
NATA

Client:

LumCAT: 4-2273-M

Luminaire: 92.70.135.00

Report No: NT2018010519

Test No: GC2018010519

LampCAT: BXR-V-DR-1830-H-3000-A-13

Lamp flux(lm): 1355.0

Number of Lamps: 1

Length(mm): 100

Phm Type: C

Voltage(V): 220.4000

Current(A): 0.0950

Power (W): 19.2500

PF: 0.9190

Ballast type: AC

Width(mm): 100

Height(mm): 0

Photometric Results

Lumens(lm): 1206.27, Efficiency(%): 89.02% , Luminous Efficacy(lm/W): 62.66

Central intensity(cd): 14426.240, Maximum intensity(cd): 14426.240

Angle of maximum intensity: C=0.0 γ =0.0

Beam Angle(50%Imax): [C0/180]Total=10.6

[C90/270]Total=10.6

Field angle(10%Imax): [C0/180]Total=23.6

[C90/270]Total=23.6

Maximum s/h(1/2): C0_180=0.18 C90_270=0.18

Maximum s/h(1/4): C0_180=0.20 C90_270=0.20

Up flux rate of lamp(%): 0.00%

Down flux rate of lamp(%): 89.28%

Up flux rate of LUM(%): - -

Down flux rate of LUM(%): 100.00%

CIE Type : Direct lighting

Output flux ratio in π solid angle : 99.306%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
0.0	14426.243	3.451	3.451	.255%	.286%
1.0	14094.459	26.975	30.426	1.991%	2.522%
2.0	12540.805	47.995	78.421	3.542%	6.501%
3.0	10895.969	62.534	140.955	4.615%	11.685%
4.0	9284.242	71.020	211.976	5.241%	17.573%
5.0	7673.930	73.344	285.32	5.413%	23.653%
6.0	6109.963	70.037	355.356	5.169%	29.459%
7.0	4768.094	63.722	419.079	4.703%	34.742%
8.0	3638.405	55.529	474.607	4.098%	39.345%
9.0	2837.483	48.676	523.284	3.592%	43.380%
10.0	2229.657	42.458	565.742	3.133%	46.900%
11.0	1891.191	39.572	605.314	2.920%	50.180%
12.0	1356.753	30.934	636.247	2.283%	52.745%
13.0	1009.493	24.903	661.15	1.838%	54.809%
14.0	879.958	23.345	684.494	1.723%	56.745%
15.0	770.754	21.876	706.37	1.614%	58.558%
16.0	684.670	20.695	727.065	1.527%	60.274%
17.0	626.503	20.087	747.152	1.482%	61.939%
18.0	586.289	19.868	767.02	1.466%	63.586%
19.0	555.152	19.820	786.84	1.463%	65.229%
20.0	531.707	19.942	806.782	1.472%	66.882%
21.0	515.292	20.250	827.033	1.494%	68.561%
22.0	502.281	20.634	847.666	1.523%	70.271%
23.0	489.219	20.962	868.628	1.547%	72.009%
24.0	480.460	21.430	890.058	1.582%	73.786%
25.0	472.038	21.876	911.935	1.614%	75.599%
26.0	465.217	22.364	934.299	1.650%	77.453%
27.0	458.204	22.812	957.11	1.684%	79.344%
28.0	451.255	23.232	980.342	1.715%	81.270%
29.0	444.474	23.630	1003.973	1.744%	83.229%
30.0	436.922	23.957	1027.929	1.768%	85.215%
31.0	429.057	24.233	1052.162	1.788%	87.224%
32.0	419.057	24.352	1076.514	1.797%	89.243%
33.0	400.078	23.895	1100.409	1.763%	91.224%
34.0	367.166	22.515	1122.924	1.662%	93.090%
35.0	320.322	20.148	1143.072	1.487%	94.761%
36.0	260.706	16.804	1159.876	1.240%	96.154%
37.0	213.455	14.087	1173.964	1.040%	97.321%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
38.0	156.043	10.535	1184.499	.777%	98.195%
39.0	88.688	6.121	1190.619	.452%	98.702%
40.0	38.979	2.748	1193.367	.203%	98.930%
41.0	18.074	1.300	1194.667	.096%	99.038%
42.0	10.679	0.784	1195.451	.058%	99.103%
43.0	7.807	0.584	1196.035	.043%	99.151%
44.0	6.114	0.466	1196.5	.034%	99.190%
45.0	5.110	0.396	1196.897	.029%	99.223%
46.0	4.733	0.373	1197.27	.028%	99.254%
47.0	4.472	0.359	1197.629	.026%	99.283%
48.0	4.234	0.345	1197.974	.025%	99.312%
49.0	4.066	0.337	1198.31	.025%	99.340%
50.0	3.834	0.322	1198.632	.024%	99.366%
51.0	3.637	0.310	1198.942	.023%	99.392%
52.0	3.451	0.298	1199.24	.022%	99.417%
53.0	3.318	0.291	1199.531	.021%	99.441%
54.0	3.132	0.278	1199.809	.021%	99.464%
55.0	2.976	0.267	1200.076	.020%	99.486%
56.0	2.860	0.260	1200.336	.019%	99.508%
57.0	2.738	0.252	1200.588	.019%	99.529%
58.0	2.587	0.241	1200.829	.018%	99.549%
59.0	2.483	0.233	1201.062	.017%	99.568%
60.0	2.407	0.229	1201.29	.017%	99.587%
61.0	2.285	0.219	1201.51	.016%	99.605%
62.0	2.187	0.212	1201.721	.016%	99.623%
63.0	2.129	0.208	1201.929	.015%	99.640%
64.0	2.065	0.204	1202.133	.015%	99.657%
65.0	1.972	0.196	1202.329	.014%	99.673%
66.0	1.908	0.191	1202.52	.014%	99.689%
67.0	1.839	0.186	1202.706	.014%	99.704%
68.0	1.816	0.185	1202.89	.014%	99.719%
69.0	1.769	0.181	1203.071	.013%	99.735%
70.0	1.688	0.174	1203.245	.013%	99.749%
71.0	1.636	0.170	1203.415	.013%	99.763%
72.0	1.618	0.169	1203.584	.012%	99.777%
73.0	1.618	0.170	1203.753	.013%	99.791%
74.0	1.555	0.164	1203.917	.012%	99.805%
75.0	1.502	0.159	1204.076	.012%	99.818%

