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NATA

Client:

LumCAT: 1-0926-M

Luminaire: 92.70.127.00

Report No: nt0100

Test No: GC2020011702

LampCAT: LUMINUS CLM-9-AA40

Lamp flux(lm): 1442.0

Number of Lamps: 1

Length(mm): 0

Phm Type: C

Voltage(V): 33.8900

Current(A): 0.3470

Power (W): 11.7800

PF: 0.0000

Ballast type: DC

Width(mm): 0

Height(mm): 0

Photometric Results

Lumens(lm): 1037.14, Efficiency(%): 71.92% , Luminous Efficacy(lm/W): 88.04

Central intensity(cd): 7600.500, Maximum intensity(cd): 7600.500

Angle of maximum intensity: C=0.0 γ =0.0

Beam Angle(50%Imax): [C0/180]Total=17.8

[C90/270]Total=17.8

Field angle(10%Imax): [C0/180]Total=39.0

[C90/270]Total=39.0

Maximum s/h(1/2): C0_180=0.30 C90_270=0.30

Maximum s/h(1/4): C0_180=0.34 C90_270=0.34

Up flux rate of lamp(%): 0.00%

Down flux rate of lamp(%): 71.92%

Up flux rate of LUM(%): - -

Down flux rate of LUM(%): 100.00%

CIE Type : Direct lighting

Output flux ratio in π solid angle : 98.565%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
0.0	7600.500	0.000	0	.000%	.000%
1.0	7504.172	7.227	7.227	.501%	.697%
2.0	7205.344	21.112	28.34	1.464%	2.732%
3.0	6779.742	33.448	61.788	2.320%	5.957%
4.0	6308.367	43.810	105.598	3.038%	10.182%
5.0	5846.625	52.290	157.888	3.626%	15.223%
6.0	5270.766	58.425	216.313	4.052%	20.857%
7.0	4743.984	62.161	278.474	4.311%	26.850%
8.0	4248.633	64.358	342.832	4.463%	33.056%
9.0	3735.844	64.710	407.542	4.488%	39.295%
10.0	3275.719	63.452	470.994	4.400%	45.413%
11.0	2921.625	61.924	532.919	4.294%	51.383%
12.0	2578.711	60.127	593.045	4.170%	57.181%
13.0	2222.578	56.979	650.024	3.951%	62.675%
14.0	1948.359	53.388	703.412	3.702%	67.822%
15.0	1692.422	49.982	753.394	3.466%	72.641%
16.0	1452.867	46.087	799.481	3.196%	77.085%
17.0	1190.784	41.169	840.65	2.855%	81.055%
18.0	1027.181	36.569	877.22	2.536%	84.581%
19.0	846.316	32.595	909.815	2.260%	87.723%
20.0	676.709	27.876	937.69	1.933%	90.411%
21.0	510.103	22.789	960.479	1.580%	92.608%
22.0	371.651	17.719	978.199	1.229%	94.317%
23.0	258.870	13.230	991.429	.917%	95.592%
24.0	140.569	8.733	1000.162	.606%	96.434%
25.0	67.613	4.734	1004.895	.328%	96.891%
26.0	27.042	2.234	1007.13	.155%	97.106%
27.0	14.182	1.009	1008.138	.070%	97.204%
28.0	10.097	0.615	1008.753	.043%	97.263%
29.0	9.035	0.501	1009.254	.035%	97.311%
30.0	8.325	0.469	1009.722	.033%	97.356%
31.0	7.734	0.447	1010.169	.031%	97.399%
32.0	7.270	0.430	1010.599	.030%	97.441%
33.0	6.898	0.417	1011.016	.029%	97.481%
34.0	6.602	0.409	1011.425	.028%	97.520%
35.0	6.321	0.401	1011.826	.028%	97.559%
36.0	6.124	0.396	1012.223	.027%	97.597%
37.0	5.955	0.394	1012.617	.027%	97.635%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
38.0	5.808	0.393	1013.009	.027%	97.673%
39.0	5.667	0.392	1013.401	.027%	97.711%
40.0	5.569	0.392	1013.793	.027%	97.749%
41.0	5.477	0.393	1014.186	.027%	97.787%
42.0	5.400	0.395	1014.581	.027%	97.825%
43.0	5.344	0.398	1014.979	.028%	97.863%
44.0	5.280	0.401	1015.38	.028%	97.902%
45.0	5.231	0.404	1015.784	.028%	97.941%
46.0	5.175	0.407	1016.191	.028%	97.980%
47.0	5.133	0.410	1016.601	.028%	98.020%
48.0	5.098	0.414	1017.015	.029%	98.059%
49.0	5.063	0.417	1017.432	.029%	98.100%
50.0	5.020	0.420	1017.852	.029%	98.140%
51.0	5.006	0.424	1018.277	.029%	98.181%
52.0	4.964	0.428	1018.704	.030%	98.222%
53.0	4.943	0.431	1019.135	.030%	98.264%
54.0	4.929	0.435	1019.57	.030%	98.306%
55.0	4.901	0.439	1020.009	.030%	98.348%
56.0	4.894	0.443	1020.452	.031%	98.391%
57.0	4.873	0.447	1020.898	.031%	98.434%
58.0	4.866	0.450	1021.349	.031%	98.477%
59.0	4.838	0.454	1021.802	.031%	98.521%
60.0	4.830	0.457	1022.259	.032%	98.565%
61.0	4.816	0.460	1022.719	.032%	98.609%
62.0	4.788	0.463	1023.182	.032%	98.654%
63.0	4.788	0.466	1023.648	.032%	98.699%
64.0	4.774	0.469	1024.117	.033%	98.744%
65.0	4.781	0.473	1024.59	.033%	98.790%
66.0	4.760	0.476	1025.066	.033%	98.836%
67.0	4.767	0.479	1025.545	.033%	98.882%
68.0	4.767	0.483	1026.028	.033%	98.928%
69.0	4.746	0.485	1026.514	.034%	98.975%
70.0	4.739	0.487	1027.001	.034%	99.022%
71.0	4.739	0.490	1027.491	.034%	99.069%
72.0	4.725	0.492	1027.983	.034%	99.117%
73.0	4.732	0.495	1028.477	.034%	99.165%
74.0	4.732	0.498	1028.975	.035%	99.213%
75.0	4.725	0.500	1029.474	.035%	99.261%

