
NATA

Client:

LumCAT: 4-2275-M

Luminaire: 92.70.135.00

Report No: NT2018010520

Test No: GC2018010520

LampCAT: BXRV-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): 19.2600

PF: 0.9190

Ballast type: AC

Width(mm): 100

Height(mm): 0

Photometric Results

Lumens(lm): 1217.32, Efficiency(%): 89.84% , Luminous Efficacy(lm/W): 63.20

Central intensity(cd): 6383.058, Maximum intensity(cd): 6383.058

Angle of maximum intensity: C=0.0 γ =0.0

Beam Angle(50%Imax): [C0/180]Total=18.8

[C90/270]Total=18.8

Field angle(10%Imax): [C0/180]Total=39.8

[C90/270]Total=39.8

Maximum s/h(1/2): C0_180=0.32 C90_270=0.32

Maximum s/h(1/4): C0_180=0.33 C90_270=0.33

Up flux rate of lamp(%): 0.00%

Down flux rate of lamp(%): 89.95%

Up flux rate of LUM(%): - -

Down flux rate of LUM(%): 100.00%

CIE Type : Direct lighting

Output flux ratio in π solid angle : 99.472%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
0.0	6383.058	1.527	1.527	.113%	.125%
1.0	6337.467	12.129	13.656	.895%	1.122%
2.0	6224.301	23.821	37.477	1.758%	3.079%
3.0	6007.945	34.481	71.958	2.545%	5.911%
4.0	5725.697	43.799	115.757	3.232%	9.509%
5.0	5351.860	51.151	166.908	3.775%	13.711%
6.0	4909.984	56.282	223.189	4.154%	18.335%
7.0	4429.188	59.193	282.382	4.368%	23.197%
8.0	3915.851	59.763	342.146	4.411%	28.107%
9.0	3406.980	58.446	400.591	4.313%	32.908%
10.0	2920.789	55.619	456.21	4.105%	37.477%
11.0	2486.048	52.019	508.229	3.839%	41.750%
12.0	2107.338	48.047	556.276	3.546%	45.697%
13.0	1776.308	43.819	600.094	3.234%	49.296%
14.0	1490.696	39.547	639.642	2.919%	52.545%
15.0	1259.839	35.757	675.399	2.639%	55.483%
16.0	1048.240	31.685	707.084	2.338%	58.085%
17.0	918.345	29.444	736.527	2.173%	60.504%
18.0	826.728	28.015	764.543	2.068%	62.806%
19.0	717.419	25.613	790.156	1.890%	64.910%
20.0	631.236	23.675	813.831	1.747%	66.854%
21.0	572.617	22.503	836.335	1.661%	68.703%
22.0	527.020	21.650	857.984	1.598%	70.482%
23.0	497.827	21.331	879.315	1.574%	72.234%
24.0	481.301	21.468	900.783	1.584%	73.997%
25.0	469.909	21.778	922.561	1.607%	75.786%
26.0	461.006	22.162	944.722	1.636%	77.607%
27.0	453.610	22.583	967.305	1.667%	79.462%
28.0	446.818	23.003	990.308	1.698%	81.352%
29.0	439.654	23.374	1013.683	1.725%	83.272%
30.0	432.688	23.724	1037.407	1.751%	85.221%
31.0	425.240	24.017	1061.424	1.772%	87.194%
32.0	416.737	24.217	1085.642	1.787%	89.183%
33.0	402.160	24.019	1109.661	1.773%	91.156%
34.0	369.452	22.655	1132.316	1.672%	93.017%
35.0	326.500	20.536	1152.853	1.516%	94.704%
36.0	267.092	17.216	1170.069	1.271%	96.119%
37.0	220.955	14.582	1184.651	1.076%	97.316%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
38.0	170.016	11.478	1196.129	.847%	98.259%
39.0	91.084	6.286	1202.415	.464%	98.776%
40.0	41.734	2.942	1205.357	.217%	99.017%
41.0	19.652	1.414	1206.771	.104%	99.134%
42.0	10.400	0.763	1207.534	.056%	99.196%
43.0	6.902	0.516	1208.05	.038%	99.239%
44.0	5.070	0.386	1208.436	.029%	99.270%
45.0	4.020	0.312	1208.748	.023%	99.296%
46.0	3.625	0.286	1209.034	.021%	99.320%
47.0	3.399	0.273	1209.306	.020%	99.342%
48.0	3.283	0.268	1209.574	.020%	99.364%
49.0	3.155	0.261	1209.835	.019%	99.385%
50.0	3.005	0.252	1210.088	.019%	99.406%
51.0	2.889	0.246	1210.334	.018%	99.426%
52.0	2.831	0.245	1210.578	.018%	99.446%
53.0	2.732	0.239	1210.818	.018%	99.466%
54.0	2.639	0.234	1211.052	.017%	99.485%
55.0	2.546	0.229	1211.28	.017%	99.504%
56.0	2.471	0.225	1211.505	.017%	99.523%
57.0	2.384	0.219	1211.724	.016%	99.541%
58.0	2.332	0.217	1211.941	.016%	99.558%
59.0	2.251	0.212	1212.153	.016%	99.576%
60.0	2.193	0.208	1212.361	.015%	99.593%
61.0	2.129	0.204	1212.565	.015%	99.610%
62.0	2.082	0.202	1212.767	.015%	99.626%
63.0	2.036	0.199	1212.966	.015%	99.643%
64.0	1.955	0.193	1213.158	.014%	99.658%
65.0	1.897	0.189	1213.347	.014%	99.674%
66.0	1.885	0.189	1213.536	.014%	99.689%
67.0	1.833	0.185	1213.721	.014%	99.705%
68.0	1.758	0.179	1213.899	.013%	99.719%
69.0	1.734	0.178	1214.077	.013%	99.734%
70.0	1.717	0.177	1214.254	.013%	99.748%
71.0	1.688	0.175	1214.429	.013%	99.763%
72.0	1.630	0.170	1214.599	.013%	99.777%
73.0	1.589	0.167	1214.766	.012%	99.790%
74.0	1.584	0.167	1214.933	.012%	99.804%
75.0	1.566	0.166	1215.098	.012%	99.818%

