



# 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: 21378 DATE: 11/04/2010  
 PREPARED FOR: RENOVA LIGHTING  
 CATALOG NUMBER: ECS-WVT4-MN-654-UNV-32H-CAL  
 LUMINAIRE: MOLDED PLASTIC AND FORMED STEEL HOUSING, FORMED "MIRO 4"  
 SPECULAR ALUMINUM REFLECTOR, CLEAR ACRYLIC ENCLOSURE WITH  
 CLEAR LINEAR PRISMATIC SIDES AND FROSTED ENDS.  
 LAMP: SIX 54 WATT T5HO LINEAR FLUORESCENT LAMPS RATED AT 4400 LUMENS  
 EACH.  
 LAMP CATALOG NUMBER: PHILIPS F54T5/841/HO/ALTO  
 BALLAST: THREE SYLVANIA "QUICKTRONIC" QHE2X54T5HO/UNV-PSN-HT  
 MOUNTING: PENDANT  
 ELECTRICAL VALUES: 120.0VAC, 2.424A, 290.17W

### Candela Distribution

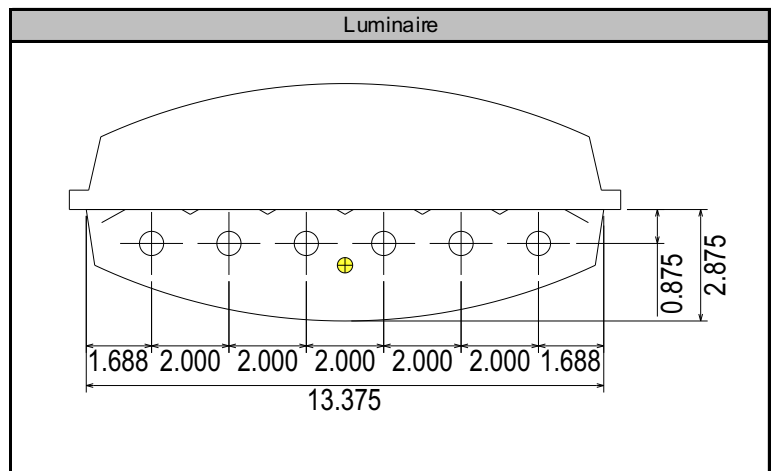
	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5	Flux
0	6159	6159	6159	6159	6159	6159	6159	6159	6159	6159	6159	6159	6159	6159	6159	6159	
5	6124	6129	6173	6203	6216	6203	6173	6129	6124	6129	6173	6203	6216	6203	6173	6129	588.2
15	5888	5998	6017	5852	5778	5852	6017	5998	5888	5998	6017	5852	5778	5852	6017	5998	1662.2
25	5421	5530	5047	4755	4742	4755	5047	5530	5421	5530	5047	4755	4742	4755	5047	5530	2360.3
35	4743	4602	4165	4485	4524	4485	4165	4602	4743	4602	4165	4485	4524	4485	4165	4602	2786.2
45	3878	3442	3699	3446	3412	3446	3699	3442	3878	3442	3699	3446	3412	3446	3699	3442	2737.8
55	2854	2519	2585	2650	2880	2650	2585	2519	2854	2519	2585	2650	2880	2650	2585	2519	2388.8
65	1767	1675	2052	2359	2452	2359	2052	1675	1767	1675	2052	2359	2452	2359	2052	1675	2029.6
75	747	921	1416	1767	1835	1767	1416	921	747	921	1416	1767	1835	1767	1416	921	1412.5
85	149	390	718	970	1057	970	718	390	149	390	718	970	1057	970	718	390	758.0
90	64	293	595	726	755	726	595	293	64	293	595	726	755	726	595	293	
95	65	210	325	417	451	417	325	210	65	210	325	417	451	417	325	210	360.4
105	77	106	180	264	298	264	180	106	77	106	180	264	298	264	180	106	196.1
115	44	81	142	149	155	149	142	81	44	81	142	149	155	149	142	81	119.7
125	21	33	111	162	179	162	111	33	21	33	111	162	179	162	111	33	88.1
135	11	12	46	78	89	78	46	12	11	12	46	78	89	78	46	12	38.1
145	7	7	15	31	37	31	15	7	7	7	15	31	37	31	15	7	12.5
155	0	0	4	10	12	10	4	0	0	0	4	10	12	10	4	0	2.7
165	0	0	2	2	4	2	2	0	0	0	2	2	4	2	2	0	0.5
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	0