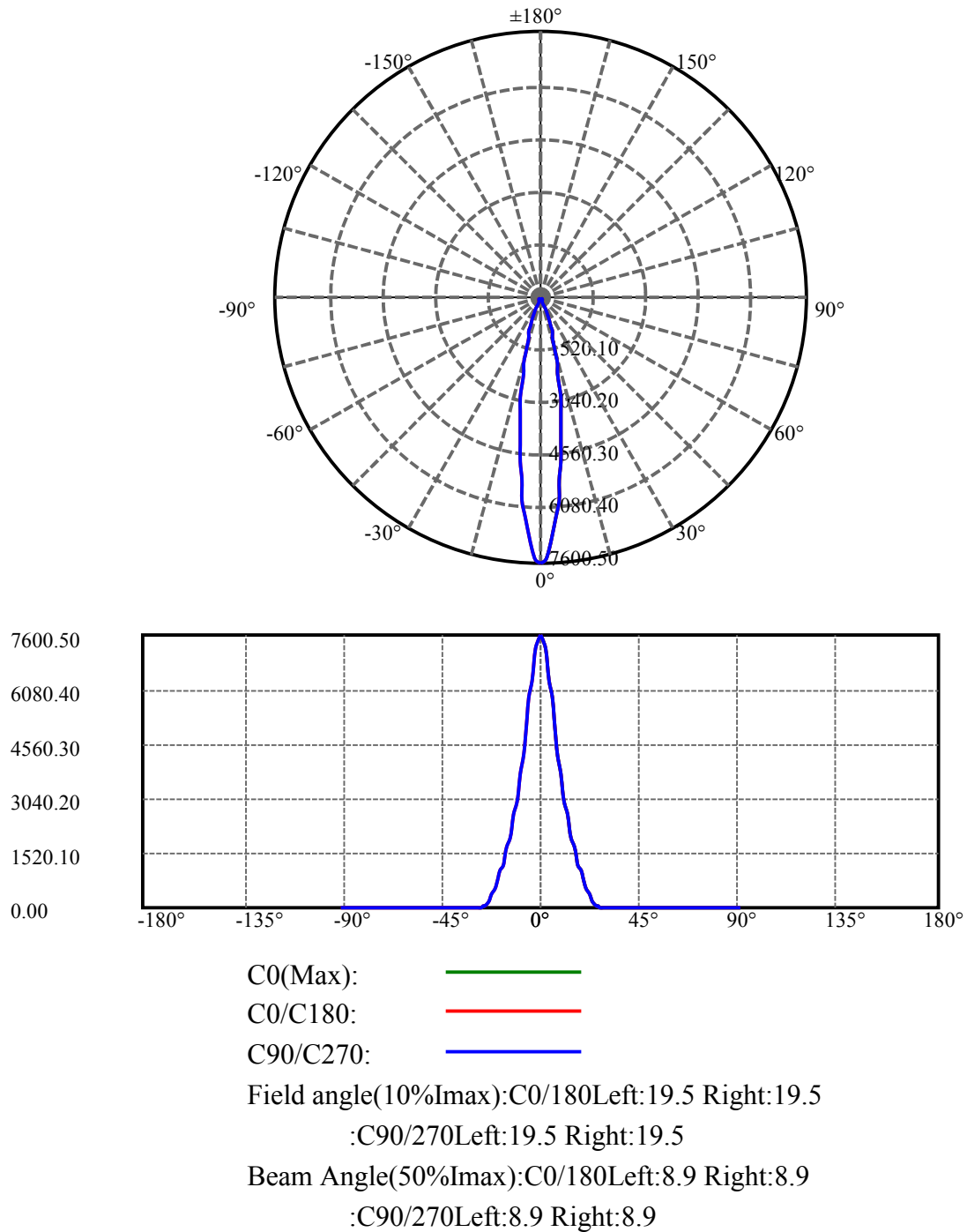
$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
76.0	4.718	0.501	1029.976	.035%	99.309%
77.0	4.718	0.503	1030.479	.035%	99.358%
78.0	4.718	0.505	1030.984	.035%	99.406%
79.0	4.725	0.507	1031.491	.035%	99.455%
80.0	4.704	0.508	1032	.035%	99.504%
81.0	4.711	0.509	1032.509	.035%	99.553%
82.0	4.718	0.511	1033.02	.035%	99.603%
83.0	4.732	0.514	1033.534	.036%	99.652%
84.0	4.732	0.516	1034.049	.036%	99.702%
85.0	4.739	0.517	1034.566	.036%	99.752%
86.0	4.711	0.517	1035.083	.036%	99.802%
87.0	4.704	0.515	1035.598	.036%	99.851%
88.0	4.697	0.515	1036.113	.036%	99.901%
89.0	4.690	0.515	1036.628	.036%	99.950%
90.0	4.683	0.514	1037.141	.036%	100.000%

