
NATA

Client:

LumCAT: 2-1676-M

Luminaire: 92.70.135.00

Report No: NT2018010512

Test No: GC2018010512

LampCAT: BXRV-DR-1830-H-3000-A-13

Lamp flux(lm): 1355.0

Number of Lamps: 1

Length(mm): 70

Phm Type: C

Voltage(V): 220.3000

Current(A): 0.0950

Power (W): 19.3000

PF: 0.9200

Ballast type: AC

Width(mm): 70

Height(mm): 0

Photometric Results

Lumens(lm): 1221.80, Efficiency(%): 90.17% , Luminous Efficacy(lm/W): 63.31

Central intensity(cd): 2550.490, Maximum intensity(cd): 2550.490

Angle of maximum intensity: C=0.0 γ =0.0

Beam Angle(50%Imax): [C0/180]Total=37.2

[C90/270]Total=37.2

Field angle(10%Imax): [C0/180]Total=73.2

[C90/270]Total=73.2

Maximum s/h(1/2): C0_180=0.61 C90_270=0.61

Maximum s/h(1/4): C0_180=0.60 C90_270=0.60

Up flux rate of lamp(%): 0.00%

Down flux rate of lamp(%): 90.21%

Up flux rate of LUM(%): - -

Down flux rate of LUM(%): 100.00%

CIE Type : Direct lighting

Output flux ratio in π solid angle : 99.450%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
0.0	2550.490	0.610	0.61	.045%	.050%
1.0	2546.488	4.874	5.484	.360%	.449%
2.0	2533.611	9.696	15.18	.716%	1.242%
3.0	2509.481	14.402	29.583	1.063%	2.421%
4.0	2481.465	18.982	48.565	1.401%	3.975%
5.0	2444.981	23.368	71.933	1.725%	5.887%
6.0	2398.983	27.499	99.432	2.029%	8.138%
7.0	2352.870	31.444	130.876	2.321%	10.712%
8.0	2296.316	35.046	165.922	2.586%	13.580%
9.0	2232.337	38.295	204.217	2.826%	16.714%
10.0	2159.658	41.125	245.342	3.035%	20.080%
11.0	2080.714	43.537	288.88	3.213%	23.644%
12.0	1994.114	45.465	334.345	3.355%	27.365%
13.0	1893.651	46.713	381.058	3.447%	31.188%
14.0	1798.582	47.715	428.774	3.521%	35.094%
15.0	1699.975	48.249	477.023	3.561%	39.043%
16.0	1582.168	47.824	524.846	3.529%	42.957%
17.0	1459.664	46.799	571.646	3.454%	46.787%
18.0	1353.110	45.853	617.499	3.384%	50.540%
19.0	1216.423	43.429	660.928	3.205%	54.095%
20.0	1104.197	41.414	702.342	3.056%	57.484%
21.0	962.753	37.835	740.177	2.792%	60.581%
22.0	887.812	36.471	776.648	2.692%	63.566%
23.0	819.036	35.094	811.742	2.590%	66.438%
24.0	738.103	32.922	844.664	2.430%	69.133%
25.0	670.963	31.096	875.759	2.295%	71.678%
26.0	617.808	29.699	905.459	2.192%	74.109%
27.0	572.930	28.523	933.982	2.105%	76.443%
28.0	538.551	27.726	961.708	2.046%	78.713%
29.0	508.668	27.043	988.751	1.996%	80.926%
30.0	482.653	26.464	1015.215	1.953%	83.092%
31.0	457.346	25.831	1041.046	1.906%	85.206%
32.0	430.942	25.043	1066.089	1.848%	87.256%
33.0	397.056	23.714	1089.803	1.750%	89.197%
34.0	360.125	22.083	1111.886	1.630%	91.004%
35.0	321.349	20.212	1132.099	1.492%	92.658%
36.0	278.629	17.960	1150.059	1.325%	94.128%
37.0	237.893	15.700	1165.758	1.159%	95.413%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
38.0	201.141	13.580	1179.338	1.002%	96.525%
39.0	149.071	10.288	1189.626	.759%	97.367%
40.0	107.453	7.574	1197.2	.559%	97.987%
41.0	65.365	4.703	1201.903	.347%	98.372%
42.0	38.747	2.843	1204.746	.210%	98.604%
43.0	22.999	1.720	1206.466	.127%	98.745%
44.0	14.814	1.129	1207.594	.083%	98.837%
45.0	11.421	0.886	1208.48	.065%	98.910%
46.0	9.437	0.744	1209.224	.055%	98.971%
47.0	8.074	0.648	1209.872	.048%	99.024%
48.0	7.158	0.583	1210.455	.043%	99.072%
49.0	6.508	0.539	1210.994	.040%	99.116%
50.0	6.119	0.514	1211.508	.038%	99.158%
51.0	5.771	0.492	1212	.036%	99.198%
52.0	5.476	0.473	1212.473	.035%	99.237%
53.0	5.174	0.453	1212.926	.033%	99.274%
54.0	4.930	0.437	1213.364	.032%	99.310%
55.0	4.658	0.418	1213.782	.031%	99.344%
56.0	4.437	0.403	1214.185	.030%	99.377%
57.0	4.217	0.388	1214.573	.029%	99.409%
58.0	3.944	0.367	1214.94	.027%	99.439%
59.0	3.759	0.353	1215.293	.026%	99.468%
60.0	3.567	0.339	1215.632	.025%	99.495%
61.0	3.411	0.327	1215.959	.024%	99.522%
62.0	3.202	0.310	1216.269	.023%	99.547%
63.0	3.045	0.298	1216.567	.022%	99.572%
64.0	2.912	0.287	1216.854	.021%	99.595%
65.0	2.773	0.276	1217.129	.020%	99.618%
66.0	2.633	0.264	1217.393	.019%	99.639%
67.0	2.512	0.254	1217.647	.019%	99.660%
68.0	2.419	0.246	1217.893	.018%	99.680%
69.0	2.343	0.240	1218.133	.018%	99.700%
70.0	2.227	0.230	1218.362	.017%	99.719%
71.0	2.146	0.223	1218.585	.016%	99.737%
72.0	2.042	0.213	1218.798	.016%	99.754%
73.0	1.984	0.208	1219.006	.015%	99.771%
74.0	1.926	0.203	1219.209	.015%	99.788%
75.0	1.856	0.197	1219.405	.015%	99.804%

