LTL LUMINAIRE TESTING LABORATORY, INC.

SUSTAINING MEMBER of the IESNA

905 Harrison Street · Allentown, PA 18103 · 610-770-1044 · Fax 610-770-8912 · www.LuminaireTesting.com

LTL NUMBER: 16753 DATE: 09-29-2009
PREPARED FOR: C. CRANE COMPANY, INC.
CATALOG NUMBER: GEOBULB-3 COOL WHITE "A"
LAMP: ONE VBU A19 LED REPLACEMENT LAMP
LED POWER SUPPLY: INTEGRAL
ELECTRICAL VALUES: 120.0VAC, 0.0677A, 6.860W, PF=0.844
NOTE: THIS TEST WAS PERFORMED USING THE CALIBRATED PHOTODETECTOR METHOD OF ABSOLUTE PHOTOMETRY.*

Candela Distribution

	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5	Flux
0	109	109	109	109	109	109	109	109	109	109	109	109	109	109	109	109	
5	109	109	109	109	109	109	109	109	109	109	109	109	109	109	109	109	10.3
15	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	29.7
25	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	45.0
35	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	55.5
45	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	61.6
55	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	63.9
65	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	61.7
75	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	54.9
85	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	45.2
90	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	
95	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	34.3
105	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	23.5
115	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14.3
125	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7.4
135	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3.1
145	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1.1
155	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.4
165	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.2
175	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	

Zonal Lumen Summary

Zone	Lumens	% of Lamp	% of Luminaire
0-30	85.0	N/A	16.6%
0-40	140.5	N/A	27.4%
0-60	266.1	N/A	51.9%
0-90	427.9	N/A	83.5%
90-180	84.4	N/A	16.5%
0-180	512.2	N/A	100.0%

Total lumen Output 512.2 Lumens
Luminaire efficacy: 74.7 Lumens per Watt
CIE Type: Semi-Direct
Spacing Criterion: 1.27

Luminaire

Approved By: MG

*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.

TESTING WAS PERFORMED IN ACCORDANCE WITH IES LM-79-08.
TEST ANGULAR INCREMENTS AND REPORT FORMATTING WAS BASED ON IES LM-41-98 AND LM-46-04.

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Candela Tabulation (5 degree Vertical Increments)

	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5
0	109	109	109	109	109	109	109	109	109	109	109	109	109	109	109	109
5	109	109	109	109	109	109	109	109	109	109	109	109	109	109	109	109
10	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107
15	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105
20	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102
25	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98
30	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93
35	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88
40	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84
45	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80
50	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76
55	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71
60	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67
65	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62
70	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57
75	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52
80	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47
85	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41
90	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36
95	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
100	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27
105	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22
110	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18
115	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14
120	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
125	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
130	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
135	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
140	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
145	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
150	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
155	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
160	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
165	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
170	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
175	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

Zonal Lumen Tabulation (5 degree zones)

Zone	Lumens		Zone	Lumens		Zone	Lumens		Zone	Lumens
0-5	2.6		45-50	31.3		90-95	18.6		135-140	1.2
5-10	7.7		50-55	32.0		95-100	15.7		140-145	0.7
10-15	12.6		55-60	31.9		100-105	13.0		145-150	0.4
15-20	17.1		60-65	31.4		105-110	10.5		150-155	0.3
20-25	20.9		65-70	30.3		110-115	8.2		155-160	0.2
25-30	24.1		70-75	28.5		115-120	6.1		160-165	0.1
30-35	26.7		75-80	26.4		120-125	4.4		165-170	0.1
35-40	28.7		80-85	23.9		125-130	3.0		170-175	0.0
40-45	30.3		85-90	21.3		130-135	1.9		175-180	0.0