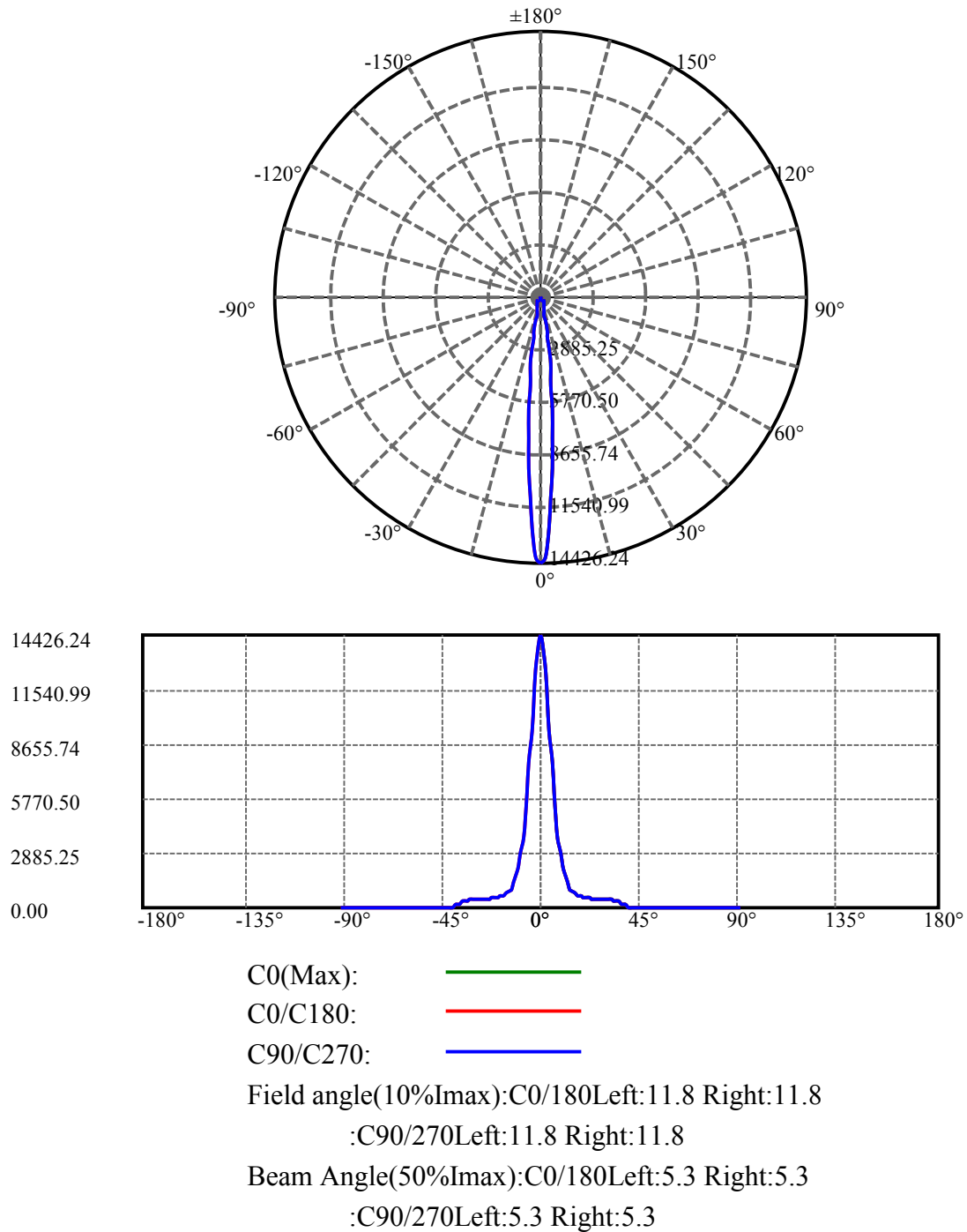
$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
76.0	1.520	0.162	1204.238	.012%	99.831%
77.0	1.520	0.162	1204.401	.012%	99.845%
78.0	1.468	0.157	1204.558	.012%	99.858%
79.0	1.433	0.154	1204.712	.011%	99.871%
80.0	1.421	0.153	1204.866	.011%	99.883%
81.0	1.415	0.153	1205.019	.011%	99.896%
82.0	1.386	0.151	1205.169	.011%	99.908%
83.0	1.392	0.152	1205.321	.011%	99.921%
84.0	1.351	0.147	1205.468	.011%	99.933%
85.0	1.346	0.147	1205.615	.011%	99.945%
86.0	1.340	0.147	1205.762	.011%	99.958%
87.0	1.328	0.145	1205.907	.011%	99.970%
88.0	1.322	0.145	1206.052	.011%	99.982%
89.0	1.334	0.146	1206.199	.011%	99.994%
90.0	1.375	0.075	1206.274	.006%	100.000%

