7
0-110	20.7
0-120	20.7
0-130	20.7
0-140	20.7
0-150	20.7
0-160	20.7
0-170	20.7
0-180	20.7



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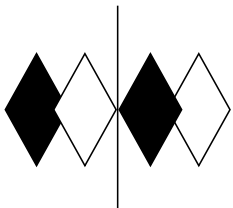
COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

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	119	119	119	119	116	116	116	116	111	111	111	111	106	106	106	102	102	102	100
1	114	111	110	91	107	111	109	107	105	105	103	102	101	100	99	98	97	96	94
2	109	104	101	98	107	103	99	96	99	97	94	96	94	92	94	92	90	89	89
3	104	98	94	90	102	97	93	90	94	91	88	92	89	87	90	87	85	84	84
4	100	93	88	85	98	92	88	84	90	86	83	88	85	82	86	83	81	80	80
5	96	89	84	80	94	88	83	79	86	82	79	84	81	78	83	80	77	76	76
6	92	85	80	76	91	84	79	76	82	78	75	81	77	75	80	77	74	73	73
7	89	81	76	72	88	81	76	72	79	75	72	78	74	71	77	74	71	70	70
8	86	78	73	70	85	78	73	69	76	72	69	76	72	69	75	71	69	67	67
9	83	75	70	67	82	75	70	67	74	70	67	73	69	66	72	69	66	65	65
10	81	73	68	65	80	72	68	65	72	67	64	71	67	64	70	67	64	63	63

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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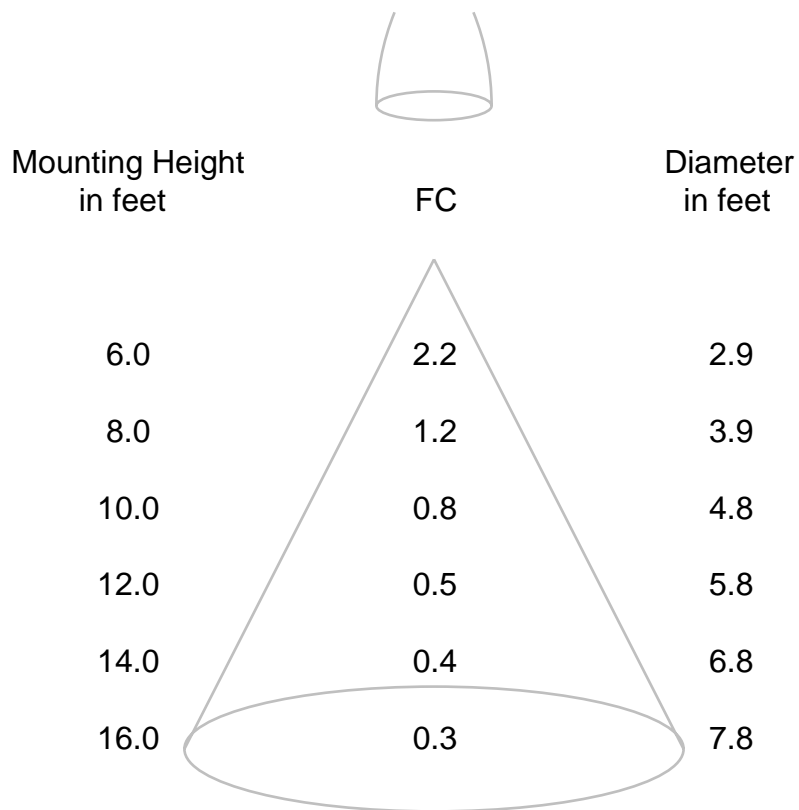
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CONE OF LIGHT DIAGRAM

(diameter shown is where fc value is half the fc at nadir)



Note: The candela values used to generate this diagram were obtained by averaging the photometric data into a single plane.