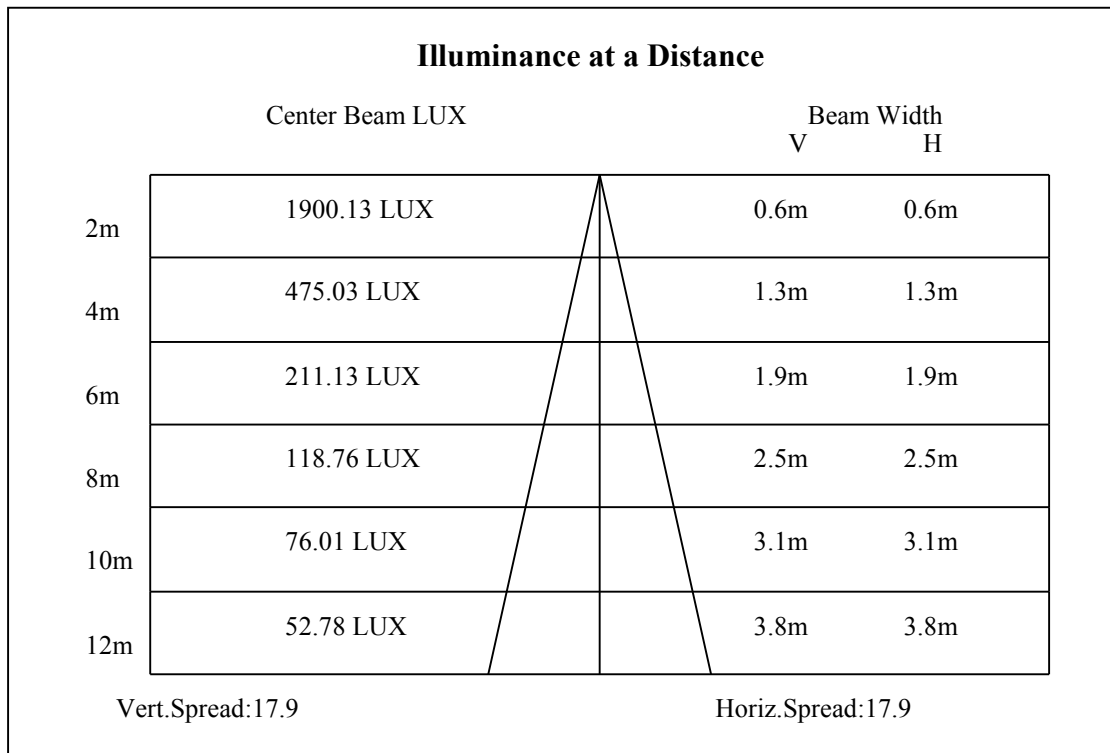
ZONAL LUMEN SUMMARY

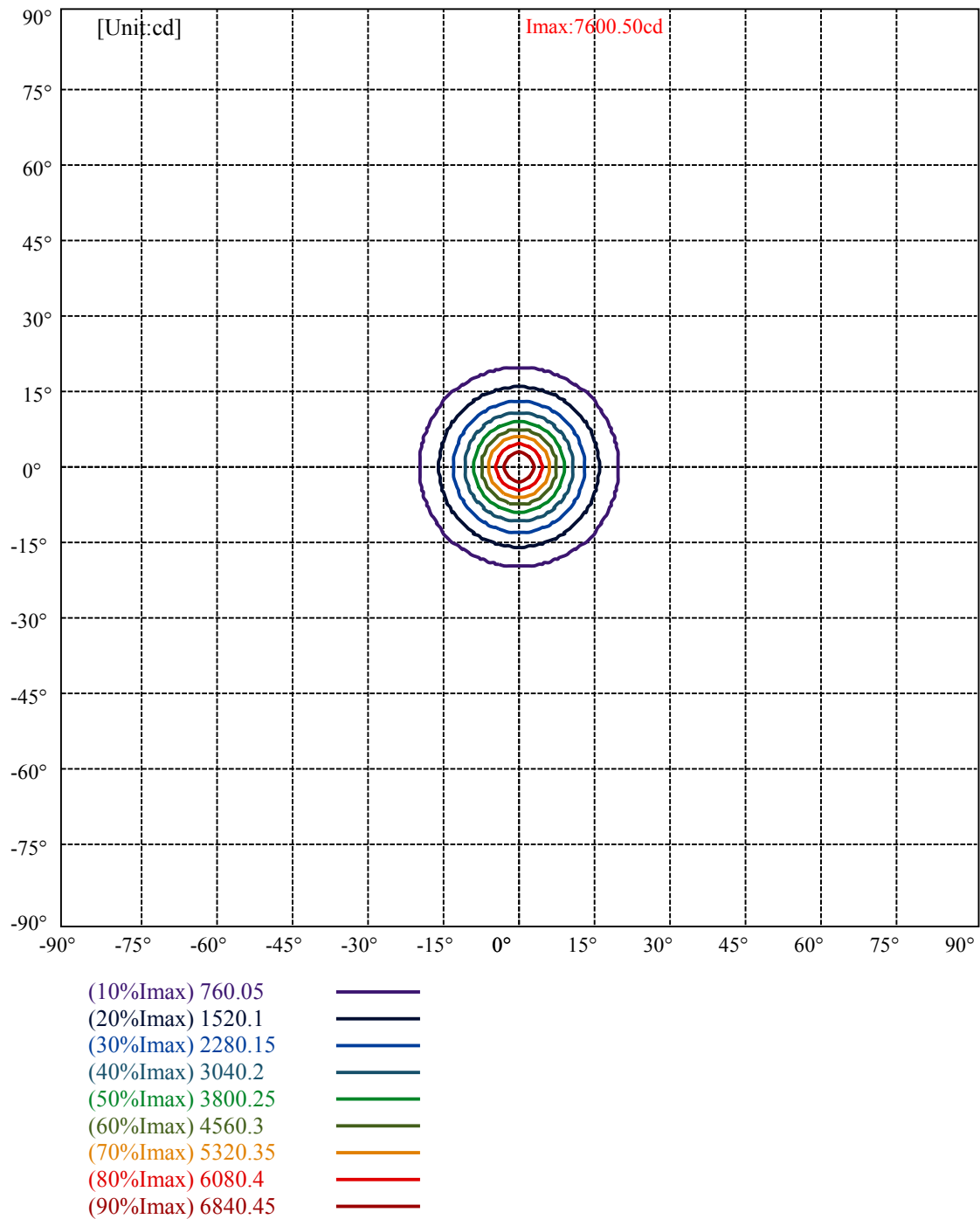
Zone	Lumens	%Lamp	%Fixt
0-30	1009.72	70.02%	97.36%
0-40	1013.79	70.30%	97.75%
0-60	1022.26	70.89%	98.57%
0-90	1036.63	71.89%	99.95%
0-120	1036.63	71.89%	99.95%
0-180	1037.14	71.92%	100.00%
60-90	14.83	1.03%	1.43%
90-120	0.00	0.00%	0.00%
90-130	0.00	0.00%	0.00%
90-150	0.00	0.00%	0.00%
90-180	0.00	0.00%	0.00%
0-16.73	829.71	57.54%	80.00%