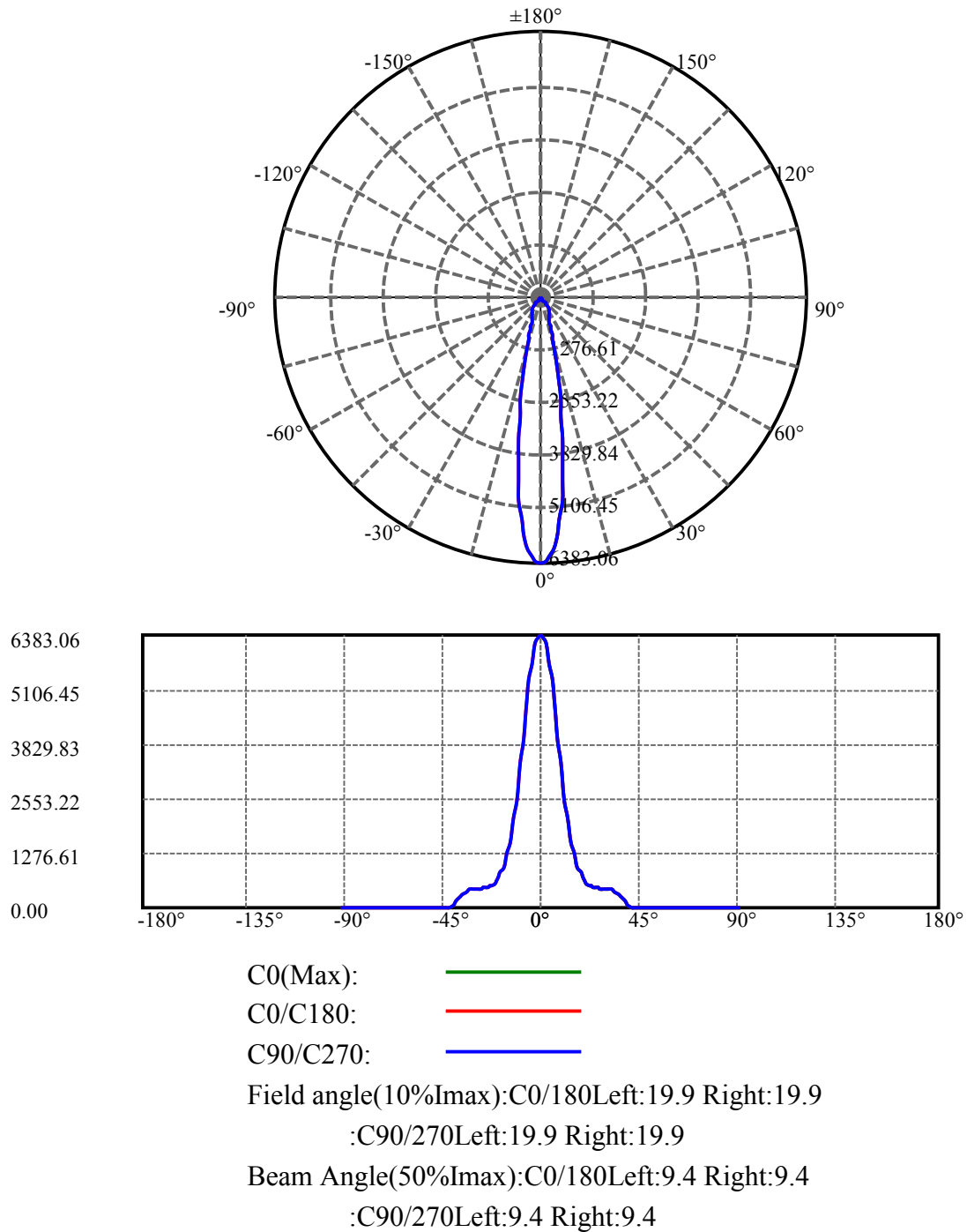
$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
76.0	1.531	0.163	1215.261	.012%	99.831%
77.0	1.485	0.159	1215.42	.012%	99.844%
78.0	1.485	0.159	1215.579	.012%	99.857%
79.0	1.479	0.159	1215.739	.012%	99.870%
80.0	1.427	0.154	1215.893	.011%	99.883%
81.0	1.392	0.151	1216.043	.011%	99.895%
82.0	1.404	0.152	1216.196	.011%	99.908%
83.0	1.375	0.150	1216.345	.011%	99.920%
84.0	1.369	0.149	1216.495	.011%	99.932%
85.0	1.375	0.150	1216.645	.011%	99.945%
86.0	1.334	0.146	1216.791	.011%	99.957%
87.0	1.346	0.147	1216.938	.011%	99.969%
88.0	1.375	0.151	1217.089	.011%	99.981%
89.0	1.369	0.150	1217.239	.011%	99.994%
90.0	1.433	0.079	1217.318	.006%	100.000%