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Utilization of Lumens - Zonal Cavity Method												
Effective Floor Cavity Reflectance 20%												
Ceiling Cavity Reflectance	90				80				70			
Wall Reflectance	70	50	30	10	70	50	30	10	70	50	30	10
Room Cavity Ratio (RCR)	** Values are expressed as Lumens delivered to the task surface **											
0	614.4	614.4	614.4	614.4	589.7	589.7	589.7	589.7	566.2	566.2	566.2	566.2
1	543.2	507.2	475.2	446.5	518.3	486	457	430.9	494.8	465.7	439.5	415.8
2	487.8	431.5	385.5	347.2	464.1	413.4	371.5	336.2	441.7	396.1	357.9	325.5
3	441.1	372.8	320.8	279.8	419	357.4	309.7	271.7	398.2	342.6	298.9	263.7
4	401.5	326.5	272.5	231.8	381.2	313.2	263.4	225.4	362.1	300.5	254.6	219.2
5	367.4	289	235.2	196	349	277.6	227.7	190.9	331.6	266.6	220.4	185.9
6	337.9	258.2	205.8	168.6	321.2	248.4	199.5	164.4	305.4	238.9	193.4	160.3
7	312.2	232.6	182.1	147.1	297	224	176.7	143.6	282.6	215.7	171.5	140.1
8	289.6	211	162.6	129.8	275.8	203.5	158	126.8	262.8	196.2	153.6	123.9
9	269.8	192.7	146.5	115.6	257.2	186.1	142.5	113.1	245.4	179.7	138.6	110.6
10	252.2	177	132.9	103.9	240.8	171.1	129.4	101.7	230	165.4	126	99.49

Ceiling Cavity Reflectance	50				30			10			0
Wall Reflectance	70	50	30	10	50	30	10	50	30	10	0
Room Cavity Ratio (RCR)	** Values are expressed as Lumens delivered to the task surface **										
0	522.3	522.3	522.3	522.3	482.1	482.1	482.1	445.2	445.2	445.2	427.9
1	451.1	427.8	406.5	387	392.9	375.8	360	360.7	347.2	334.6	317.1
2	400.3	363.5	332.1	305	333.5	307.9	285.3	305.8	285	266.5	249.7
3	359.9	314.6	278.1	248.1	288.8	258.5	233	264.8	239.9	218.5	202.6
4	327	276.5	237.7	206.9	254.2	221.5	195	233.4	206.1	183.4	168.6
5	299.6	245.9	206.3	176	226.5	192.8	166.4	208.5	179.9	156.9	143.1
6	276.3	220.8	181.5	152.2	204	170.1	144.2	188.2	159.1	136.3	123.4
7	256.2	200	161.4	133.3	185.2	151.6	126.6	171.3	142.2	119.9	107.9
8	238.8	182.4	144.8	118	169.3	136.4	112.3	157.1	128.2	106.7	95.41
9	223.5	167.4	131	105.6	155.8	123.7	100.6	144.9	116.6	95.73	85.22
10	210	154.5	119.4	95.16	144.2	112.9	90.87	134.5	106.7	86.63	76.78

Average Luminance Table (cd/m^2)

	0	45	90
0	34559	34559	34559
45	25129	25129	25129
55	22563	22563	22563
65	19667	19667	19667
75	16419	16419	16419
85	13073	13073	13073

THIS TEST WAS CONDUCTED USING PHOTOMETRY TECHNIQUES ACCORDING TO STANDARD IES PROCEDURES. THE USER MUST THEREFORE USE CAUTION IN THE FOLLOWING SITUATIONS: 1) THIS TEST WAS PERFORMED USING A SPECIFIC BALLAST/LAMP COMBINATION. EXTRAPOLATION OF THESE DATA FOR OTHER BALLAST/LAMP COMBINATIONS MAY PRODUCE ERRONEOUS RESULTS. 2) THIS TEST WAS CONDUCTED IN A CONTROLLED LABORATORY ENVIRONMENT WHERE THE AMBIENT TEMPERATURE WAS HELD AT 25°C ±1°C. FIELD PERFORMANCE MAY DIFFER PARTICULARLY IN REGARDS TO CHANGE IN LUMINOUS OUTPUT AS A RESULT OF DIFFERENCE IN AMBIENT TEMPERATURE AND METHOD OF MOUNTING THE LUMINAIRE.