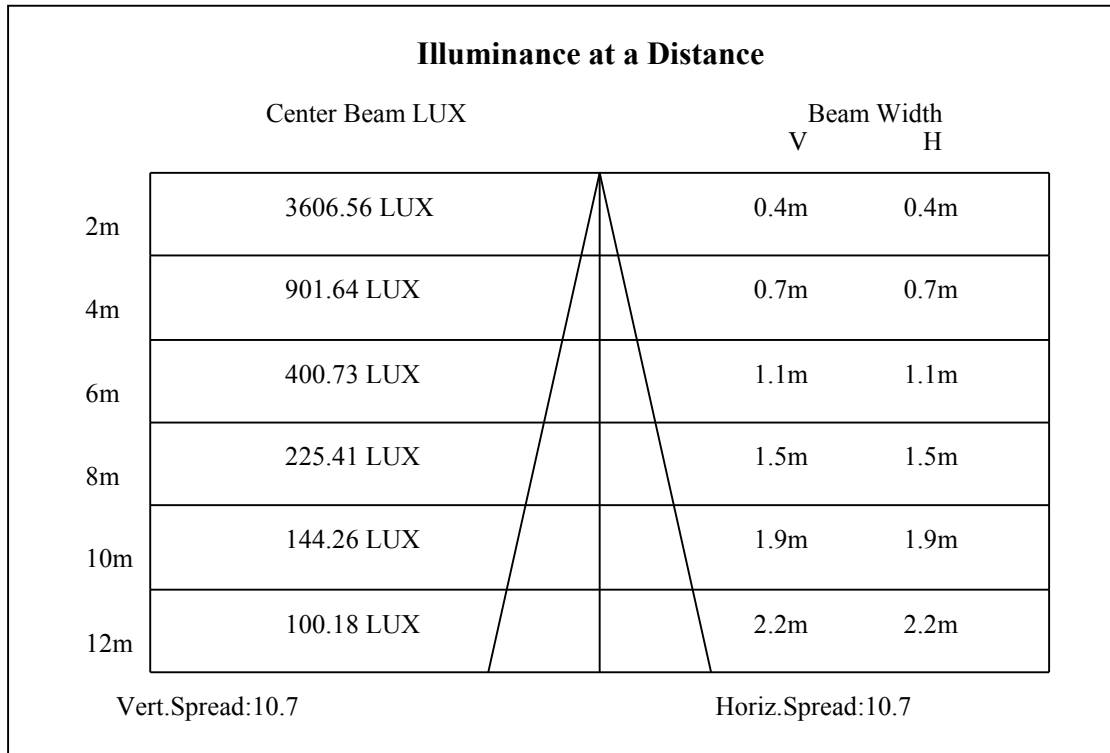
ZONAL LUMEN SUMMARY

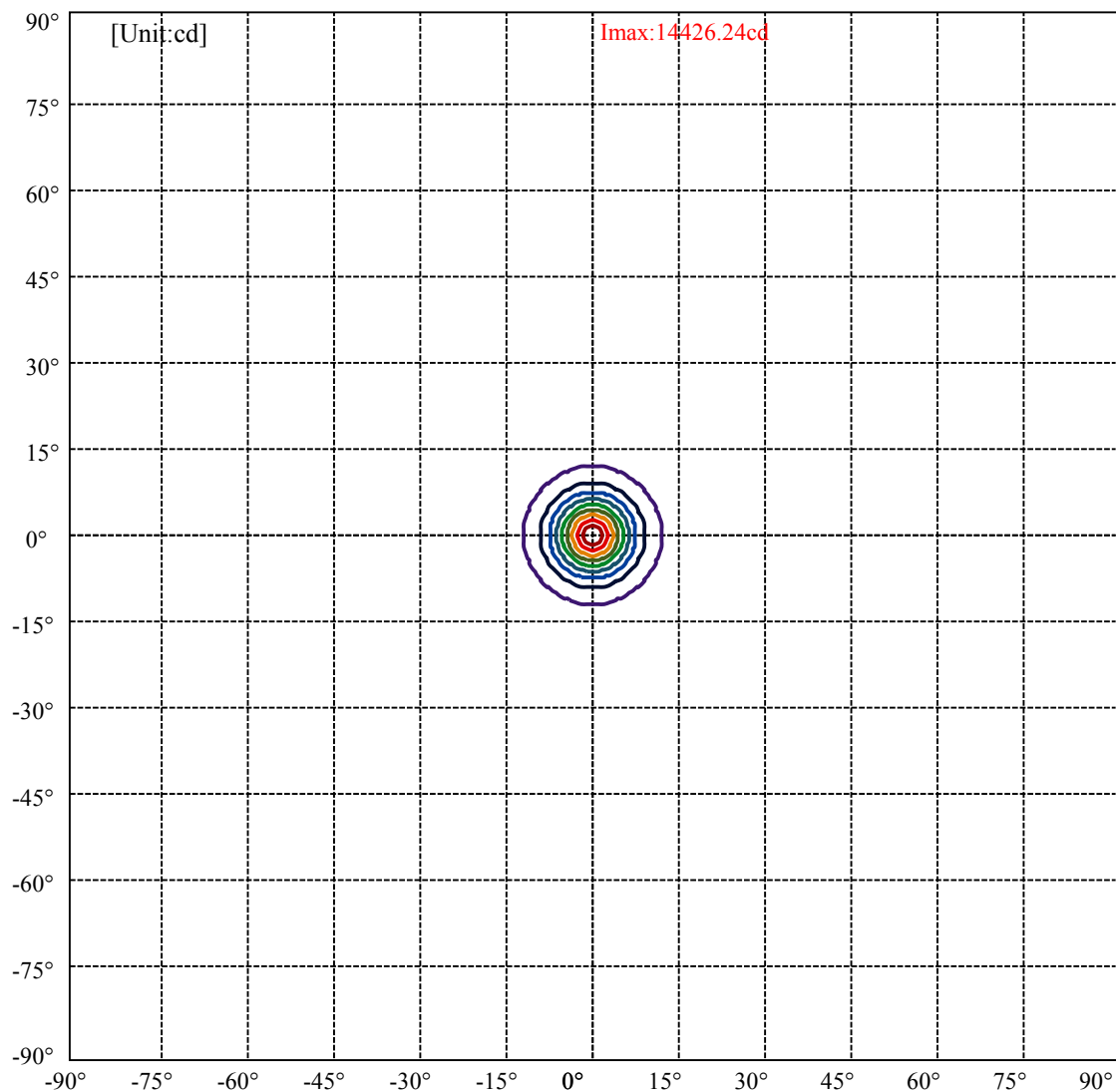
Zone	Lumens	%Lamp	%Fixt
0-30	1027.93	75.86%	85.22%
0-40	1193.37	88.07%	98.93%
0-60	1201.29	88.66%	99.59%
0-90	1206.20	89.02%	99.99%
0-120	1206.20	89.02%	99.99%
0-180	1206.27	89.02%	100.00%
60-90	5.14	0.38%	0.43%
90-120	0.00	0.00%	0.00%
90-130	0.00	0.00%	0.00%
90-150	0.00	0.00%	0.00%
90-180	0.00	0.00%	0.00%
0-27.34	965.02	71.22%	80.00%

ZONAL LUMEN SUMMARY

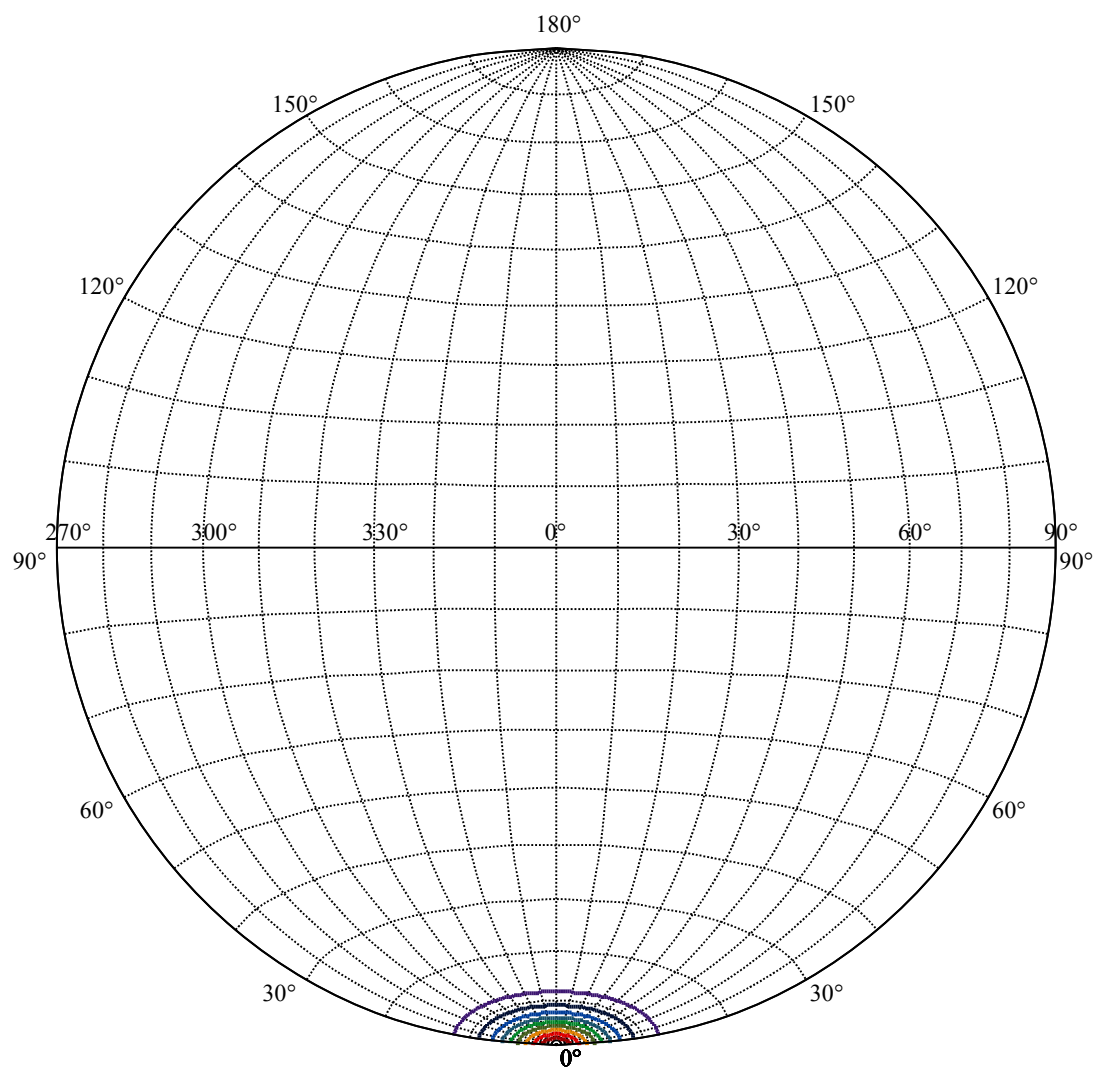
0-10	565.74
10-20	241.04
20-30	221.15
30-40	165.44
40-50	5.27
50-60	2.66
60-70	1.95
70-80	1.62
80-90	1.33
90-100	0.00
100-110	0.00
110-120	0.00
120-130	0.00
130-140	0.00
140-150	0.00
150-160	0.00
160-170	0.00
170-180	0.00