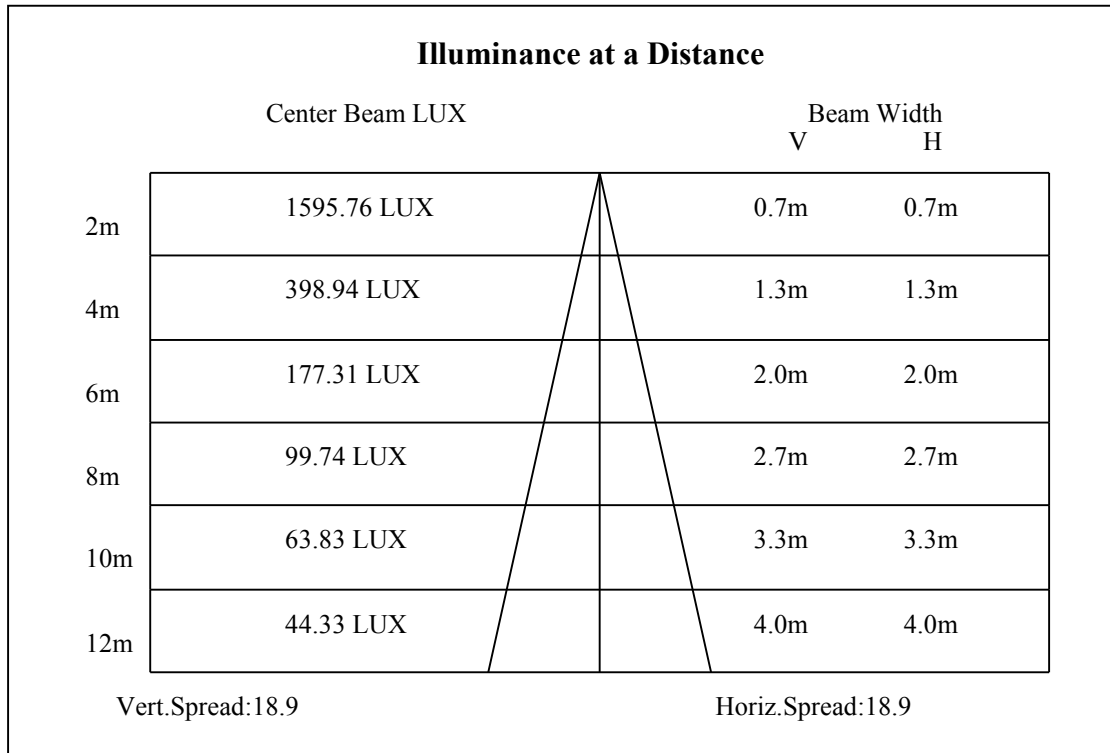
ZONAL LUMEN SUMMARY

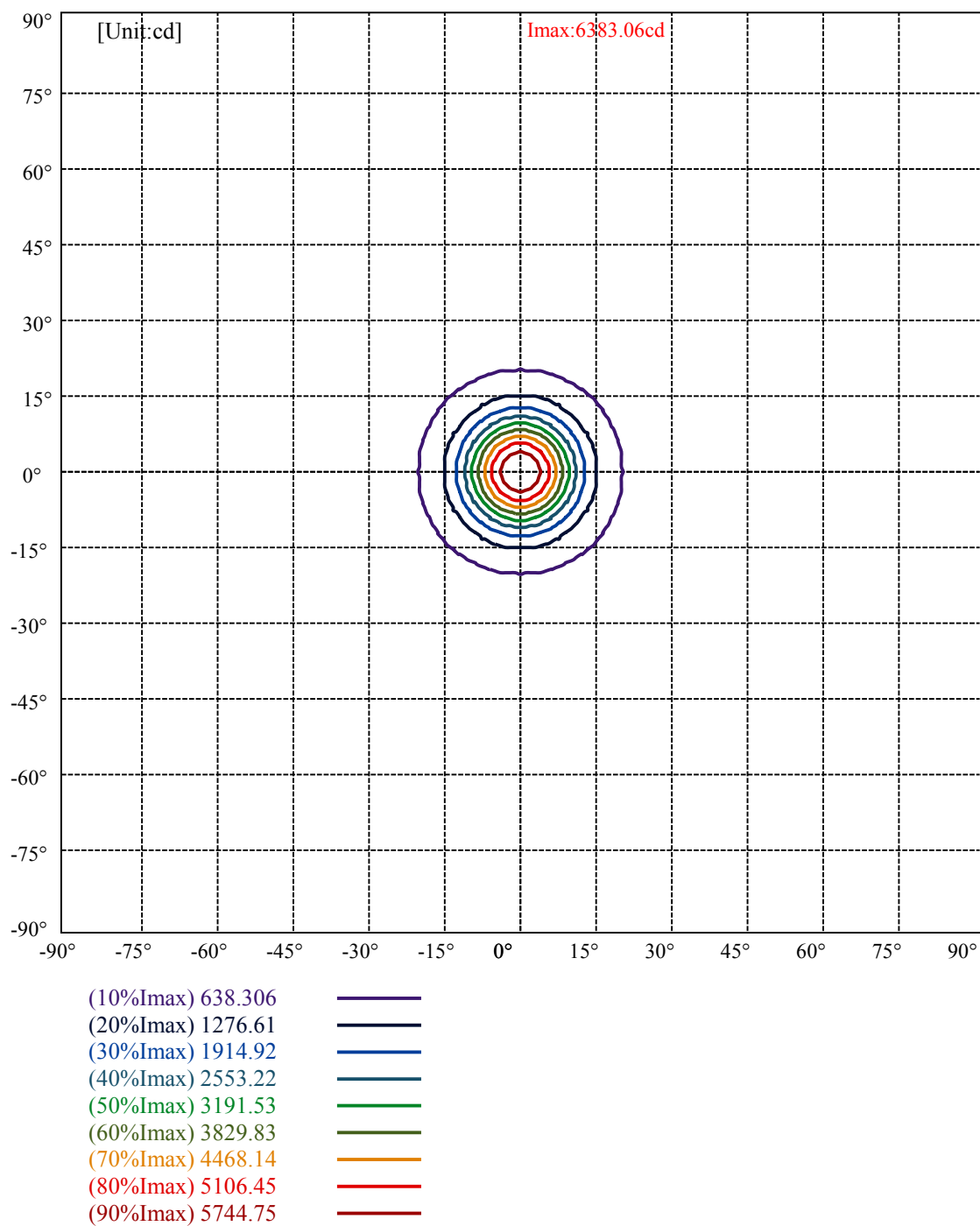
Zone	Lumens	%Lamp	%Fixt
0-30	1037.41	76.56%	85.22%
0-40	1205.36	88.96%	99.02%
0-60	1212.36	89.47%	99.59%
0-90	1217.24	89.83%	99.99%
0-120	1217.24	89.83%	99.99%
0-180	1217.32	89.84%	100.00%
60-90	5.09	0.38%	0.42%
90-120	0.00	0.00%	0.00%
90-130	0.00	0.00%	0.00%
90-150	0.00	0.00%	0.00%
90-180	0.00	0.00%	0.00%
0-27.28	973.85	71.87%	80.00%

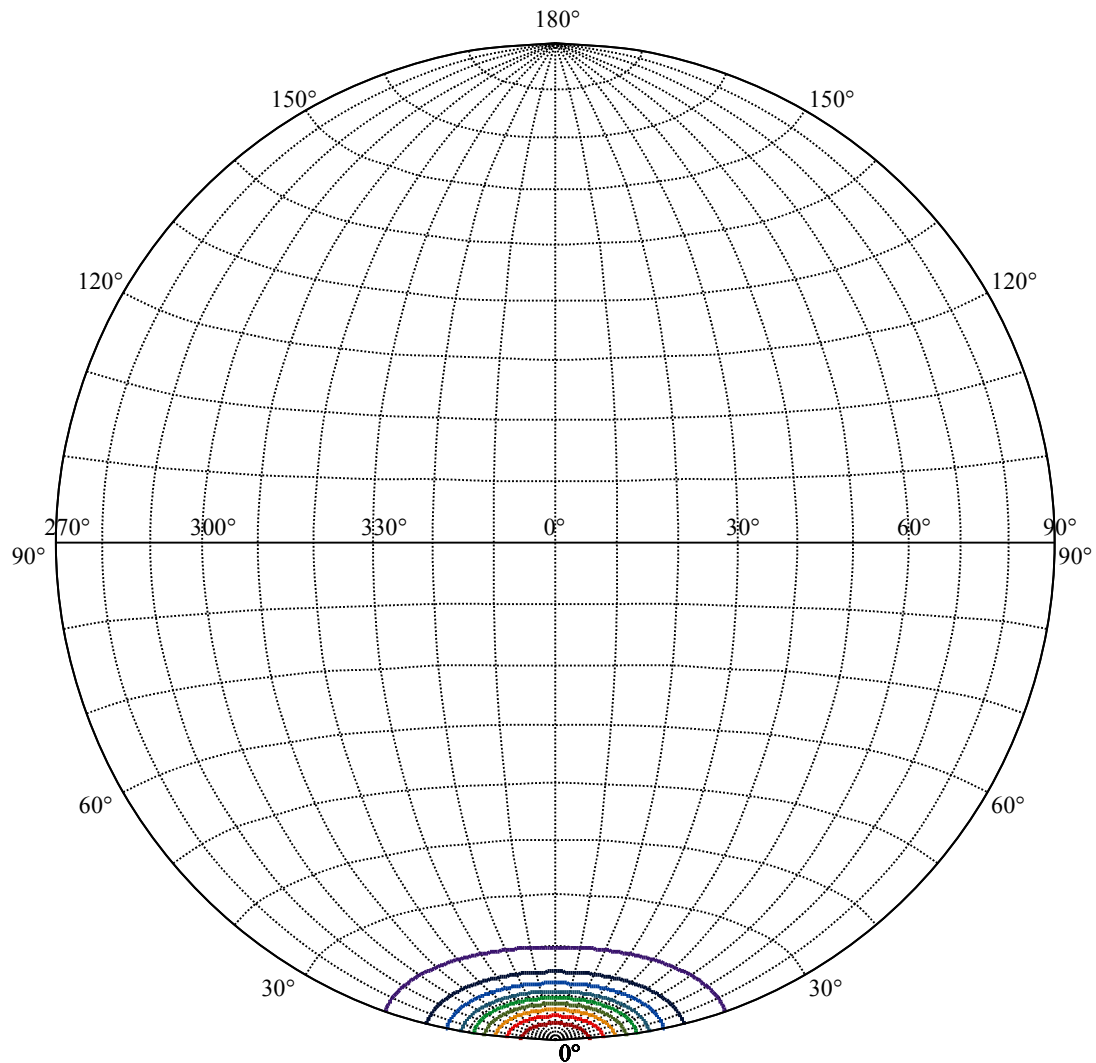
ZONAL LUMEN SUMMARY

0-10	456.21
10-20	357.62
20-30	223.58
30-40	167.95
40-50	4.73
50-60	2.27
60-70	1.89
70-80	1.64
80-90	1.35
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