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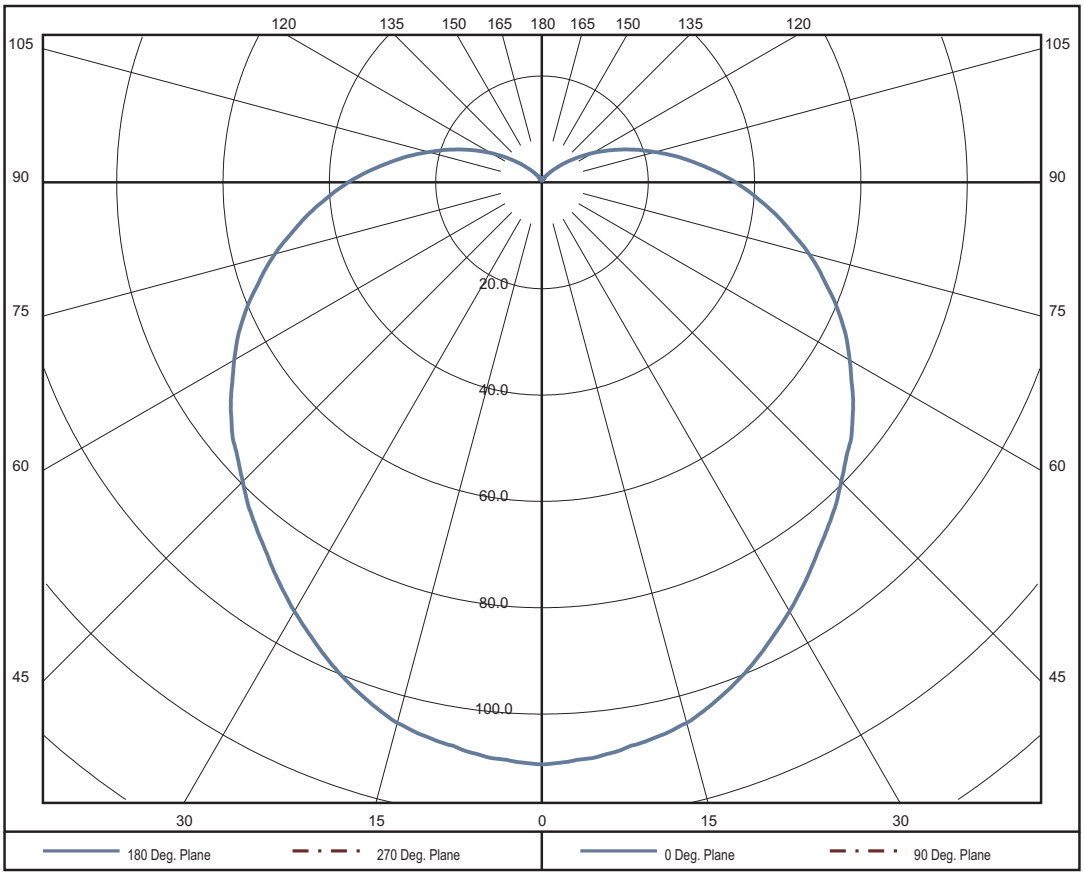