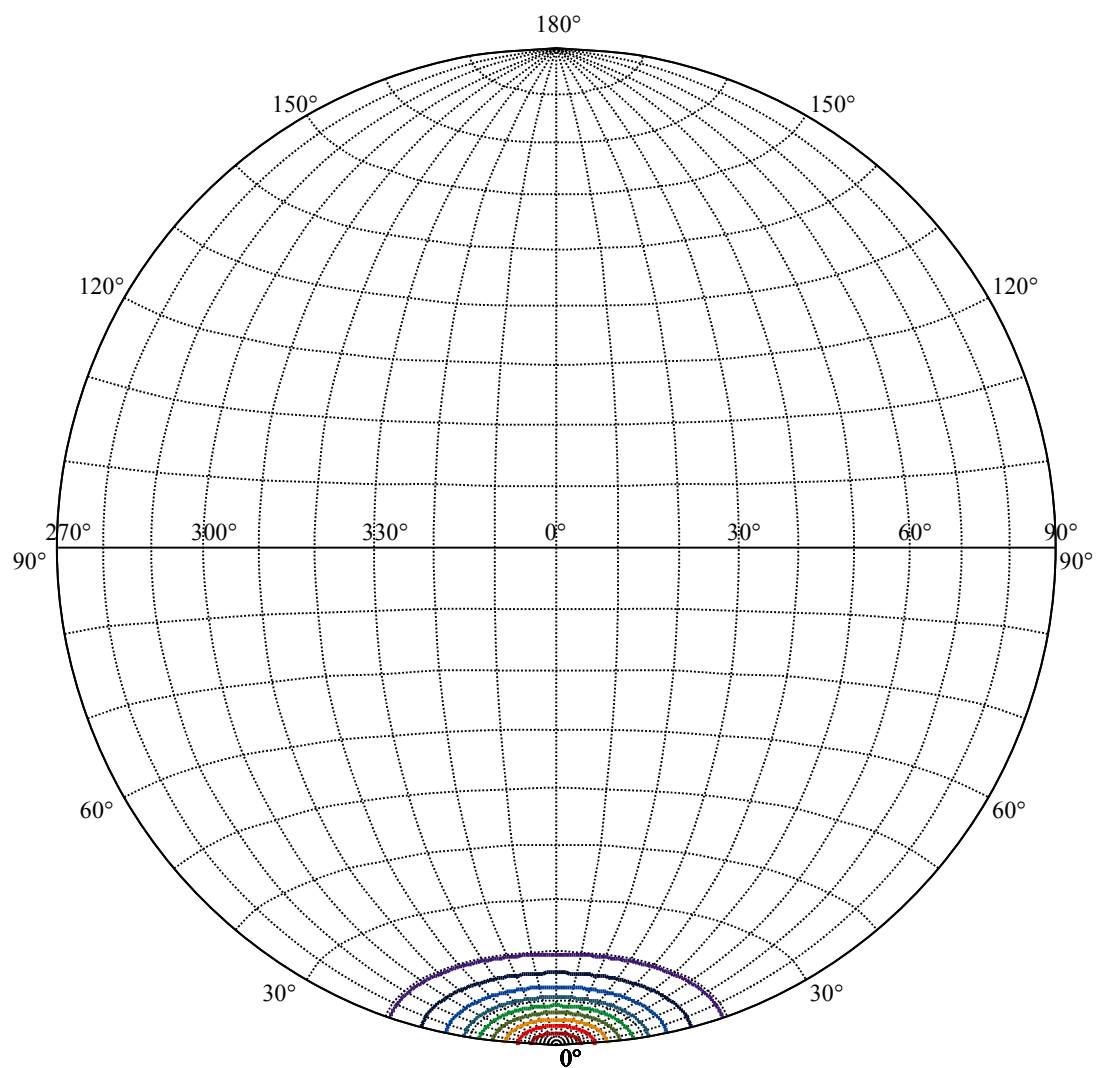
ZONAL LUMEN SUMMARY

0-10	470.99
10-20	466.70
20-30	72.03
30-40	4.07
40-50	4.06
50-60	4.41
60-70	4.74
70-80	5.00
80-90	4.63
90-100	0.00
100-110	0.00
110-120	0.00
120-130	0.00
130-140	0.00
140-150	0.00
150-160	0.00
160-170	0.00
170-180	0.00









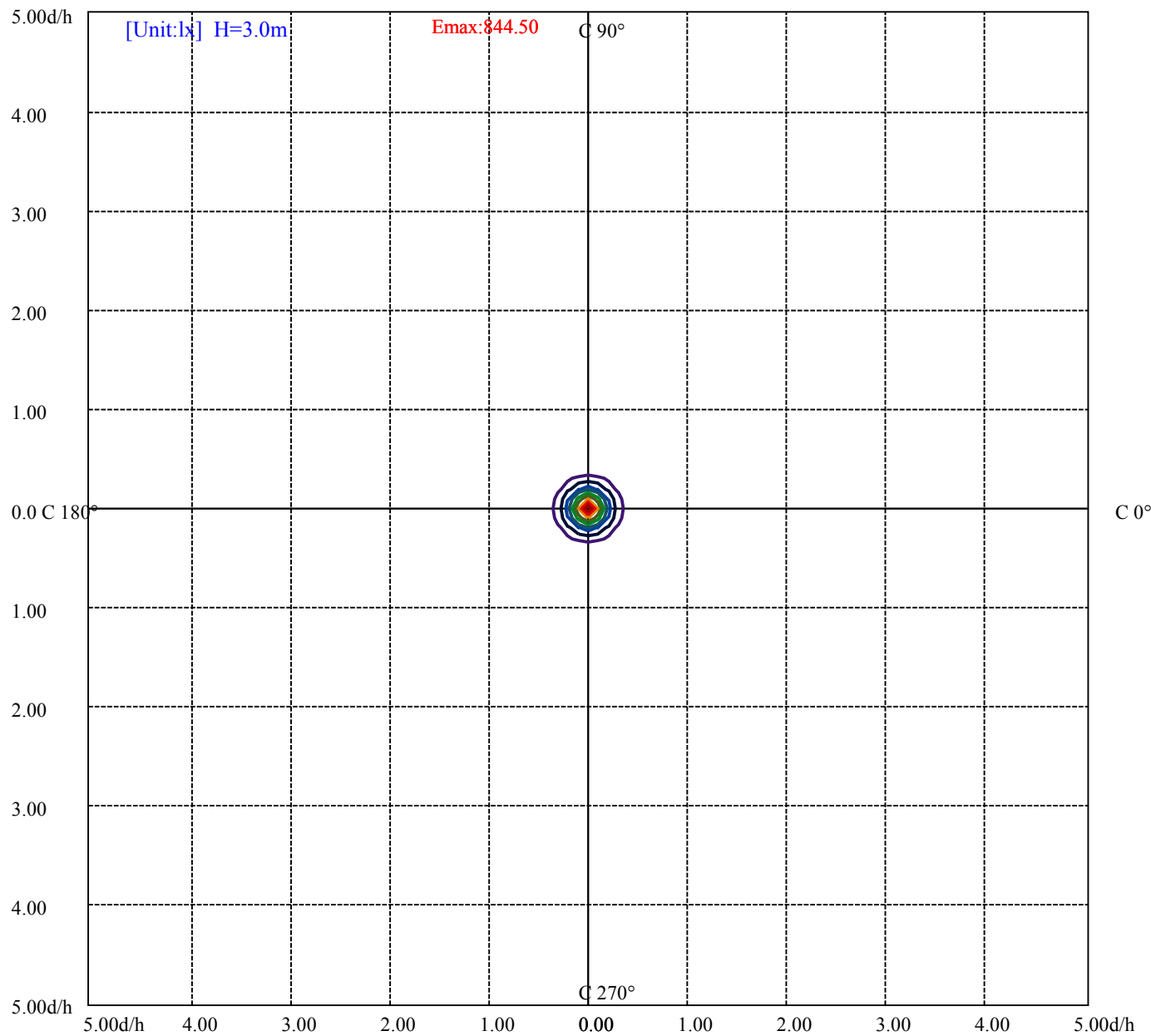
House

[Unit:cd]