(10%Imax)	1442.62	—
(20%Imax)	2885.25	—
(30%Imax)	4327.87	—
(40%Imax)	5770.5	—
(50%Imax)	7213.12	—
(60%Imax)	8655.74	—
(70%Imax)	10098.4	—
(80%Imax)	11541	—
(90%Imax)	12983.6	—



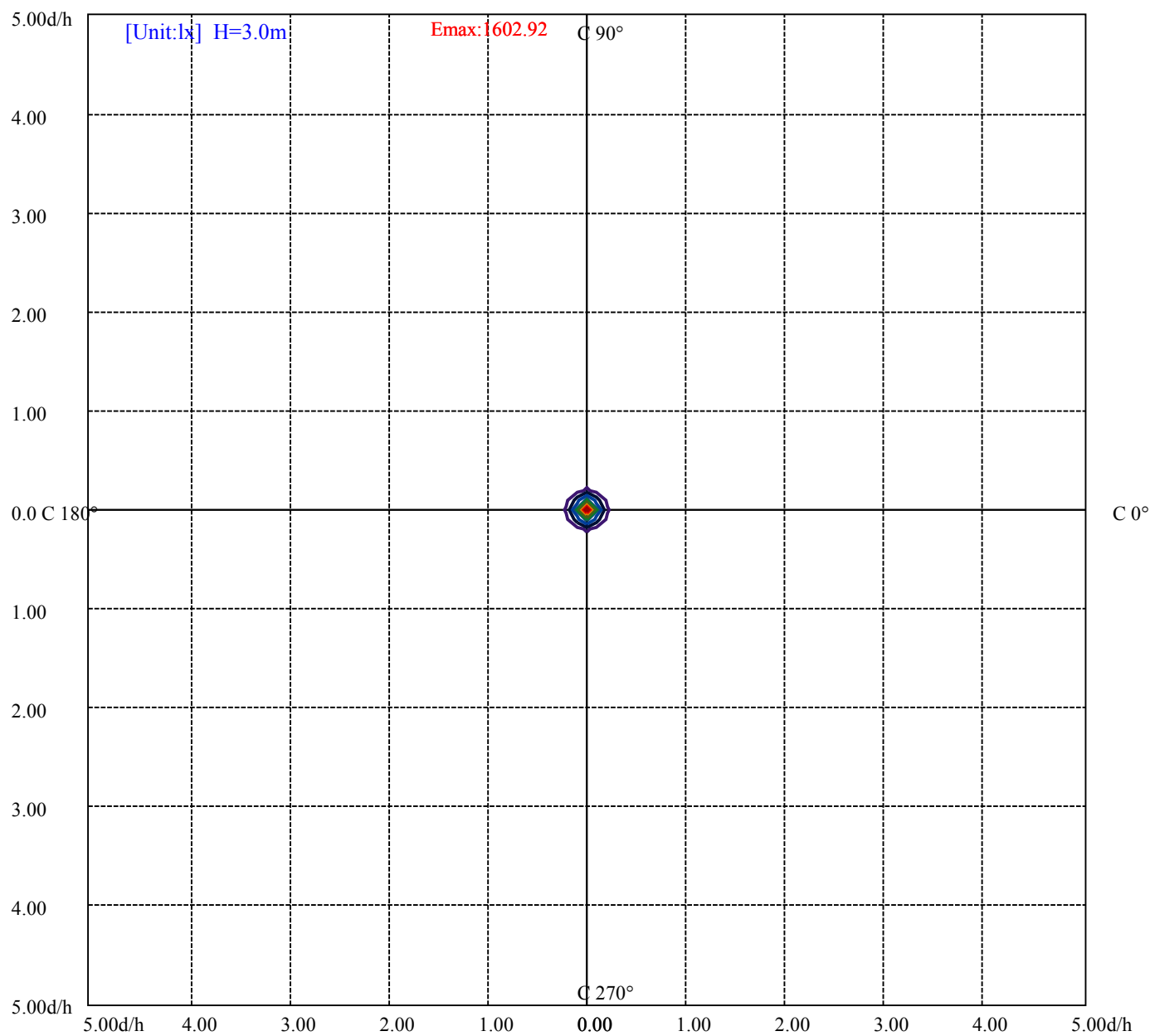
House

[Unit:cd]