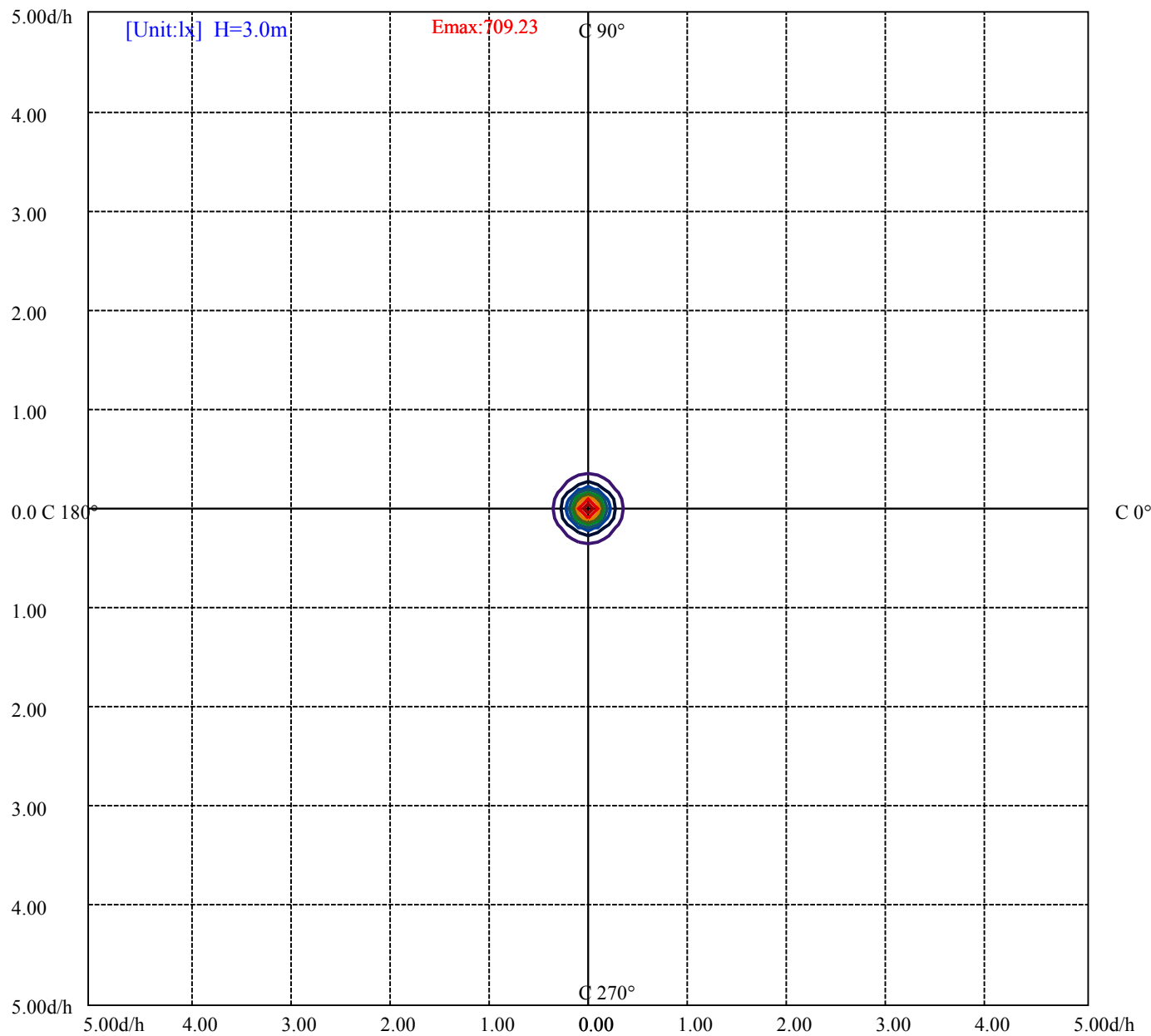
House

[Unit:cd]