### Zonal Lumen Summary

Zone	Lumens	% of Lamp	% of Luminaire
0-30	4610.7	17.5%	26.3%
0-40	7396.9	28.0%	42.2%
0-60	12523.5	47.4%	71.4%
0-90	16723.6	63.3%	95.3%
90-180	818.0	3.1%	4.7%
0-180	17541.6	66.4%	100.0%

Total luminaire efficiency: 66.4%

CIE Type: Direct  
 Spacing Criterion: 0 deg: 1.23    90 deg: 1.14  
 180 deg: 1.23    270 deg: 1.14



Approved By: MG

THIS REPORT BASED ON LM-41 AND OTHER PERTINENT IESNA PROCEDURES.



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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	6159	6159	6159	6159	6159	6159	6159	6159	6159	6159	6159	6159	6159	6159	6159	6159
5	6124	6129	6173	6203	6216	6203	6173	6129	6124	6129	6173	6203	6216	6203	6173	6129
10	6037	6085	6184	6178	6168	6178	6184	6085	6037	6085	6184	6178	6168	6178	6184	6085
15	5888	5998	6017	5852	5778	5852	6017	5998	5888	5998	6017	5852	5778	5852	6017	5998
20	5683	5814	5614	5273	5169	5273	5614	5814	5683	5814	5614	5273	5169	5273	5614	5814
25	5421	5530	5047	4755	4742	4755	5047	5530	5421	5530	5047	4755	4742	4755	5047	5530
30	5109	5127	4504	4588	4681	4588	4504	5127	5109	5127	4504	4588	4681	4588	4504	5127
35	4743	4602	4165	4485	4524	4485	4165	4602	4743	4602	4165	4485	4524	4485	4165	4602
40	4334	4021	4019	4043	3928	4043	4019	4021	4334	4021	4019	4043	3928	4043	4019	4021
45	3878	3442	3699	3446	3412	3446	3699	3442	3878	3442	3699	3446	3412	3446	3699	3442
50	3386	2924	3121	2905	2871	2905	3121	2924	3386	2924	3121	2905	2871	2905	3121	2924
55	2854	2519	2585	2650	2880	2650	2585	2519	2854	2519	2585	2650	2880	2650	2585	2519
60	2318	2171	2093	2711	2858	2711	2093	2171	2318	2171	2093	2711	2858	2711	2093	2171
65	1767	1675	2052	2359	2452	2359	2052	1675	1767	1675	2052	2359	2452	2359	2052	1675
70	1230	1188	1711	2103	2293	2103	1711	1188	1230	1188	1711	2103	2293	2103	1711	1188
75	747	921	1416	1767	1835	1767	1416	921	747	921	1416	1767	1835	1767	1416	921
80	377	639	1055	1282	1346	1282	1055	639	377	639	1055	1282	1346	1282	1055	639
85	149	390	718	970	1057	970	718	390	149	390	718	970	1057	970	718	390
90	64	293	595	726	755	726	595	293	64	293	595	726	755	726	595	293
95	65	210	325	417	451	417	325	210	65	210	325	417	451	417	325	210
100	81	140	243	338	373	338	243	140	81	140	243	338	373	338	243	140
105	77	106	180	264	298	264	180	106	77	106	180	264	298	264	180	106
110	60	95	129	181	209	181	129	95	60	95	129	181	209	181	129	95
115	44	81	142	149	155	149	142	81	44	81	142	149	155	149	142	81
120	30	54	148	167	170	167	148	54	30	54	148	167	170	167	148	54
125	21	33	111	162	179	162	111	33	21	33	111	162	179	162	111	33
130	15	18	72	121	135	121	72	18	15	18	72	121	135	121	72	18
135	11	12	46	78	89	78	46	12	11	12	46	78	89	78	46	12
140	8	10	26	52	64	52	26	10	8	10	26	52	64	52	26	10
145	7	7	15	31	37	31	15	7	7	7	15	31	37	31	15	7
150	0	0	8	19	24	19	8	0	0	0	8	19	24	19	8	0
155	0	0	4	10	12	10	4	0	0	0	4	10	12	10	4	0
160	0	0	4	9	9	9	4	0	0	0	4	9	9	9	4	0
165	0	0	2	2	4	2	2	0	0	0	2	2	4	2	2	0
170	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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	147.3	45-50	1329.0	90-95	216.5	135-140	14.3
5-10	440.9	50-55	1223.0	95-100	143.9	140-145	8.1
10-15	717.1	55-60	1165.7	100-105	113.2	145-150	4.4
15-20	945.1	60-65	1083.3	105-110	82.8	150-155	1.7
20-25	1113.2	65-70	946.3	110-115	62.1	155-160	0.9
25-30	1247.1	70-75	792.4	115-120	57.5	160-165	0.5
30-35	1360.7	75-80	620.1	120-125	51.2	165-170	0.0
35-40	1425.6	80-85	430.6	125-130	36.9	170-175	0.0
40-45	1408.8	85-90	327.4	130-135	23.8	175-180	0.0