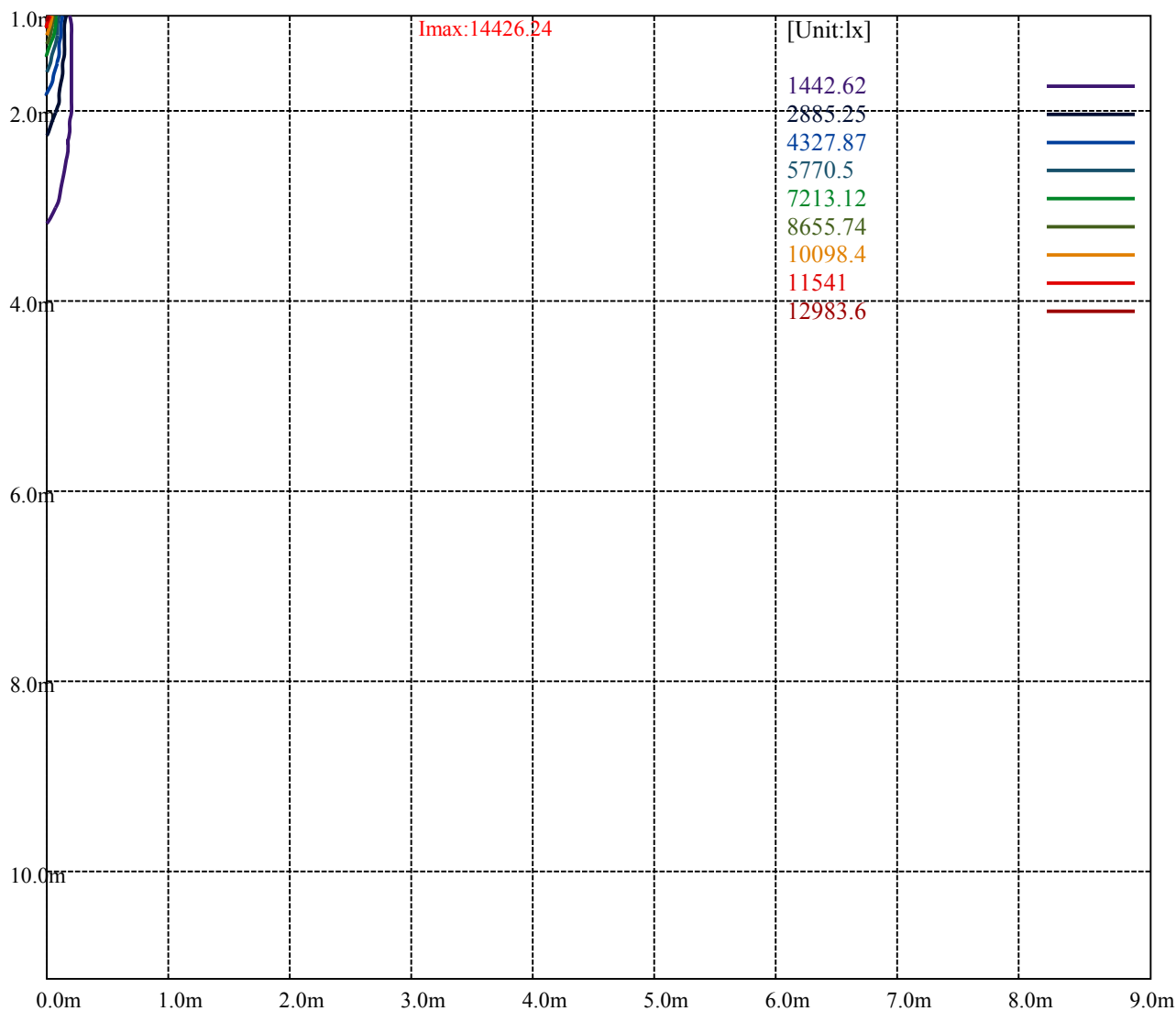
Road

Imax:14426.24

(10%Imax)	1442.62	—
(20%Imax)	2885.25	—
(30%Imax)	4327.87	—
(40%Imax)	5770.5	—
(50%Imax)	7213.12	—
(60%Imax)	8655.74	—
(70%Imax)	10098.4	—
(80%Imax)	11541	—
(90%Imax)	12983.6	—



(10%E _{max}) 160.2911	—
(20%E _{max}) 320.5822	—
(30%E _{max}) 480.8733	—
(40%E _{max}) 641.1644	—
(50%E _{max}) 801.4556	—
(60%E _{max}) 961.7455	—
(70%E _{max}) 1122.033	—
(80%E _{max}) 1282.333	—
(90%E _{max}) 1442.622	—



Luminance Table

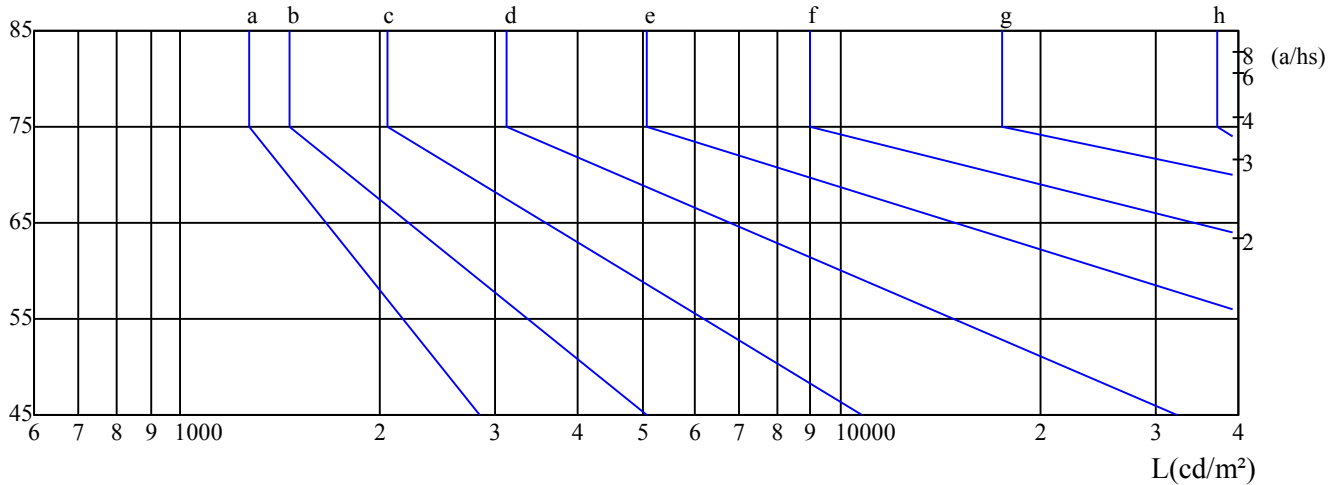
γ	45	50	55	60	65	70	75	80	85
C0	433	332	265	223	191	174	166	171	178
C45	371	280	220	182	154	137	128	128	131
C90	433	332	265	223	191	174	166	171	178

L(Hor)(65)	L(Ver)(65)	L45(65)	L(Hor)(75)	L(Ver)(75)	L45(75)	L(Hor)(85)	L(Ver)(85)	L45(85)
467	467	467	580	580	580	1544	1544	1544