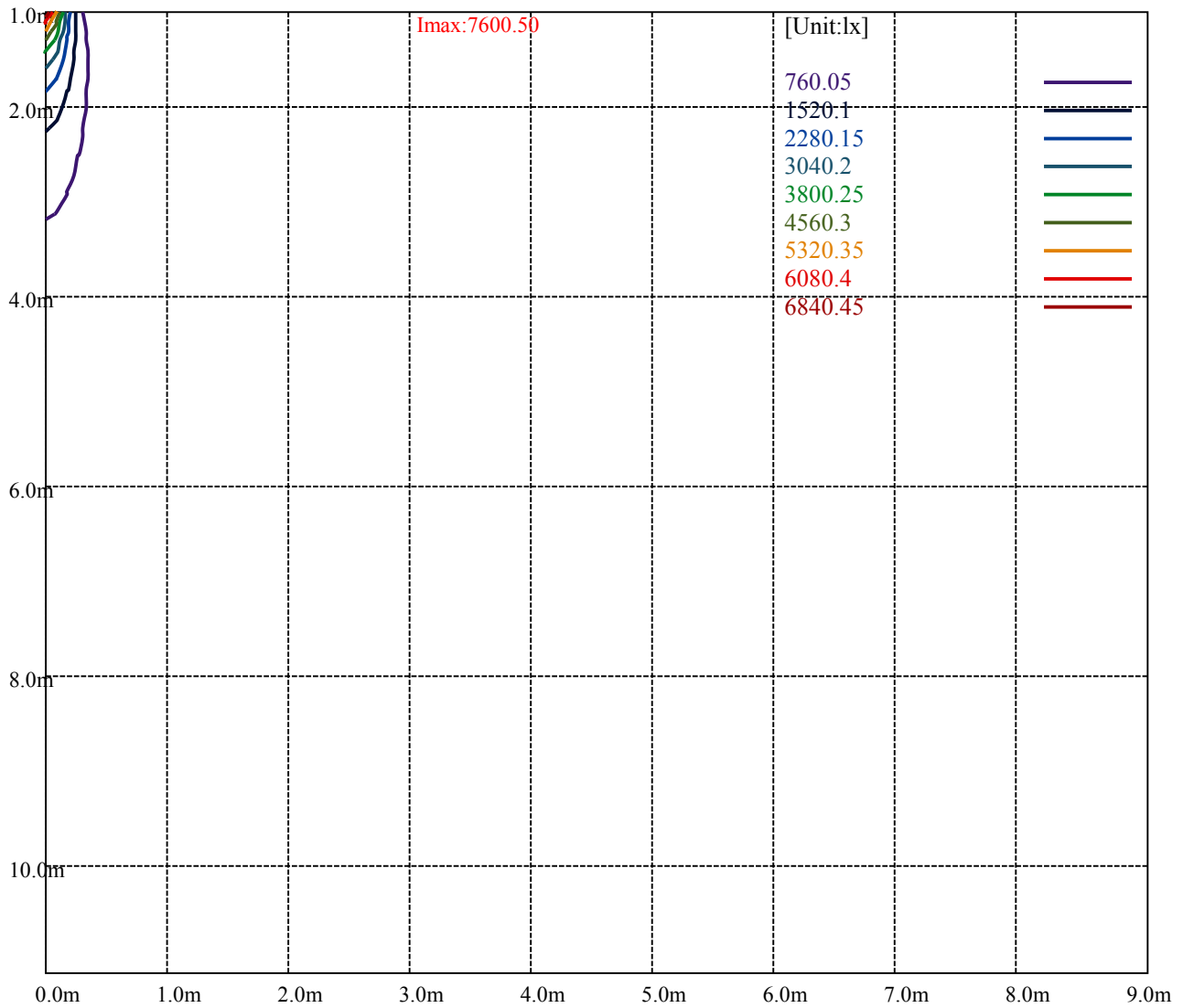
Road

Imax:7600.50

(10%Imax)	760.05	—
(20%Imax)	1520.1	—
(30%Imax)	2280.15	—
(40%Imax)	3040.2	—
(50%Imax)	3800.25	—
(60%Imax)	4560.3	—
(70%Imax)	5320.35	—
(80%Imax)	6080.4	—
(90%Imax)	6840.45	—



(10%Emax)	84.44978	—
(20%Emax)	168.9	—
(30%Emax)	253.35	—
(40%Emax)	337.7989	—
(50%Emax)	422.2489	—
(60%Emax)	506.6989	—
(70%Emax)	591.1489	—
(80%Emax)	675.5989	—
(90%Emax)	760.0489	—



Luminance Table

γ	45	50	55	60	65	70	75	80	85
C0	0	0	0	0	0	0	0	0	0
C45	0	0	0	0	0	0	0	0	0
C90	0	0	0	0	0	0	0	0	0

L(Hor)(65)	L(Ver)(65)	L45(65)	L(Hor)(75)	L(Ver)(75)	L45(75)	L(Hor)(85)	L(Ver)(85)	L45(85)
0	0	0	0	0	0	0	0	0

Glare Table

Glare	Quality	Service Values Illuminance(lx)							
1.15	A	2000	1000	500	≤ 300				
1.5	B		2000	1000	500	≤ 300			
1.85	C			2000	1000	500	≤ 300		
2.2	D				2000	1000	500	≤ 300	
2.55	E					2000	1000	500	≤ 300
		a	b	c	d	e	f	g	h