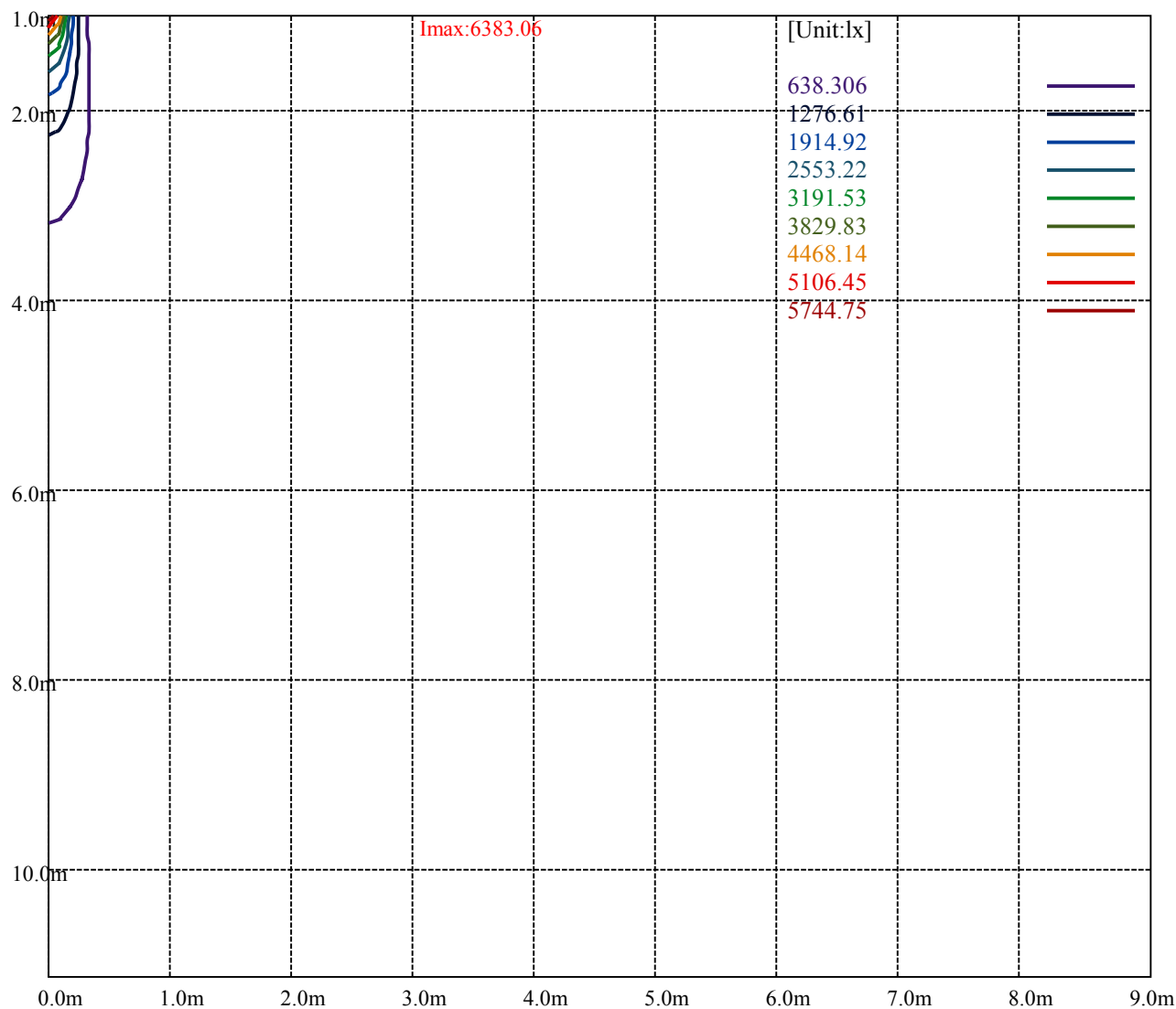
Road

Imax:6383.06

(10%Imax)	638.306	—
(20%Imax)	1276.61	—
(30%Imax)	1914.92	—
(40%Imax)	2553.22	—
(50%Imax)	3191.53	—
(60%Imax)	3829.83	—
(70%Imax)	4468.14	—
(80%Imax)	5106.45	—
(90%Imax)	5744.75	—



(10%Emax)	70.92278	
(20%Emax)	141.8456	
(30%Emax)	212.7689	
(40%Emax)	283.6911	
(50%Emax)	354.6144	
(60%Emax)	425.5367	
(70%Emax)	496.46	
(80%Emax)	567.3822	
(90%Emax)	638.3055	



Luminance Table

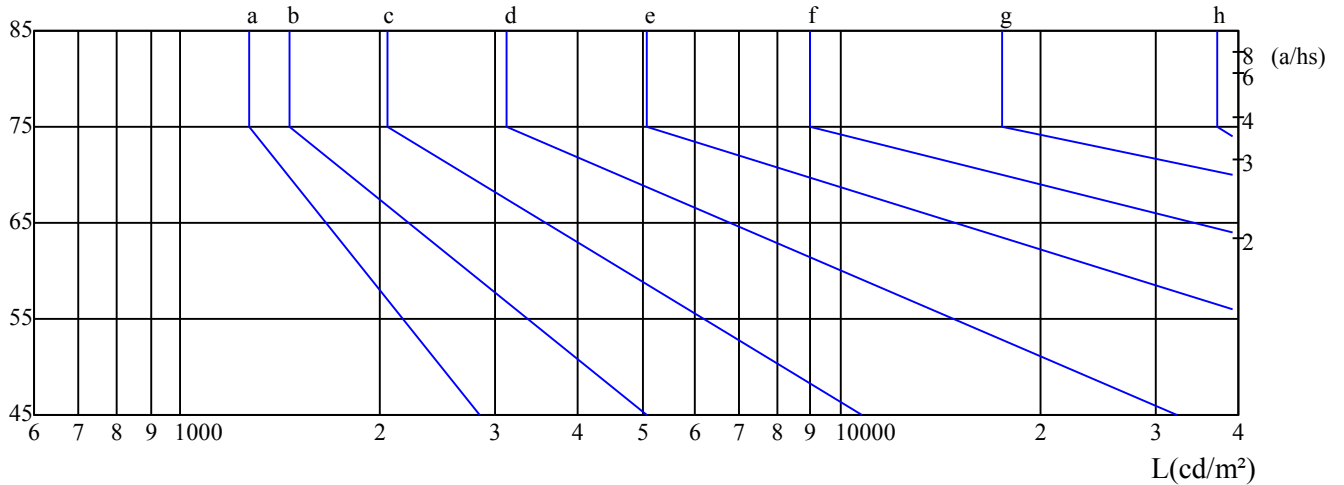
γ	45	50	55	60	65	70	75	80	85
C0	340	260	227	203	184	177	173	171	182
C45	292	220	189	166	148	139	133	129	133
C90	340	260	227	203	184	177	173	171	182

L(Hor)(65)	L(Ver)(65)	L45(65)	L(Hor)(75)	L(Ver)(75)	L45(75)	L(Hor)(85)	L(Ver)(85)	L45(85)
449	449	449	605	605	605	1577	1577	1577