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

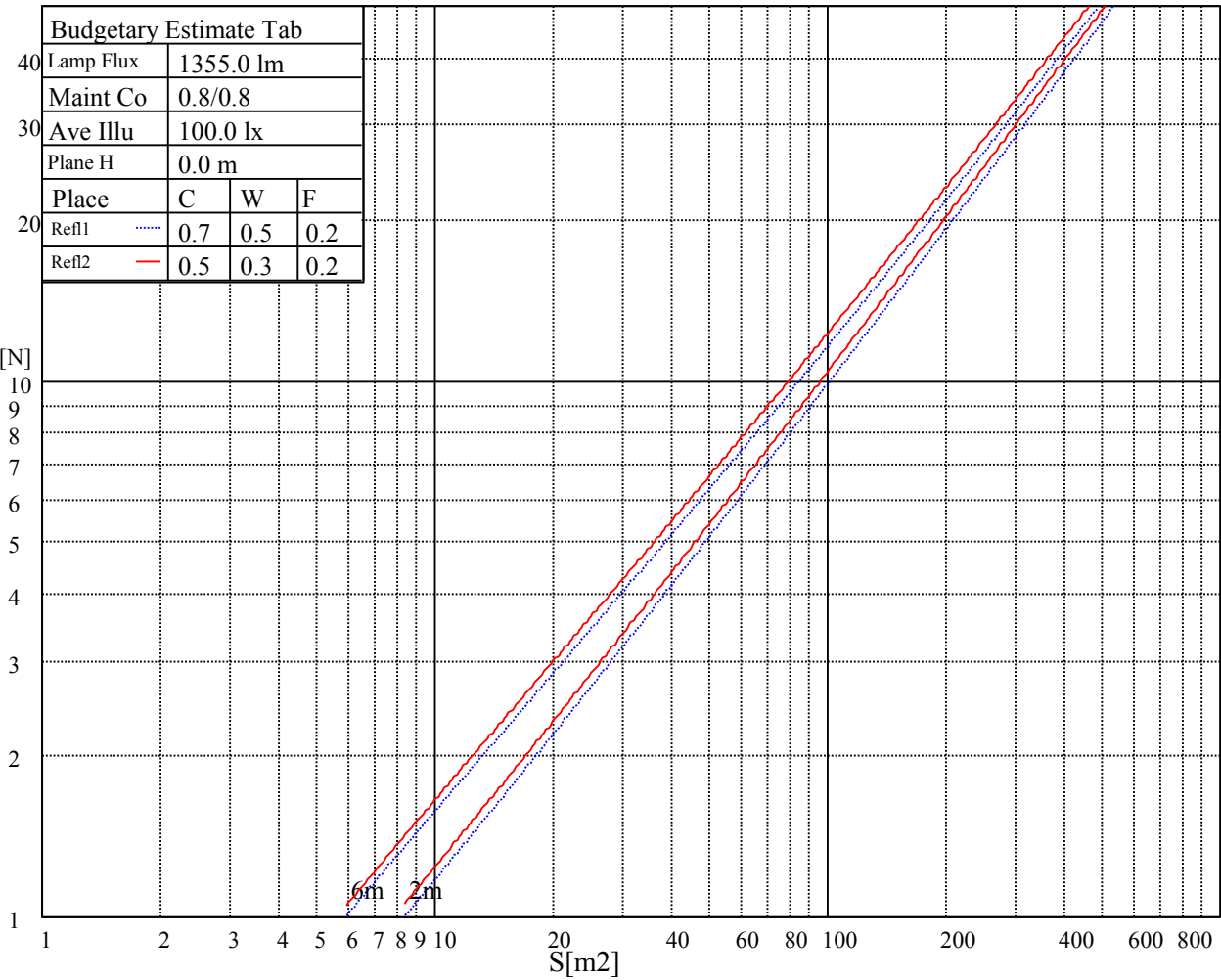
Luminance Limiting Curve

 $\gamma(^{\circ})$ 

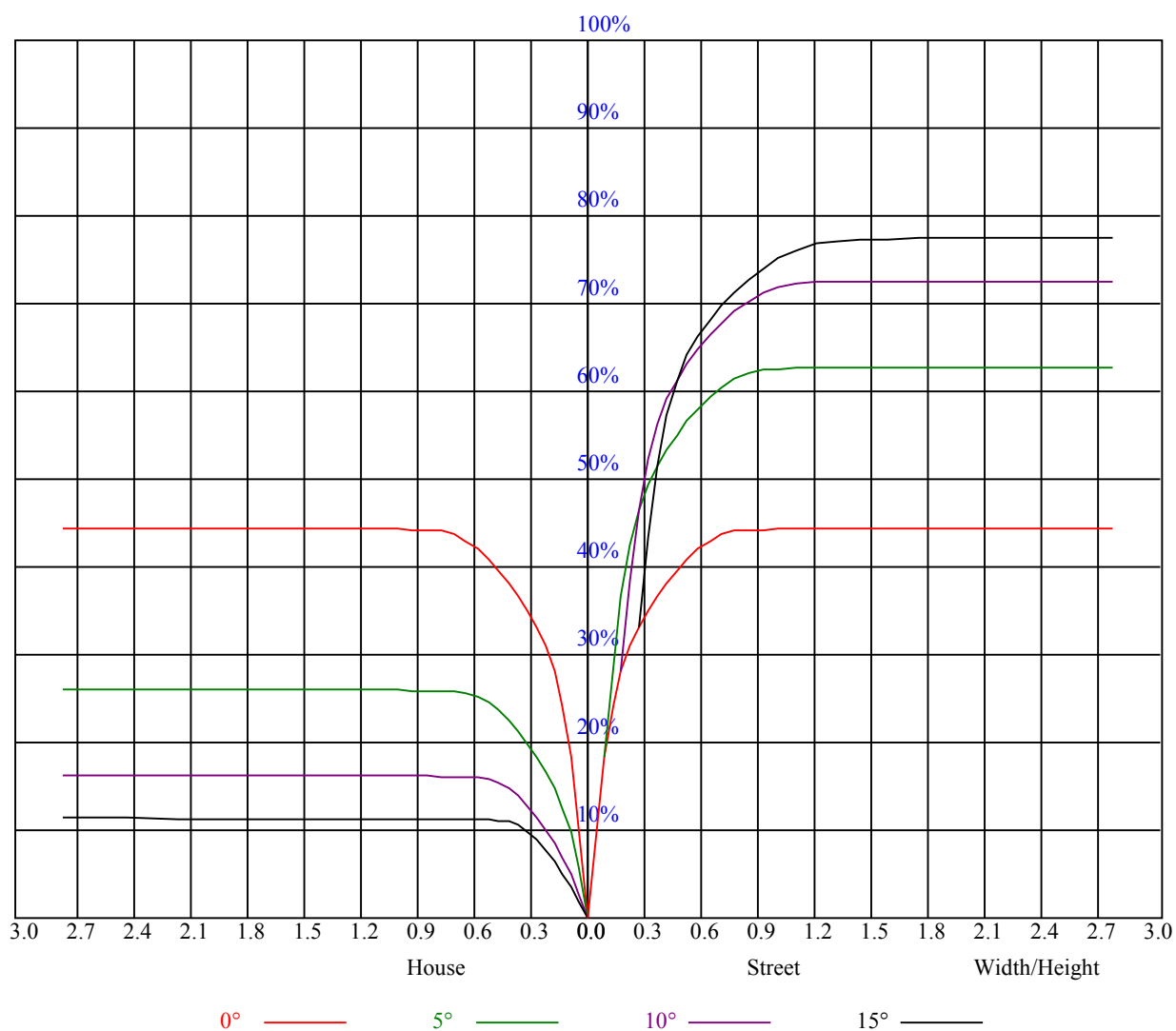
C0 ———

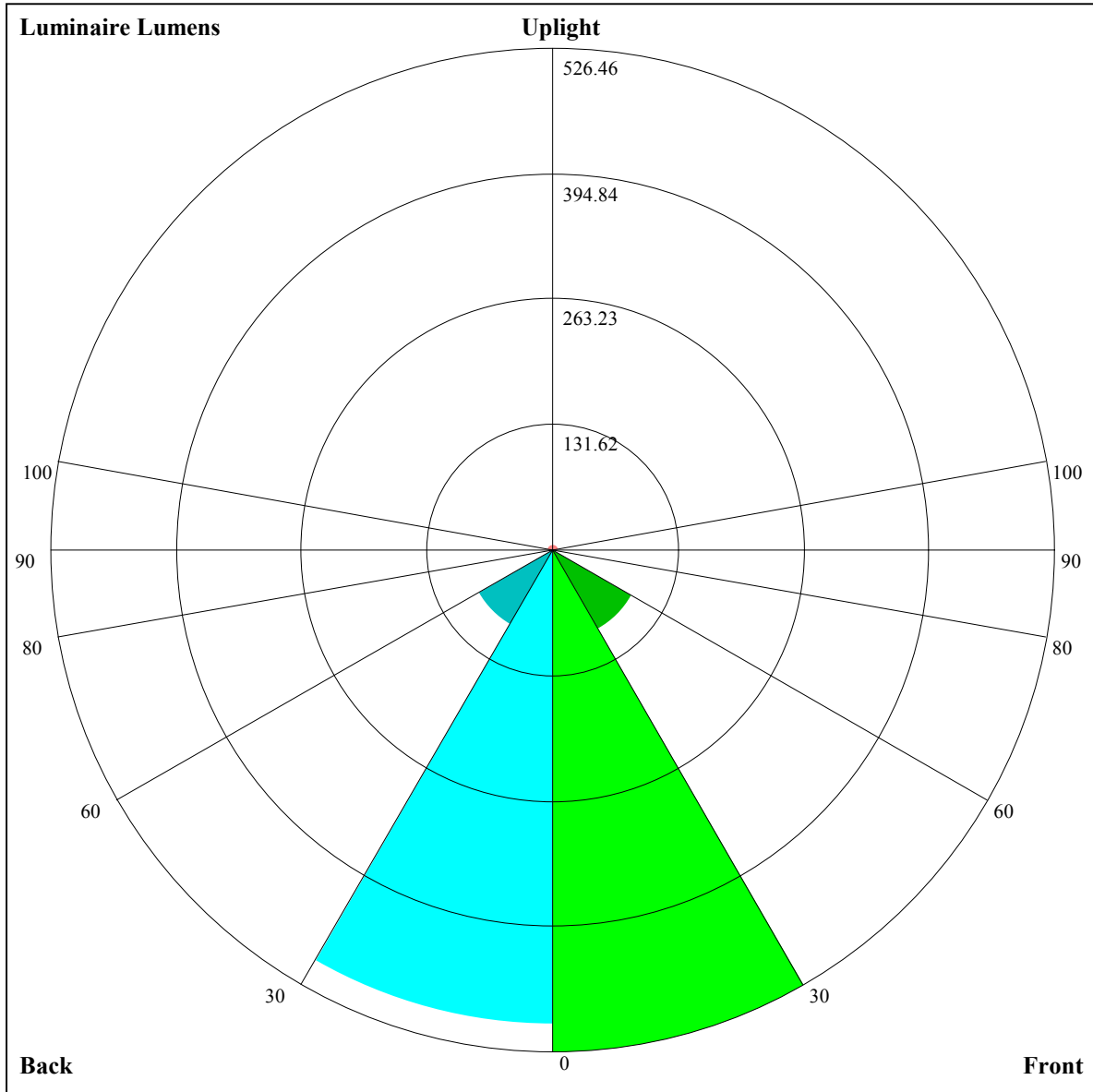
C45 ———

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	1.06	1.06	1.06	1.04	1.04	1.04	0.99	0.99	0.99	0.95	0.95	0.95	0.91	0.91	0.91	0.89
1	1.00	0.98	0.97	0.98	0.97	0.95	0.95	0.94	0.92	0.92	0.91	0.90	0.89	0.88	0.87	0.86
2	0.95	0.93	0.90	0.94	0.91	0.89	0.91	0.89	0.87	0.89	0.87	0.85	0.86	0.85	0.84	0.82
3	0.91	0.88	0.85	0.90	0.87	0.84	0.88	0.85	0.83	0.86	0.84	0.82	0.84	0.82	0.81	0.79
4	0.87	0.84	0.81	0.86	0.83	0.80	0.85	0.82	0.80	0.83	0.81	0.79	0.81	0.79	0.78	0.77
5	0.84	0.80	0.77	0.83	0.80	0.77	0.82	0.79	0.76	0.80	0.78	0.76	0.79	0.77	0.75	0.74
6	0.81	0.77	0.74	0.80	0.77	0.74	0.79	0.76	0.74	0.78	0.75	0.73	0.77	0.75	0.73	0.72
7	0.78	0.75	0.72	0.78	0.74	0.72	0.77	0.74	0.71	0.76	0.73	0.71	0.75	0.73	0.71	0.70
8	0.76	0.72	0.70	0.76	0.72	0.69	0.75	0.71	0.69	0.74	0.71	0.69	0.73	0.71	0.69	0.68
9	0.74	0.70	0.67	0.73	0.70	0.67	0.73	0.69	0.67	0.72	0.69	0.67	0.71	0.69	0.67	0.66
10	0.72	0.68	0.66	0.71	0.68	0.66	0.71	0.68	0.65	0.70	0.67	0.65	0.70	0.67	0.65	0.64





Luminaire Lumens:

FL=526.46,FM=95.37,FH=1.85,FVH=0.75

BL=497.33,BM=89.34,BH=1.77,BVH=0.74

UL=1.5,UH=7.14

BUG Rating:B1-U1-G0

NATA 4-2273-M

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	14339.24	14311.39	13485.42	11207.01	8778.17	8037.57	6282.13	4825.07	3684.01
45.0	14241.79	14255.71	13476.13	11995.87	10190.78	8297.52	6427.47	5425.15	4102.66
90.0	14158.26	12882.17	8633.85	8633.85	7474.70	5744.32	4373.56	3330.41	2550.84
135.0	14965.68	14445.96	13248.76	11564.32	9633.94	7708.20	5995.92	4622.38	3531.90
180.0	14339.24	14000.49	12297.49	10548.08	9401.92	6812.61	5852.06	4515.65	3457.65
225.0	14241.79	13439.01	11091.00	8623.64	8238.03	6402.78	4881.68	3722.99	2848.75
270.0	14158.26	14766.15	14580.53	13536.46	11921.62	10121.17	8232.56	6404.26	4877.59
315.0	14965.68	14654.78	13513.26	11058.52	8634.78	8267.27	6834.33	5298.84	4053.84
360.0	14339.24	14311.39	13485.42	11207.01	8778.17	8037.57	6282.13	4825.07	3684.01
C/ γ (°)	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0
0.0	2818.12	2166.62	1687.74	1327.18	891.69	891.69	813.22	716.89	650.76
45.0	3160.67	2450.70	2450.70	1439.48	1145.28	937.39	798.65	705.84	643.66
90.0	1973.58	1545.74	1083.10	865.79	839.76	733.17	673.17	611.46	573.41