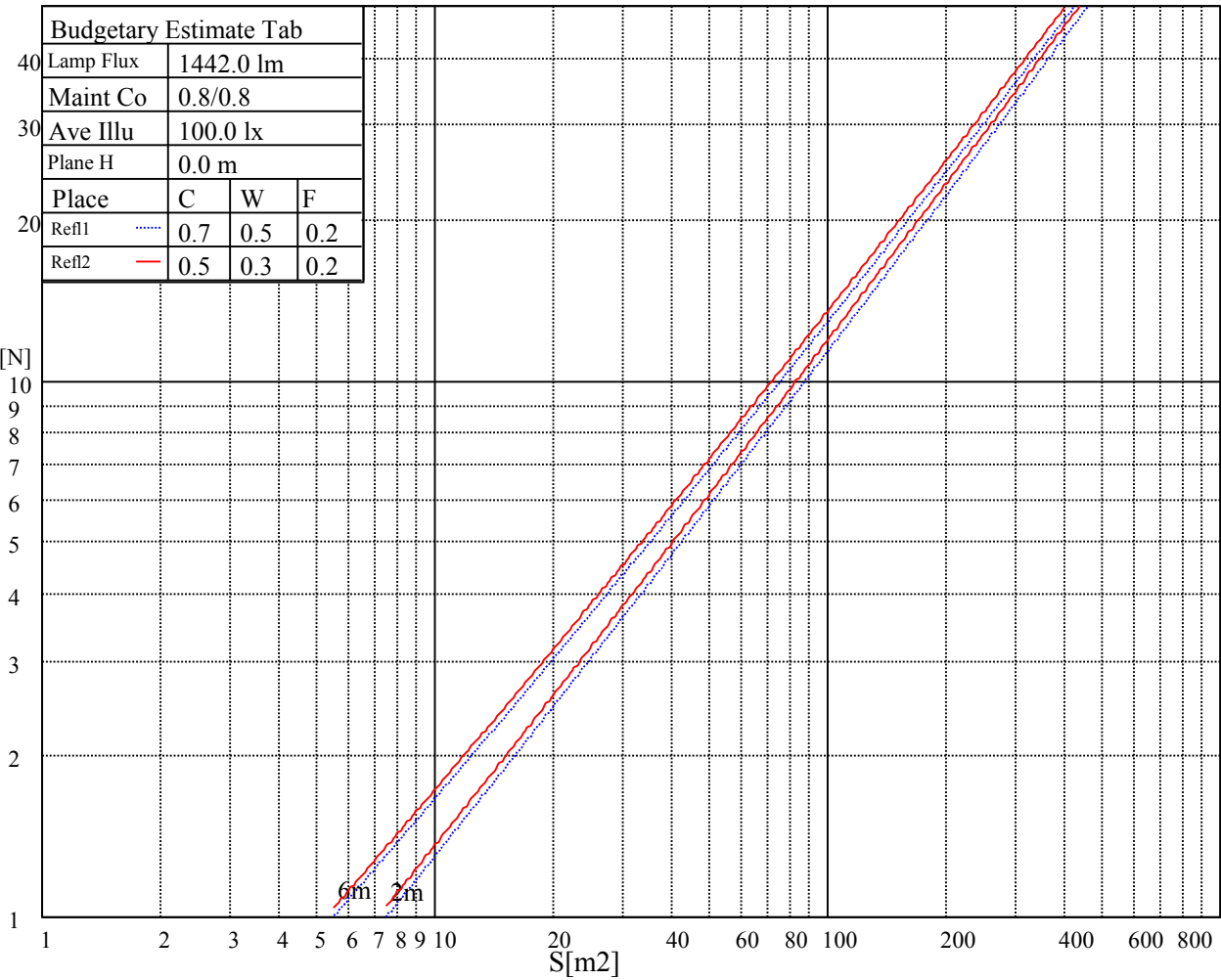
Luminance Limiting Curve

 $\gamma(^{\circ})$ 

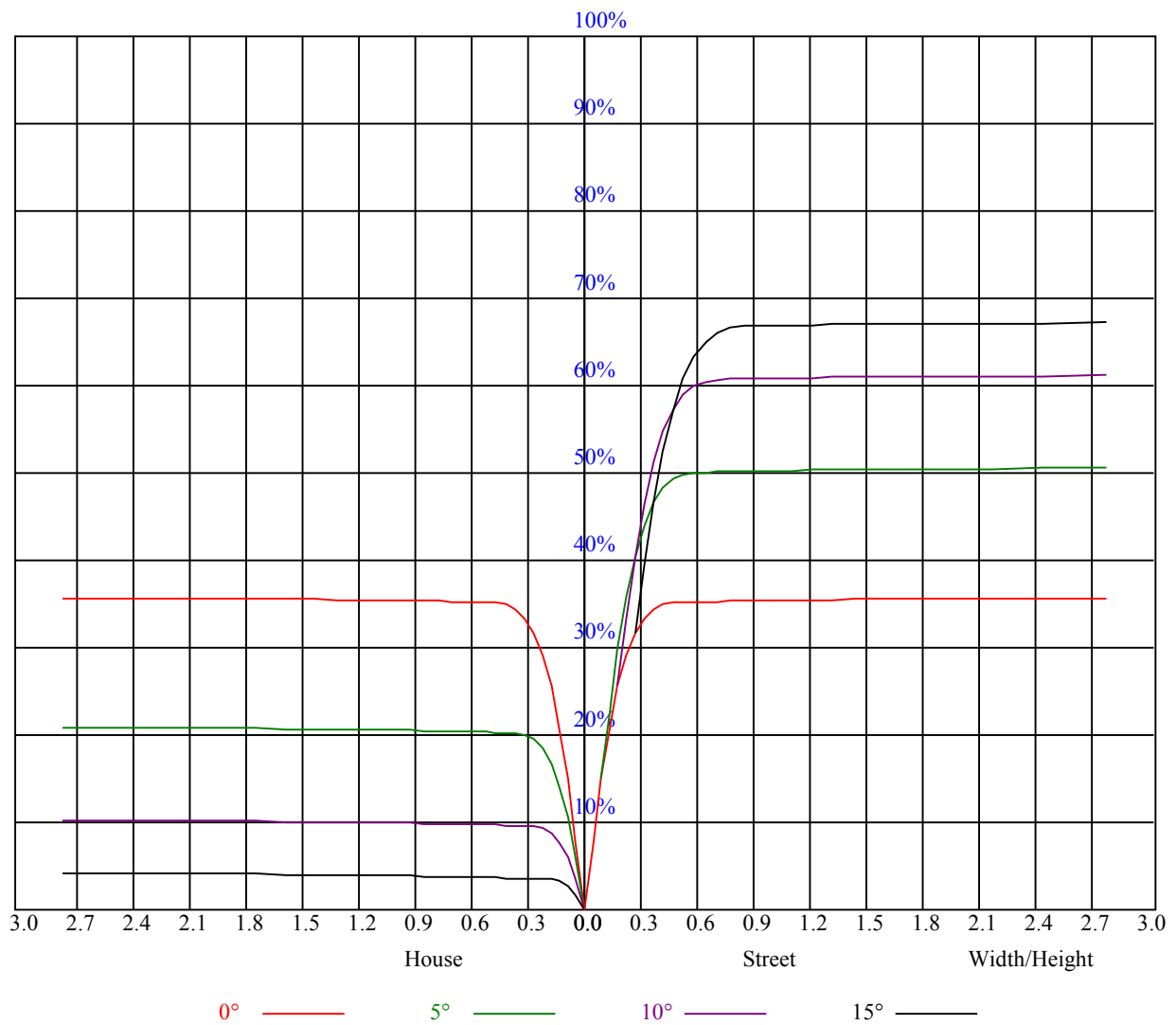
C0 ———

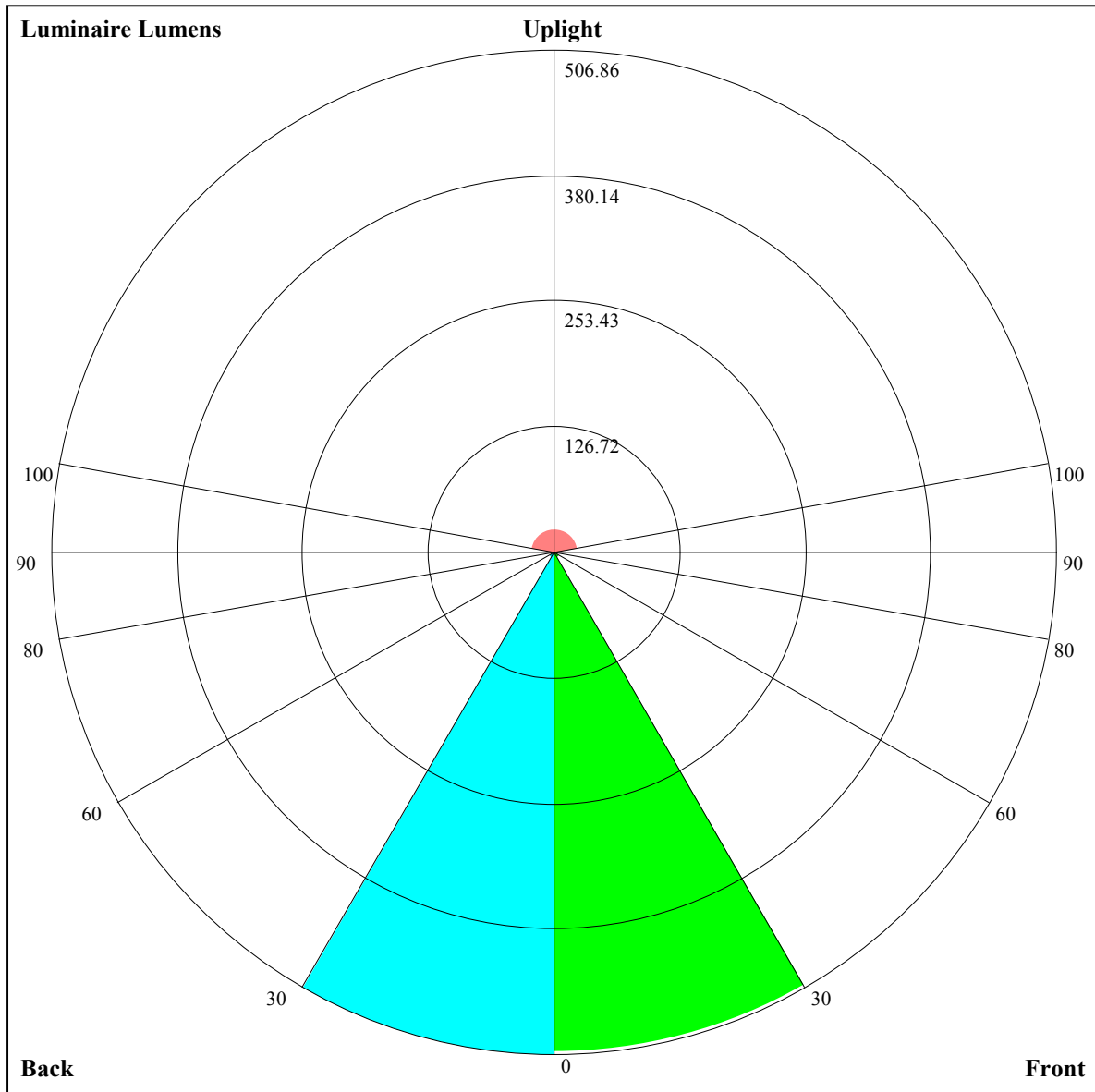
C45 ———

C90 ———



RHOCC	80			70			50			30			10			0
RHOW	50	30	10	50	30	10	50	30	10	50	30	10	50	30	10	0
RCR	COEFFICIENTS OF UTILIZATION RHOFC=20 CU															
0	0.86	0.86	0.86	0.84	0.84	0.84	0.80	0.80	0.80	0.77	0.77	0.77	0.73	0.73	0.73	0.72
1	0.81	0.80	0.79	0.80	0.79	0.77	0.77	0.76	0.75	0.74	0.74	0.73	0.72	0.71	0.71	0.70
2	0.78	0.76	0.74	0.77	0.75	0.73	0.74	0.73	0.72	0.72	0.71	0.70	0.70	0.70	0.69	0.68
3	0.75	0.73	0.71	0.74	0.72	0.70	0.72	0.70	0.69	0.71	0.69	0.68	0.69	0.68	0.67	0.66
4	0.72	0.70	0.68	0.72	0.69	0.67	0.70	0.68	0.67	0.69	0.67	0.66	0.68	0.66	0.65	0.64
5	0.70	0.68	0.66	0.70	0.67	0.65	0.69	0.66	0.65	0.68	0.66	0.64	0.67	0.65	0.64	0.63
6	0.68	0.66	0.64	0.68	0.65	0.63	0.67	0.65	0.63	0.66	0.64	0.63	0.65	0.64	0.62	0.62
7	0.67	0.64	0.62	0.66	0.64	0.62	0.65	0.63	0.62	0.65	0.63	0.61	0.64	0.62	0.61	0.60
8	0.65	0.62	0.61	0.65	0.62	0.60	0.64	0.62	0.60	0.63	0.61	0.60	0.63	0.61	0.60	0.59
9	0.64	0.61	0.59	0.63	0.61	0.59	0.63	0.61	0.59	0.62	0.60	0.59	0.62	0.60	0.59	0.58
10	0.62	0.60	0.58	0.62	0.60	0.58	0.61	0.59	0.58	0.61	0.59	0.58	0.61	0.59	0.58	0.57





Luminaire Lumens:

FL=504.38,FM=6.28,FH=4.87,FVH=2.57

BL=506.86,BM=6.26,BH=4.87,BVH=2.57

UL=5.11,UH=24.31

BUG Rating:B2-U2-G0

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Intensity data(cd)									
Appendix Page: 17 Total:19									
C/ γ (°)	0.0	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0
0.0	7592.63	7529.63	7213.50	6817.50	6386.06	5909.06	5311.13	4815.00	4321.69
45.0	7609.50	7578.00	7324.88	6969.38	6480.56	6048.00	5522.06	4942.69	4430.25
90.0	7617.38	7503.19	7170.19	6762.94	6296.06	5839.88	5289.75	4701.38	4187.81
135.0	7587.00	7587.56	7368.75	6968.25	6543.56	6161.06	5520.94	5019.75	4572.00
180.0	7592.63	7477.31	7122.38	6712.88	6266.25	5752.13	5211.00	4695.75	4131.00
225.0	7600.50	7437.38	7115.06	6661.69	6132.94	5654.81	5047.31	4555.69	4076.44
270.0	7617.38	7536.38	7293.38	6782.63	6320.25	5847.19	5248.69	4762.69	4282.88
315.0	7587.00	7383.94	7034.63	6562.69	6041.25	5560.88	5015.25	4458.94	3987.00
360.0	7592.63	7529.63	7213.50	6817.50	6386.06	5909.06	5311.13	4815.00	4321.69
C/ γ (°)	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0
0.0	3754.13	3350.25	2986.31	2614.50	2269.69	1987.88	1706.63	1474.31	1238.63