Coefficients of Utilization - Zonal Cavity Method												
Effective Floor Cavity Reflectance 20%												
Ceiling Cavity Reflectance	90				80				70			
	70	50	30	10	70	50	30	10	70	50	30	10
Room Cavity Ratio (RCR)												
0	0.807	0.807	0.807	0.807	0.784	0.784	0.784	0.784	0.762	0.762	0.762	0.762
1	0.731	0.692	0.658	0.627	0.708	0.673	0.642	0.614	0.686	0.655	0.627	0.601
2	0.664	0.601	0.549	0.505	0.642	0.585	0.537	0.497	0.622	0.569	0.525	0.488
3	0.606	0.526	0.466	0.418	0.585	0.513	0.457	0.412	0.566	0.5	0.448	0.407
4	0.555	0.466	0.402	0.354	0.536	0.455	0.395	0.35	0.518	0.444	0.388	0.345
5	0.511	0.416	0.352	0.305	0.493	0.407	0.346	0.302	0.477	0.397	0.341	0.298
6	0.472	0.375	0.311	0.266	0.456	0.367	0.307	0.264	0.441	0.359	0.302	0.261
7	0.438	0.34	0.278	0.236	0.423	0.333	0.275	0.234	0.41	0.326	0.271	0.232
8	0.407	0.311	0.251	0.211	0.395	0.304	0.248	0.209	0.382	0.298	0.245	0.207
9	0.381	0.285	0.228	0.19	0.369	0.28	0.225	0.188	0.358	0.275	0.223	0.187
10	0.357	0.263	0.208	0.172	0.346	0.259	0.206	0.171	0.336	0.254	0.204	0.17

Ceiling Cavity Reflectance	50				30			10			0
	70	50	30	10	50	30	10	50	30	10	0
Room Cavity Ratio (RCR)											
0	0.721	0.721	0.721	0.721	0.684	0.684	0.684	0.65	0.65	0.65	0.633
1	0.646	0.621	0.598	0.576	0.589	0.57	0.553	0.56	0.545	0.531	0.515
2	0.583	0.54	0.504	0.472	0.514	0.483	0.457	0.489	0.464	0.442	0.425
3	0.53	0.475	0.431	0.395	0.453	0.416	0.384	0.432	0.401	0.374	0.358
4	0.485	0.423	0.375	0.337	0.404	0.363	0.329	0.386	0.351	0.322	0.306
5	0.447	0.38	0.33	0.292	0.363	0.32	0.286	0.348	0.31	0.28	0.265
6	0.414	0.344	0.294	0.257	0.329	0.286	0.252	0.316	0.278	0.247	0.233
7	0.385	0.313	0.264	0.228	0.301	0.257	0.224	0.289	0.25	0.22	0.207
8	0.36	0.287	0.239	0.204	0.276	0.233	0.201	0.266	0.227	0.198	0.185
9	0.338	0.265	0.218	0.185	0.255	0.213	0.182	0.247	0.208	0.179	0.167
10	0.318	0.245	0.199	0.168	0.237	0.195	0.166	0.229	0.191	0.164	0.152

Average Luminance Table (cd/m<sup>2</sup>)

	0	45	90
0	14338	14338	14338
45	12132	10492	9470
55	10756	8434	9134
65	8709	8174	9406
75	5567	7535	9268
85	2442	6042	8174

THIS TEST WAS CONDUCTED USING RELATIVE PHOTOMETRY TECHNIQUES ACCORDING TO STANDARD IESNA 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) ACCORDING TO IESNA PROCEDURES, THE BALLAST(S) AND LAMP(S) ARE PRESUMED TO PRODUCE 100% OF RATED OUTPUT. AN APPROPRIATE BALLAST FACTOR MUST BE APPLIED TO THE LUMEN OUTPUT RATINGS AND LUMINOUS INTENSITY VALUES GIVEN. 3) 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.