135.0	3007.54	2427.50	2427.50	1305.37	1041.34	858.97	738.79	659.90	608.39
180.0	2640.95	2371.81	1863.60	1232.52	987.97	822.31	715.59	645.98	599.58
225.0	2301.65	1698.87	1404.68	868.67	868.67	794.19	703.24	641.62	595.54
270.0	3722.15	2835.85	2408.94	2408.94	1440.41	1141.10	937.86	802.36	709.55
315.0	3075.20	2340.17	1803.28	1406.07	860.83	860.83	785.52	693.31	631.13
360.0	2818.12	2166.62	1687.74	1327.18	891.69	891.69	813.22	716.89	650.76
C/ γ (°)	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0	26.0
0.0	602.69	566.21	539.76	519.53	503.80	490.90	479.95	470.81	462.36
45.0	598.65	564.78	539.25	519.76	510.48	491.92	485.43	475.68	467.33
90.0	550.81	529.14	512.11	498.28	486.49	476.52	468.49	461.67	455.63
135.0	572.20	546.21	527.19	512.34	499.81	489.14	479.86	471.50	467.33
180.0	570.81	543.89	520.23	506.31	497.03	487.28	478.93	471.97	465.47
225.0	562.18	537.63	518.84	504.78	493.08	483.85	476.28	469.56	465.52
270.0	645.05	598.19	563.85	539.72	521.16	506.31	493.78	484.03	475.22
315.0	587.93	555.17	532.43	521.62	506.40	487.84	480.97	471.09	462.87
360.0	602.69	566.21	539.76	519.53	503.80	490.90	479.95	470.81	462.36
C/ γ (°)	27.0	28.0	29.0	30.0	31.0	32.0	33.0	34.0	35.0
0.0	455.36	448.67	442.92	434.43	425.80	420.28	412.25	391.88	350.11
45.0	457.58	453.41	445.98	437.17	430.21	423.24	413.96	382.41	334.15
90.0	449.56	441.76	434.75	427.56	418.74	391.97	342.87	285.24	222.41
135.0	460.37	451.09	446.45	438.09	432.06	425.57	412.57	381.95	336.93
180.0	460.37	453.41	445.52	438.09	431.13	422.78	402.83	363.38	306.77
225.0	459.39	452.71	444.27	437.21	429.32	415.91	377.44	324.22	266.03
270.0	467.33	459.90	452.94	447.37	437.17	431.60	425.10	413.04	387.05
315.0	455.68	449.09	442.97	435.45	428.02	421.11	413.59	395.22	359.12
360.0	455.36	448.67	442.92	434.43	425.80	420.28	412.25	391.88	350.11
C/ γ (°)	36.0	37.0	38.0	39.0	40.0	41.0	42.0	43.0	44.0
0.0	290.90	222.78	152.76	89.37	43.39	18.28	12.20	8.63	6.87
45.0	276.61	252.48	240.88	109.23	57.82	21.90	13.22	9.19	7.19
90.0	158.75	98.84	48.12	25.75	12.71	8.12	6.82	5.20	4.92
135.0	272.90	242.27	160.37	55.27	24.04	12.62	8.91	6.91	5.57
180.0	239.02	239.02	170.16	62.97	17.96	11.55	8.82	6.50	5.06
225.0	206.03	146.40	90.07	42.60	14.94	10.44	7.56	5.85	4.83
270.0	337.40	279.39	242.27	242.27	92.81	43.85	16.15	11.18	7.98
315.0	304.03	226.45	143.71	82.04	48.17	17.82	11.74	9.00	6.50
360.0	290.90	222.78	152.76	89.37	43.39	18.28	12.20	8.63	6.87