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

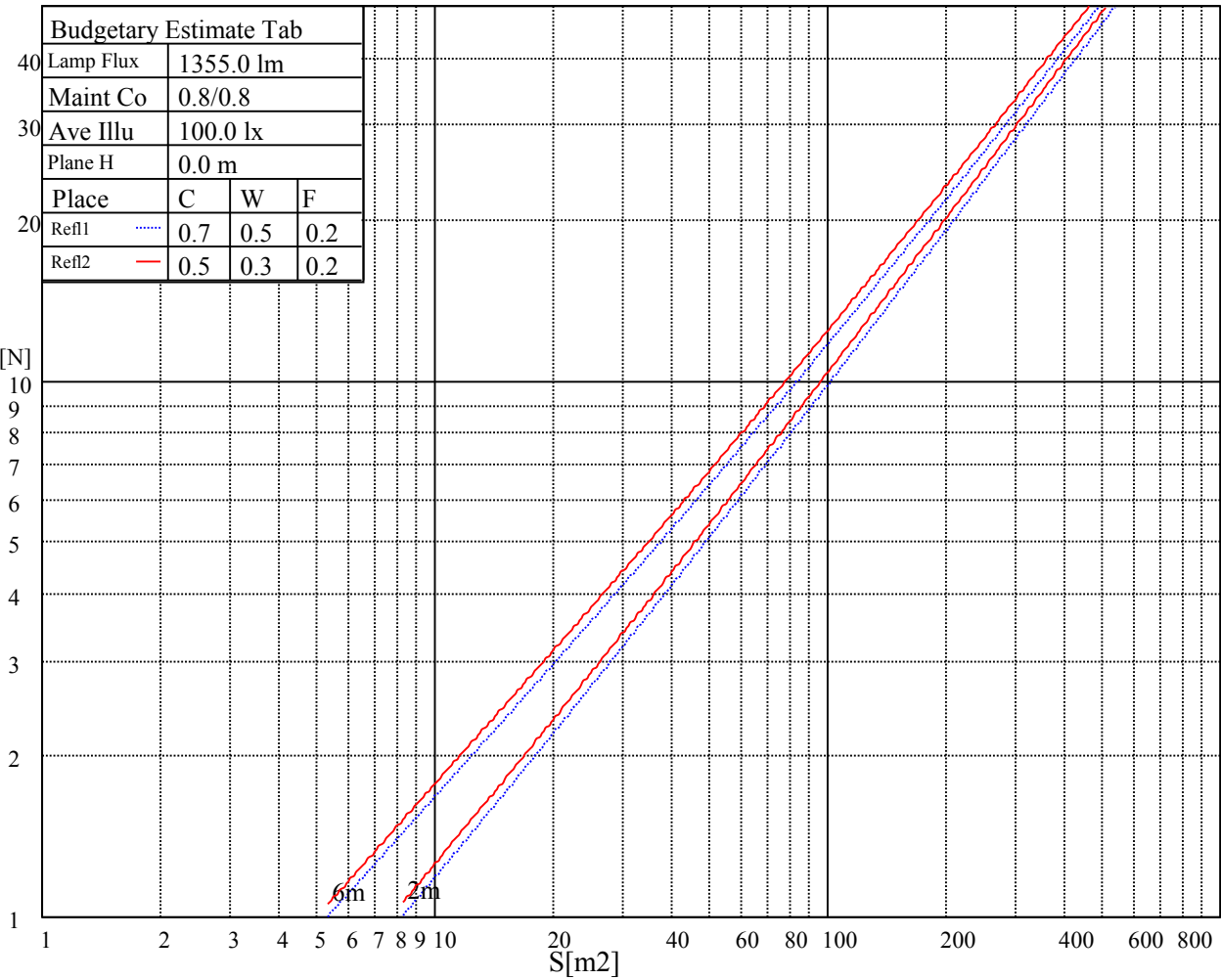
Luminance Limiting Curve

 $\gamma(^{\circ})$ 

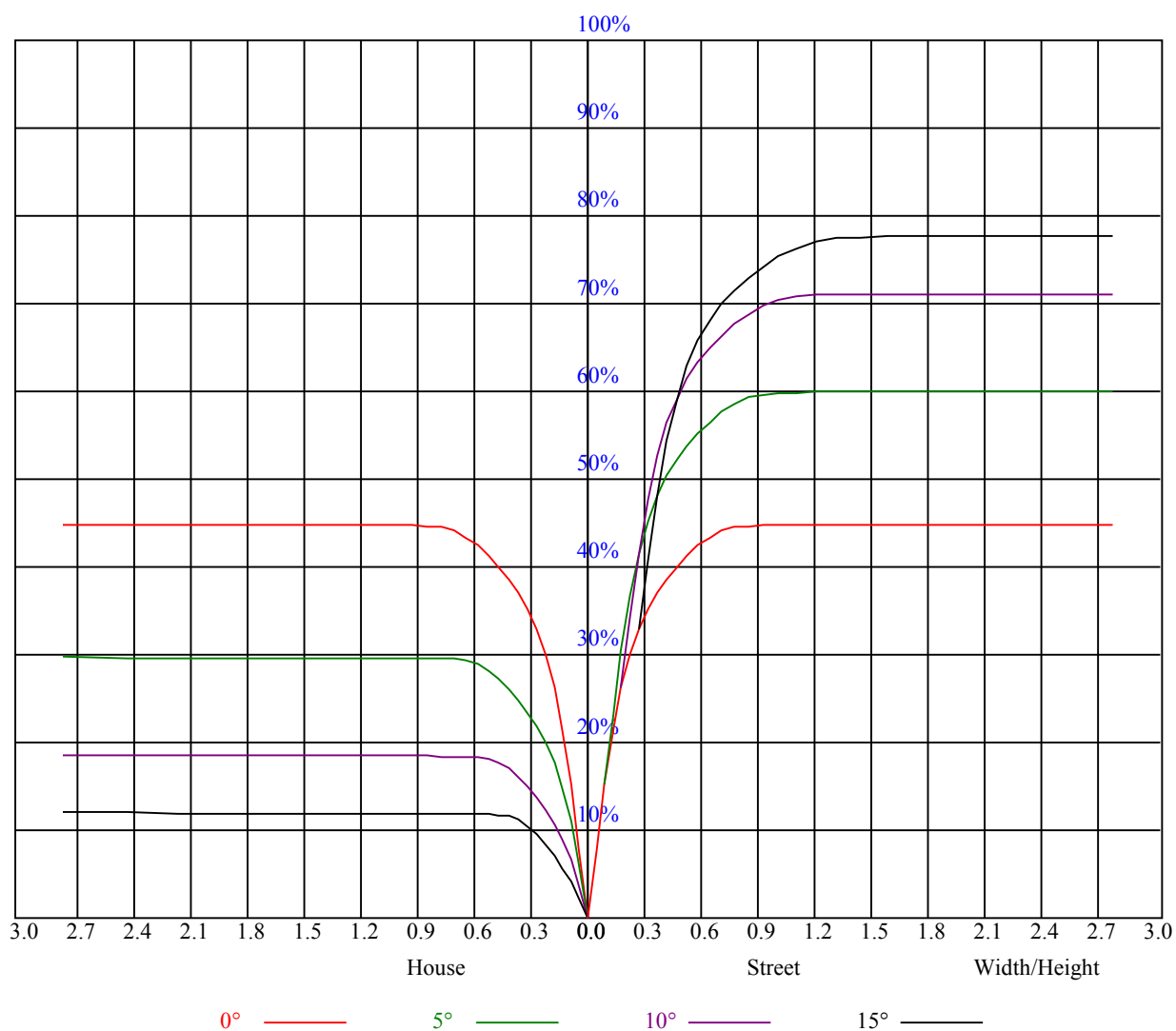
C0 ———

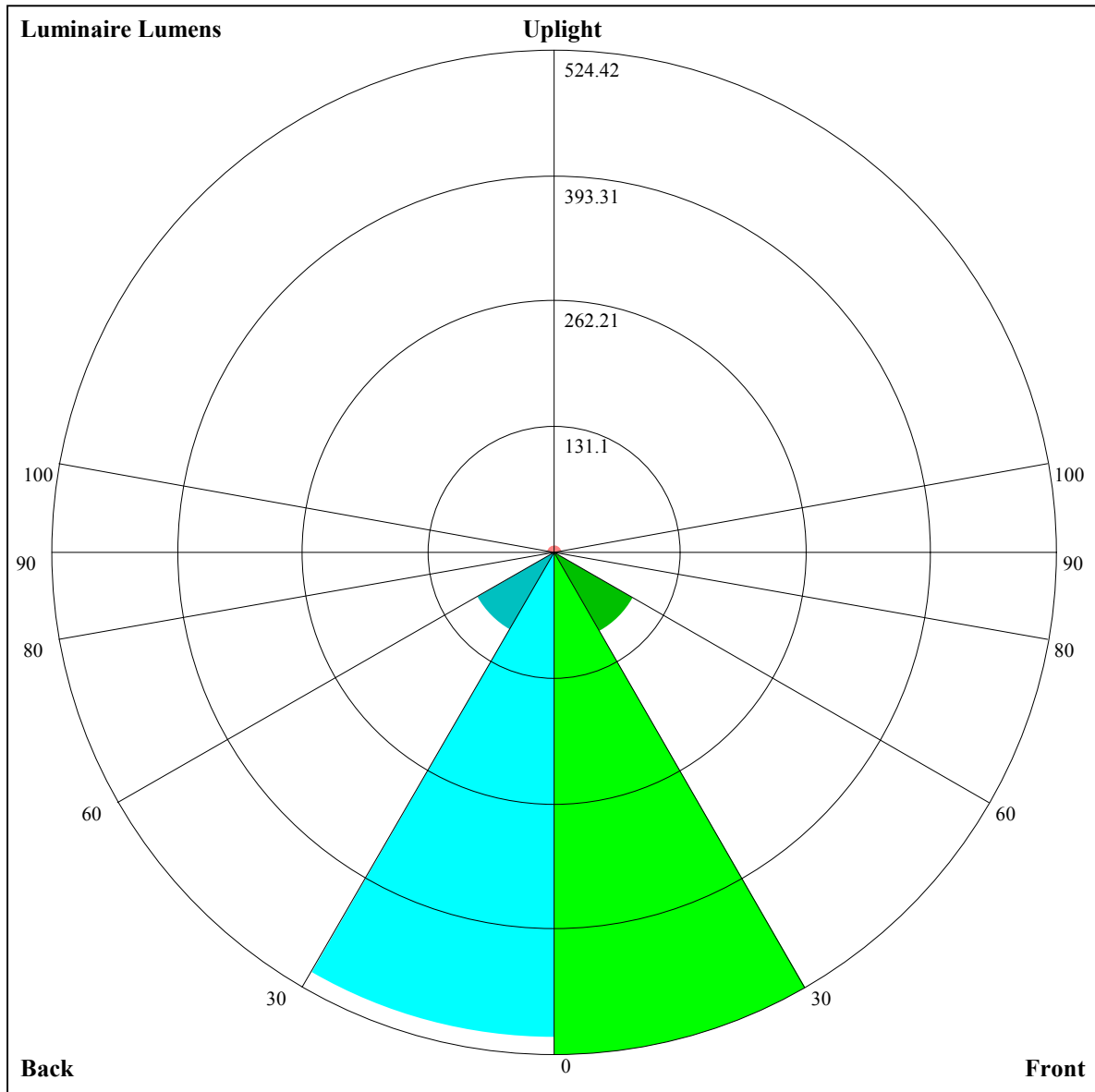
C45 ———

C90 ———



RHOC	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	1.07	1.07	1.07	1.05	1.05	1.05	1.00	1.00	1.00	0.96	0.96	0.96	0.92	0.92	0.92	0.90
1	1.01	0.99	0.97	0.99	0.97	0.96	0.95	0.94	0.93	0.92	0.91	0.90	0.89	0.88	0.88	0.86
2	0.96	0.93	0.90	0.94	0.92	0.89	0.92	0.89	0.88	0.89	0.87	0.86	0.87	0.85	0.84	0.83
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	0.83	0.81	0.86	0.83	0.80	0.85	0.82	0.79	0.83	0.80	0.78	0.81	0.79	0.77	0.76
5	0.84	0.80	0.77	0.83	0.79	0.76	0.81	0.78	0.76	0.80	0.77	0.75	0.79	0.76	0.75	0.73
6	0.80	0.76	0.73	0.80	0.76	0.73	0.79	0.75	0.73	0.77	0.75	0.72	0.76	0.74	0.72	0.71
7	0.78	0.73	0.71	0.77	0.73	0.70	0.76	0.73	0.70	0.75	0.72	0.70	0.74	0.71	0.69	0.68
8	0.75	0.71	0.68	0.74	0.71	0.68	0.74	0.70	0.68	0.73	0.70	0.67	0.72	0.69	0.67	0.66
9	0.72	0.68	0.66	0.72	0.68	0.66	0.71	0.68	0.65	0.71	0.67	0.65	0.70	0.67	0.65	0.64
10	0.70	0.66	0.64	0.70	0.66	0.64	0.69	0.66	0.63	0.69	0.66	0.63	0.68	0.65	0.63	0.62





Luminaire Lumens:

FL=524.42,FM=94.64,FH=1.79,FVH=0.76

BL=505.92,BM=92.74,BH=1.77,BVH=0.76

UL=1.56,UH=7.44

BUG Rating:B2-U1-G0

NATA 4-2275-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	6380.97	6353.13	6242.22	6035.27	5743.39	5370.31	4923.91	4415.32	3886.79		
45.0	6359.16	6356.84	6300.69	6130.39	5871.93	5543.39	5147.11	4688.64	4188.88		
90.0	6345.70	6177.72	5909.51	5559.63	5150.35	4685.86	4176.81	3650.60	3129.49		
135.0	6446.40	6357.30	6194.89	6049.19	5734.57	5345.25	4874.25	4348.97	3813.94		
180.0	6380.97	6329.46	6195.36	5962.41	5644.55	5253.83	4791.66	4277.97	3747.58		
225.0	6359.16	6263.11	6156.38	5775.41	5570.77	5181.44	4733.65	4240.38	3729.95		
270.0	6345.70	6419.95	6417.16	6334.10	6150.81	5879.35	5535.97	5211.61	4748.04		
315.0	6446.40	6442.22	6378.19	6217.17	5939.21	5555.45	5096.53	4600.01	4082.15		
360.0	6380.97	6353.13	6242.22	6035.27	5743.39	5370.31	4923.91	4415.32	3886.79		
C/γ(°)	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0		
0.0	3372.18	2881.23	2606.52	2197.24	1852.93	1565.70	1333.21	925.19	870.06		
45.0	3677.05	3167.54	2686.34	2258.03	1897.02	1592.61	1341.57	1136.46	971.73		
90.0	2646.43	2224.62	1871.96	1576.83	1336.00	1054.33	903.52	903.52	783.20		
135.0	3296.08	2810.70	2370.33	1997.25	1686.34	1432.98	1228.81	1059.90	918.37		