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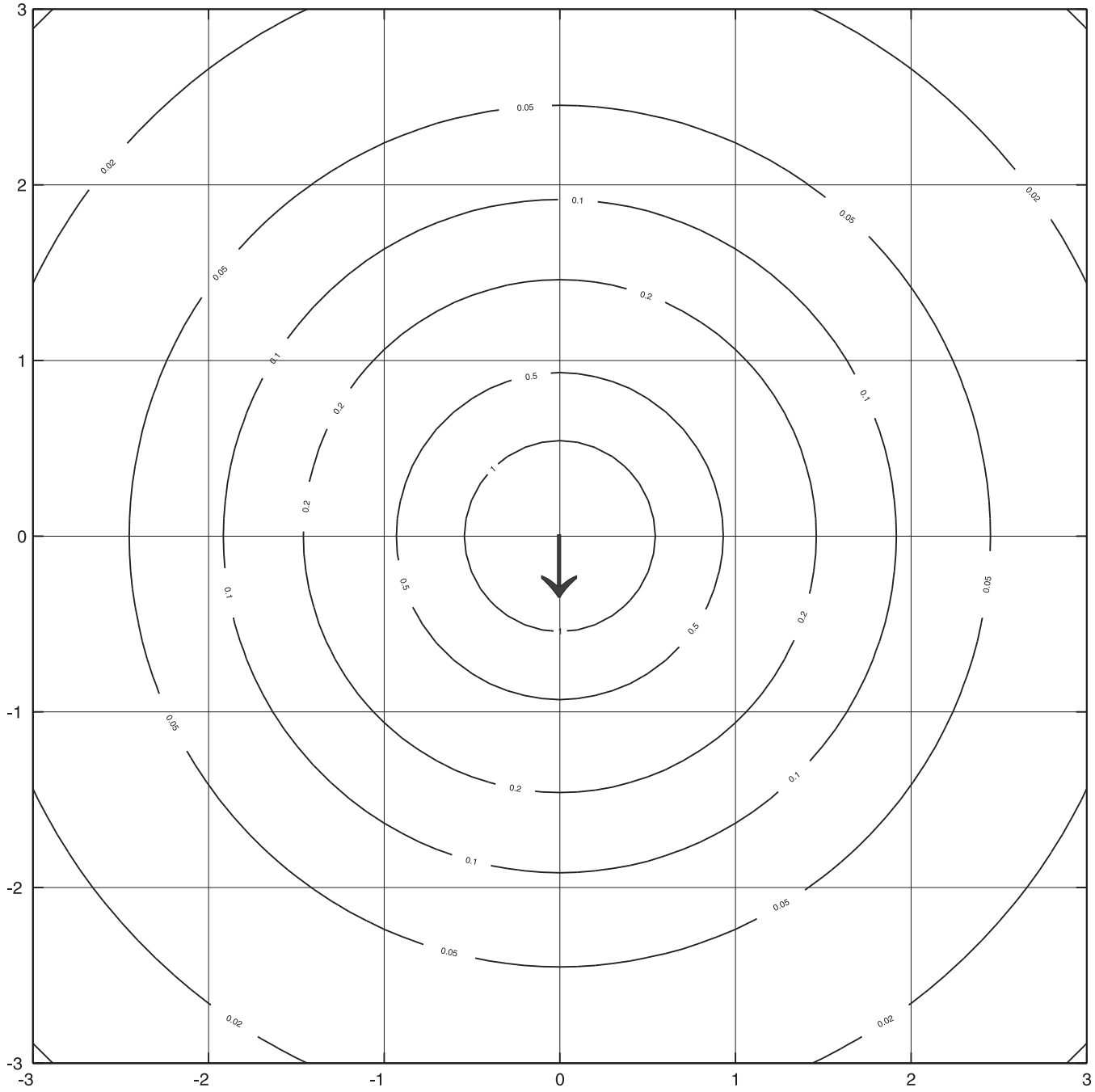
VALUES BASED ON 8.00 FOOT MOUNTING HEIGHT



LTL REPORT NUMBER 16753-ISOFOOTCANDLE VALUES ARE BASED ON A MOUNTING HEIGHT OF 8', WITH THE LUMINAIRE LOCATED AT 0,0. ISOFOOTCANDLE VALUES ARE CALCULATED FROM THE DIRECT CONTRIBUTION FROM THE LUMINAIRE ONLY. WALL, CEILING, AND FLOOR CONTRIBUTION IS NOT INCLUDED.