Intensity data(cd)

C/ γ (°)	45.0	46.0	47.0	48.0	49.0	50.0	51.0	52.0	53.0
0.0	5.34	5.06	4.83	4.59	4.27	4.13	3.99	3.71	3.62
45.0	5.43	5.15	4.78	4.55	4.41	4.13	3.90	3.71	3.57
90.0	4.69	4.41	4.13	3.94	3.81	3.53	3.34	3.16	3.06
135.0	4.73	4.45	4.18	3.99	3.85	3.57	3.39	3.29	3.11
180.0	4.45	4.22	4.08	3.85	3.62	3.48	3.29	3.16	2.97
225.0	4.55	4.27	4.13	3.94	3.81	3.53	3.34	3.16	3.06
270.0	6.36	5.20	4.87	4.50	4.45	4.18	3.94	3.81	3.62
315.0	5.34	5.10	4.78	4.50	4.32	4.13	3.90	3.62	3.53
360.0	5.34	5.06	4.83	4.59	4.27	4.13	3.99	3.71	3.62
C/ γ (°)	54.0	55.0	56.0	57.0	58.0	59.0	60.0	61.0	62.0
0.0	3.43	3.20	3.11	2.92	2.74	2.64	2.60	2.46	2.27
45.0	3.34	3.16	3.06	2.92	2.69	2.60	2.55	2.41	2.27
90.0	2.88	2.74	2.64	2.60	2.46	2.32	2.23	2.18	2.04
135.0	2.92	2.78	2.74	2.55	2.41	2.37	2.32	2.18	2.18
180.0	2.83	2.78	2.60	2.51	2.41	2.27	2.27	2.04	2.00
225.0	2.88	2.69	2.60	2.55	2.41	2.32	2.18	2.18	2.09
270.0	3.39	3.25	3.16	2.97	2.78	2.69	2.64	2.46	2.32
315.0	3.39	3.20	2.97	2.88	2.78	2.64	2.46	2.37	2.32
360.0	3.43	3.20	3.11	2.92	2.74	2.64	2.60	2.46	2.27
C/ γ (°)	63.0	64.0	65.0	66.0	67.0	68.0	69.0	70.0	71.0
0.0	2.27	2.23	2.09	2.00	1.95	1.90	1.81	1.72	1.76
45.0	2.27	2.13	2.09	2.04	1.90	1.81	1.86	1.76	1.67
90.0	2.04	2.00	1.90	1.81	1.76	1.76	1.72	1.62	1.58
135.0	2.04	1.95	1.95	1.90	1.76	1.76	1.76	1.67	1.62
180.0	1.95	1.95	1.86	1.72	1.72	1.72	1.67	1.58	1.53
225.0	1.95	1.86	1.81	1.81	1.76	1.72	1.67	1.62	1.53
270.0	2.27	2.23	2.09	2.00	1.95	1.95	1.86	1.76	1.72
315.0	2.23	2.18	2.00	2.00	1.90	1.90	1.81	1.76	1.67
360.0	2.27	2.23	2.09	2.00	1.95	1.90	1.81	1.72	1.76
C/ γ (°)	72.0	73.0	74.0	75.0	76.0	77.0	78.0	79.0	80.0
0.0	1.67	1.62	1.62	1.53	1.53	1.58	1.53	1.44	1.48
45.0	1.62	1.67	1.62	1.53	1.53	1.53	1.48	1.53	1.44
90.0	1.58	1.58	1.53	1.44	1.48	1.48	1.44	1.39	1.39
135.0	1.58	1.62	1.53	1.48	1.53	1.53	1.44	1.44	1.48
180.0	1.53	1.48	1.48	1.48	1.48	1.44	1.48	1.39	1.35
225.0	1.58	1.58	1.48	1.44	1.48	1.48	1.44	1.39	1.35
270.0	1.72	1.72	1.58	1.58	1.58	1.53	1.44	1.44	1.48
315.0	1.67	1.67	1.58	1.53	1.53	1.58	1.48	1.44	1.39
360.0	1.67	1.62	1.62	1.53	1.53	1.58	1.53	1.44	1.48
C/ γ (°)	81.0	82.0	83.0	84.0	85.0	86.0	87.0	88.0	89.0
0.0	1.48	1.44	1.44	1.39	1.39	1.35	1.35	1.30	1.25
45.0	1.39	1.39	1.44	1.35	1.30	1.35	1.35	1.35	1.35
90.0	1.39	1.39	1.39	1.30	1.39	1.39	1.30	1.30	1.48
135.0	1.44	1.39	1.44	1.39	1.35	1.35	1.35	1.35	1.39
180.0	1.35	1.30	1.30	1.35	1.30	1.35	1.35	1.35	1.30
225.0	1.39	1.35	1.35	1.30	1.35	1.30	1.30	1.30	1.30
270.0	1.44	1.39	1.39	1.39	1.30	1.30	1.30	1.30	1.25
315.0	1.44	1.44	1.39	1.35	1.39	1.35	1.35	1.35	1.35
360.0	1.48	1.44	1.44	1.39	1.39	1.35	1.35	1.30	1.25

Intensity data(cd)

Appendix Page: 19 Total:19

C/ $\gamma(^{\circ})$	90.0
0.0	1.30
45.0	1.48
90.0	1.58
135.0	1.30
180.0	1.35
225.0	1.35
270.0	1.30
315.0	1.35
360.0	1.30