180.0	3235.75	2759.19	2333.21	1968.01	1659.89	1409.78	1243.19	1039.48	925.33		
225.0	3222.29	2737.84	2305.83	1935.99	1623.70	1367.09	1062.22	880.46	831.50		
270.0	4243.63	3722.52	3111.85	2726.24	2294.69	1927.18	1622.31	1372.19	1163.84		
315.0	3562.43	3062.67	2602.35	2199.10	1859.89	1575.90	1343.89	1068.72	882.73		
360.0	3372.18	2881.23	2606.52	2197.24	1852.93	1565.70	1333.21	925.19	870.06		
C/γ(°)	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0	26.0		
0.0	844.22	729.32	635.73	565.47	519.67	496.79	477.26	468.02	458.23		
45.0	837.16	729.04	642.27	598.65	542.50	497.03	486.35	472.90	462.69		
90.0	684.77	606.31	547.93	511.64	489.74	476.19	465.94	457.54	450.62		
135.0	844.59	695.63	614.89	575.91	529.51	501.20	484.03	472.43	464.08		
180.0	805.14	701.66	620.00	560.13	519.76	494.71	480.32	470.11	462.69		
225.0	725.38	672.01	600.41	548.12	512.25	490.85	478.19	468.35	460.60		
270.0	989.83	845.98	731.83	641.34	574.52	528.58	498.88	482.18	470.58		
315.0	882.73	759.39	656.84	579.67	528.21	497.26	479.44	467.75	458.56		
360.0	844.22	729.32	635.73	565.47	519.67	496.79	477.26	468.02	458.23		
C/γ(°)	27.0	28.0	29.0	30.0	31.0	32.0	33.0	34.0	35.0		
0.0	450.02	442.92	436.61	428.44	421.85	415.22	406.68	383.15	338.47		
45.0	454.34	446.91	440.88	432.53	425.10	418.60	411.18	388.91	345.75		
90.0	445.47	436.56	429.51	424.08	415.08	393.73	359.07	304.08	243.39		
135.0	456.66	449.69	443.20	435.31	428.81	421.85	407.47	375.45	329.05		
180.0	455.26	449.23	441.81	434.85	428.81	420.92	411.18	361.53	329.51		
225.0	453.92	447.84	440.09	433.13	426.86	418.88	392.39	344.59	288.35		
270.0	462.22	457.12	447.37	443.66	432.53	428.81	422.32	415.36	395.87		
315.0	450.99	444.27	437.77	429.51	422.87	415.87	407.00	382.55	341.62		
360.0	450.02	442.92	436.61	428.44	421.85	415.22	406.68	383.15	338.47		
C/γ(°)	36.0	37.0	38.0	39.0	40.0	41.0	42.0	43.0	44.0		
0.0	277.54	208.72	139.12	77.82	35.59	14.29	9.61	6.31	4.92		
45.0	290.53	243.66	243.66	123.48	50.90	27.52	11.69	7.89	5.48		
90.0	179.95	118.05	63.06	22.97	10.49	7.52	5.15	3.81	3.62		
135.0	263.62	263.62	232.53	58.28	25.24	10.67	8.12	5.80	4.55		
180.0	265.94	237.63	168.72	61.81	25.75	10.86	8.31	5.99	4.22		
225.0	228.81	169.37	133.92	59.21	34.48	12.48	9.37	6.73	4.36		
270.0	351.78	295.64	258.98	258.98	108.35	56.10	20.32	11.23	7.98		
315.0	278.56	230.95	120.14	66.12	43.06	17.77	10.63	7.47	5.43		
360.0	277.54	208.72	139.12	77.82	35.59	14.29	9.61	6.31	4.92		