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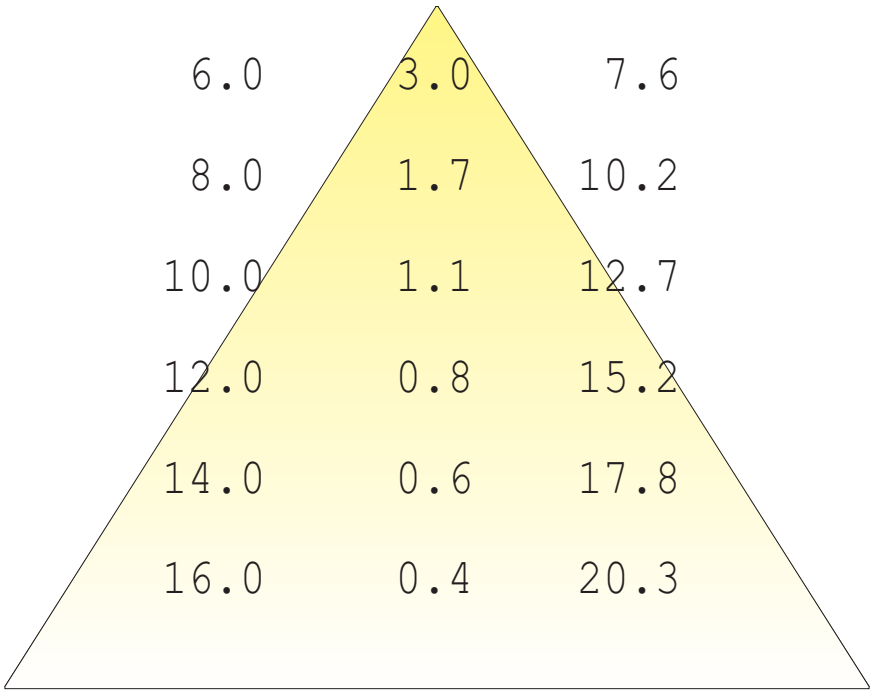
LTL TEST #16753

CIRCLE-OF-LIGHT

Ft below	FC nadir	Dia @ 50%
6.0	3.0	7.6
8.0	1.7	10.2
10.0	1.1	12.7
12.0	0.8	15.2
14.0	0.6	17.8
16.0	0.4	20.3



NOTE: 'Dia' spans the edge-points that are half of nadir FC

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INITIAL ILLUMINATION OF 50 FOOTCANDLES USING LTL TEST NUMBER 16753
LUMINAIRE SUSPENSION LENGTH = 1.5
WORKING PLANE HEIGHT = 2.50
FLOOR REFLECTANCE = 20

ROOM HT		8				9				10				12			
CEIL RF		80		70		80		70		80		70		80		70	
WALL RF		70	50	50	30	70	50	50	30	70	50	50	30	70	50	50	
WIDTH	LENGTH																
10.	10.	14	16	17	20	15	18	19	23	16	21	21	26	19	26	26	
10.	15.	19	22	23	26	20	25	25	30	22	27	28	34	25	33	34	
15.	20.	34	38	40	44	36	41	43	49	38	44	46	53	42	52	54	
15.	30.	49	54	57	62	51	58	61	68	54	62	65	74	59	71	74	
20.	20.	43	48	51	56	46	52	54	60	48	56	58	66	53	63	66	
20.	30.	63	69	71	77	65	73	76	84	68	77	81	90	74	87	90	1
20.	40.	82	89	93	100	85	94	98	108	88	100	104	115	95	111	115	1
20.	60.	120	130	135	144	125	137	142	154	129	144	151	166	138	158	165	1
30.	30.	90	97	101	108	94	103	107	116	97	108	113	124	104	119	124	1
30.	40.	118	126	132	140	122	132	138	148	126	138	144	157	134	151	157	1
30.	50.	146	155	162	171	150	162	169	180	155	169	176	190	164	184	191	2
30.	60.	174	185	192	203	179	192	200	213	183	199	208	223	194	216	226	2
60.	60.	333	346	361	373	340	357	372	388	347	369	384	406	360	388	404	4
60.	80.	440	454	473	487	448	467	486	504	456	480	500	523	471	504	525	5
60.	100.	546	563	586	601	555	576	601	621	564	591	616	642	583	620	647	6
100.	100.	895	915	953	971	906	932	970	994	917	949	988	1018	940	985	1026	10

QUANTITY OF LUMINAIRES