45.0	3894.75	3412.69	3024.56	2720.25	2286.00	2003.06	1778.06	1487.25	1254.38
90.0	3667.50	3169.13	2858.06	2534.06	2161.13	1895.06	1652.06	1399.50	1101.26
135.0	3915.00	3486.38	3142.13	2706.19	2352.38	2103.75	1784.25	1559.81	1349.44
180.0	3675.94	3230.44	2838.38	2522.25	2198.81	1904.06	1666.69	1445.06	1100.36
225.0	3640.50	3151.13	2811.94	2502.00	2142.56	1885.50	1653.19	1406.25	1113.75
270.0	3780.00	3323.25	2967.19	2602.13	2303.44	1994.63	1718.44	1487.81	1254.38
315.0	3558.94	3082.50	2744.44	2428.31	2066.63	1812.94	1580.06	1362.94	1114.09
360.0	3754.13	3350.25	2986.31	2614.50	2269.69	1987.88	1706.63	1474.31	1238.63
C/ γ (°)	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0	26.0
0.0	1029.38	858.94	681.75	515.25	381.94	289.69	142.14	72.62	29.93
45.0	1087.31	866.25	681.19	537.19	388.13	295.88	156.54	74.98	31.11
90.0	988.82	797.18	642.04	478.13	334.18	220.95	124.88	56.87	23.40
135.0	1105.88	928.13	758.81	568.69	434.25	300.38	174.26	93.04	38.19
180.0	1009.69	839.36	662.34	502.09	369.39	239.85	137.87	70.37	23.79
225.0	1004.29	818.33	659.19	495.79	346.95	234.11	127.86	53.27	20.98
270.0	1050.19	884.25	724.50	537.75	399.94	291.38	158.63	75.43	31.11
315.0	941.91	778.11	603.84	445.95	318.43	198.73	102.38	44.32	17.83
360.0	1029.38	858.94	681.75	515.25	381.94	289.69	142.14	72.62	29.93
C/ γ (°)	27.0	28.0	29.0	30.0	31.0	32.0	33.0	34.0	35.0
0.0	14.85	10.63	9.56	8.72	8.10	7.59	7.14	6.81	6.47
45.0	17.83	10.41	9.23	8.49	7.76	7.31	6.98	6.64	6.41
90.0	13.84	9.62	8.72	8.10	7.43	7.09	6.75	6.47	6.24
135.0	17.16	10.86	9.23	8.38	7.76	7.31	6.92	6.64	6.36
180.0	12.49	9.68	8.72	8.16	7.65	7.14	6.81	6.58	6.24
225.0	12.09	9.68	8.89	8.21	7.65	7.20	6.86	6.53	6.24
270.0	13.33	10.13	9.11	8.33	7.82	7.31	6.86	6.58	6.36
315.0	11.87	9.79	8.83	8.21	7.71	7.20	6.86	6.58	6.24
360.0	14.85	10.63	9.56	8.72	8.10	7.59	7.14	6.81	6.47
C/ γ (°)	36.0	37.0	38.0	39.0	40.0	41.0	42.0	43.0	44.0
0.0	6.24	6.02	5.91	5.74	5.63	5.57	5.40	5.40	5.29
45.0	6.19	6.02	5.91	5.74	5.63	5.51	5.46	5.40	5.34
90.0	6.08	5.91	5.74	5.63	5.51	5.46	5.40	5.29	5.23
135.0	6.13	6.02	5.85	5.68	5.57	5.51	5.40	5.34	5.29
180.0	6.08	5.96	5.79	5.68	5.57	5.46	5.40	5.34	5.29
225.0	6.08	5.91	5.74	5.63	5.57	5.46	5.40	5.34	5.29
270.0	6.13	5.96	5.79	5.63	5.57	5.46	5.40	5.34	5.29
315.0	6.08	5.85	5.74	5.63	5.51	5.40	5.34	5.29	5.23
360.0	6.24	6.02	5.91	5.74	5.63	5.57	5.40	5.40	5.29