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	3.85	3.57	3.39	3.29	3.20	3.06	2.88	2.88	2.74
45.0	3.90	3.57	3.48	3.34	3.16	3.02	2.92	2.88	2.78
90.0	3.48	3.29	3.11	3.06	2.97	2.83	2.69	2.64	2.64
135.0	3.71	3.53	3.43	3.29	3.11	2.97	2.92	2.83	2.69
180.0	3.67	3.53	3.39	3.20	3.06	2.97	2.88	2.74	2.64
225.0	3.71	3.53	3.29	3.20	3.11	2.97	2.83	2.78	2.69
270.0	5.99	4.41	3.67	3.53	3.43	3.20	3.06	3.02	2.92
315.0	3.85	3.57	3.43	3.34	3.20	3.02	2.92	2.88	2.74
360.0	3.85	3.57	3.39	3.29	3.20	3.06	2.88	2.88	2.74
C/ γ (°)	54.0	55.0	56.0	57.0	58.0	59.0	60.0	61.0	62.0
0.0	2.69	2.60	2.51	2.37	2.32	2.27	2.27	2.13	2.09
45.0	2.60	2.55	2.55	2.46	2.32	2.32	2.23	2.18	2.13
90.0	2.55	2.46	2.37	2.27	2.27	2.18	2.09	2.04	2.04
135.0	2.69	2.55	2.46	2.41	2.41	2.27	2.18	2.13	2.04
180.0	2.60	2.51	2.41	2.32	2.27	2.27	2.13	2.04	2.04
225.0	2.55	2.46	2.37	2.32	2.27	2.13	2.13	2.09	2.09
270.0	2.78	2.64	2.60	2.55	2.46	2.32	2.32	2.27	2.13
315.0	2.64	2.60	2.51	2.37	2.32	2.23	2.18	2.13	2.09
360.0	2.69	2.60	2.51	2.37	2.32	2.27	2.27	2.13	2.09
C/ γ (°)	63.0	64.0	65.0	66.0	67.0	68.0	69.0	70.0	71.0
0.0	2.04	2.04	1.90	1.86	1.86	1.76	1.76	1.67	1.67
45.0	2.04	1.95	1.95	1.95	1.86	1.76	1.76	1.81	1.67
90.0	2.00	1.86	1.86	1.86	1.76	1.67	1.72	1.72	1.62
135.0	2.09	1.95	1.90	1.90	1.86	1.76	1.72	1.72	1.76
180.0	2.04	1.90	1.86	1.86	1.81	1.72	1.72	1.67	1.67
225.0	2.00	1.90	1.81	1.86	1.81	1.72	1.72	1.72	1.62
270.0	2.04	2.04	2.00	1.95	1.86	1.86	1.76	1.76	1.81
315.0	2.04	2.00	1.90	1.86	1.86	1.81	1.72	1.67	1.67
360.0	2.04	2.04	1.90	1.86	1.86	1.76	1.76	1.67	1.67
C/ γ (°)	72.0	73.0	74.0	75.0	76.0	77.0	78.0	79.0	80.0
0.0	1.62	1.62	1.62	1.58	1.48	1.48	1.53	1.48	1.39
45.0	1.67	1.67	1.62	1.53	1.53	1.53	1.53	1.48	1.44
90.0	1.58	1.53	1.58	1.58	1.53	1.48	1.44	1.48	1.44
135.0	1.62	1.58	1.58	1.58	1.58	1.44	1.44	1.48	1.44
180.0	1.58	1.58	1.53	1.53	1.58	1.48	1.48	1.48	1.44
225.0	1.58	1.58	1.58	1.53	1.48	1.48	1.48	1.44	1.35
270.0	1.72	1.62	1.58	1.62	1.58	1.48	1.48	1.48	1.48
315.0	1.67	1.53	1.58	1.58	1.48	1.48	1.48	1.48	1.44
360.0	1.62	1.62	1.62	1.58	1.48	1.48	1.53	1.48	1.39
C/ γ (°)	81.0	82.0	83.0	84.0	85.0	86.0	87.0	88.0	89.0
0.0	1.39	1.35	1.35	1.35	1.39	1.35	1.30	1.39	1.35
45.0	1.39	1.44	1.39	1.39	1.39	1.39	1.39	1.39	1.35
90.0	1.35	1.39	1.35	1.35	1.39	1.30	1.35	1.48	1.62
135.0	1.44	1.39	1.44	1.39	1.39	1.35	1.35	1.35	1.39
180.0	1.44	1.39	1.35	1.39	1.30	1.35	1.35	1.35	1.35
225.0	1.39	1.44	1.39	1.35	1.39	1.30	1.35	1.35	1.25
270.0	1.39	1.39	1.35	1.39	1.35	1.35	1.39	1.35	1.35
315.0	1.35	1.44	1.39	1.35	1.39	1.30	1.30	1.35	1.30
360.0	1.39	1.35	1.35	1.35	1.39	1.35	1.30	1.39	1.35

Intensity data(cd)

Appendix Page: 19 Total:19

C/ γ (°)	90.0
0.0	1.35
45.0	1.53
90.0	1.81
135.0	1.39
180.0	1.35
225.0	1.39
270.0	1.25
315.0	1.39
360.0	1.35