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Intensity data(cd)									Appendix Page: 18 Total:19
C/ γ (°)	45.0	46.0	47.0	48.0	49.0	50.0	51.0	52.0	53.0
0.0	5.29	5.18	5.18	5.12	5.06	5.01	5.01	5.01	4.95
45.0	5.23	5.23	5.18	5.18	5.12	5.06	5.06	5.01	4.95
90.0	5.23	5.18	5.12	5.06	5.06	5.01	4.95	4.95	4.95
135.0	5.23	5.18	5.12	5.12	5.06	5.06	5.01	4.95	4.95
180.0	5.23	5.18	5.12	5.06	5.06	5.01	5.01	4.95	4.95
225.0	5.18	5.18	5.12	5.12	5.06	5.01	5.01	4.95	4.95
270.0	5.23	5.18	5.12	5.06	5.06	5.01	5.01	4.95	4.95
315.0	5.23	5.12	5.12	5.06	5.01	5.01	5.01	4.95	4.89
360.0	5.29	5.18	5.18	5.12	5.06	5.01	5.01	5.01	4.95
C/ γ (°)	54.0	55.0	56.0	57.0	58.0	59.0	60.0	61.0	62.0
0.0	4.95	4.89	4.89	4.89	4.84	4.84	4.78	4.84	4.78
45.0	4.95	4.95	4.95	4.89	4.89	4.84	4.89	4.84	4.84
90.0	4.89	4.89	4.89	4.84	4.89	4.84	4.84	4.78	4.78
135.0	4.95	4.89	4.89	4.89	4.84	4.84	4.84	4.84	4.78
180.0	4.95	4.89	4.89	4.84	4.84	4.84	4.84	4.78	4.78
225.0	4.95	4.89	4.89	4.89	4.89	4.84	4.84	4.78	4.78
270.0	4.89	4.89	4.89	4.89	4.89	4.84	4.84	4.84	4.78
315.0	4.89	4.89	4.84	4.84	4.84	4.84	4.78	4.84	4.78
360.0	4.95	4.89	4.89	4.89	4.84	4.84	4.78	4.84	4.78
C/ γ (°)	63.0	64.0	65.0	66.0	67.0	68.0	69.0	70.0	71.0
0.0	4.78	4.78	4.78	4.73	4.73	4.73	4.73	4.73	4.73
45.0	4.84	4.78	4.84	4.78	4.78	4.78	4.78	4.78	4.78
90.0	4.78	4.78	4.78	4.78	4.78	4.78	4.73	4.73	4.73
135.0	4.78	4.78	4.73	4.73	4.78	4.78	4.78	4.73	4.73
180.0	4.78	4.73	4.78	4.78	4.73	4.73	4.78	4.73	4.73
225.0	4.78	4.78	4.78	4.78	4.78	4.78	4.73	4.78	4.78
270.0	4.78	4.78	4.78	4.78	4.78	4.78	4.73	4.73	4.73
315.0	4.78	4.78	4.78	4.73	4.78	4.78	4.73	4.73	4.73
360.0	4.78	4.78	4.78	4.73	4.73	4.73	4.73	4.73	4.73
C/ γ (°)	72.0	73.0	74.0	75.0	76.0	77.0	78.0	79.0	80.0
0.0	4.73	4.73	4.73	4.67	4.67	4.67	4.67	4.73	4.67
45.0	4.73	4.78	4.73	4.78	4.73	4.73	4.73	4.73	4.73
90.0	4.73	4.73	4.73	4.73	4.73	4.73	4.73	4.73	4.67
135.0	4.73	4.73	4.73	4.73	4.73	4.73	4.73	4.67	4.67
180.0	4.73	4.73	4.73	4.73	4.73	4.73	4.73	4.73	4.73
225.0	4.73	4.73	4.78	4.73	4.73	4.73	4.73	4.78	4.73
270.0	4.73	4.73	4.73	4.73	4.73	4.73	4.73	4.73	4.73
315.0	4.73	4.73	4.73	4.73	4.73	4.73	4.73	4.73	4.73
360.0	4.73	4.73	4.73	4.67	4.67	4.67	4.67	4.73	4.67
C/ γ (°)	81.0	82.0	83.0	84.0	85.0	86.0	87.0	88.0	89.0
0.0	4.67	4.67	4.73	4.73	4.73	4.67	4.67	4.67	4.67
45.0	4.73	4.73	4.73	4.78	4.78	4.78	4.67	4.73	4.73
90.0	4.73	4.73	4.73	4.73	4.73	4.67	4.67	4.67	4.67
135.0	4.67	4.73	4.73	4.73	4.73	4.67	4.67	4.67	4.67
180.0	4.73	4.73	4.78	4.73	4.73	4.67	4.67	4.67	4.67
225.0	4.73	4.73	4.73	4.73	4.78	4.73	4.73	4.73	4.73
270.0	4.73	4.73	4.73	4.73	4.73	4.73	4.78	4.78	4.73
315.0	4.73	4.73	4.73	4.73	4.73	4.78	4.78	4.67	4.67
360.0	4.67	4.67	4.73	4.73	4.73	4.67	4.67	4.67	4.67

Intensity data(cd)

Appendix Page: 19 Total:19

C/ γ (°)	90.0
0.0	4.67
45.0	4.73
90.0	4.67
135.0	4.67
180.0	4.67
225.0	4.73
270.0	4.67
315.0	4.67
360.0	4.67