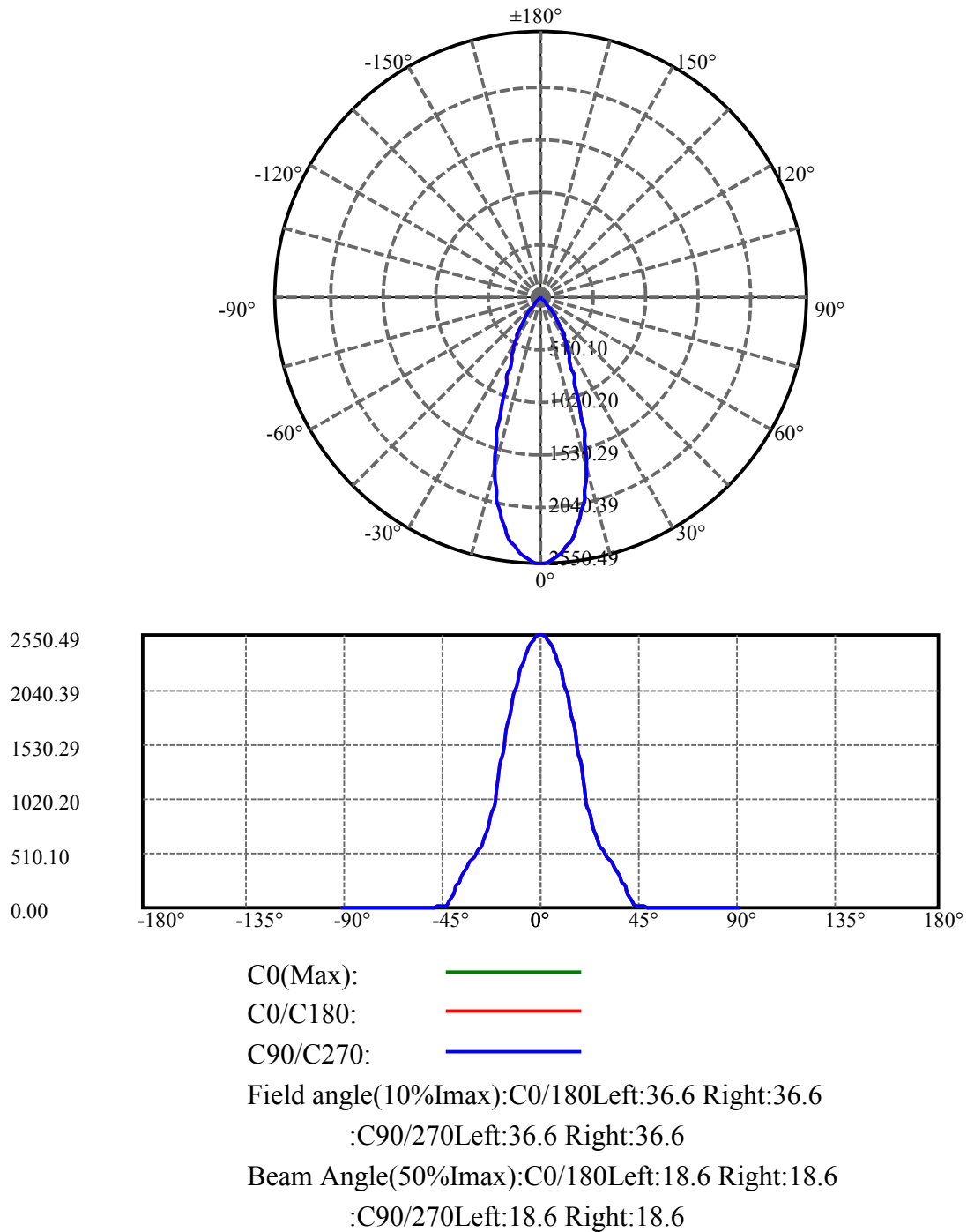
$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
76.0	1.781	0.189	1219.595	.014%	99.820%
77.0	1.723	0.184	1219.779	.014%	99.835%
78.0	1.688	0.181	1219.96	.013%	99.850%
79.0	1.642	0.177	1220.136	.013%	99.864%
80.0	1.584	0.171	1220.307	.013%	99.878%
81.0	1.555	0.168	1220.476	.012%	99.892%
82.0	1.520	0.165	1220.641	.012%	99.905%
83.0	1.473	0.160	1220.801	.012%	99.918%
84.0	1.473	0.161	1220.962	.012%	99.932%
85.0	1.433	0.157	1221.118	.012%	99.944%
86.0	1.404	0.154	1221.272	.011%	99.957%
87.0	1.386	0.152	1221.424	.011%	99.969%
88.0	1.363	0.149	1221.573	.011%	99.982%
89.0	1.375	0.151	1221.724	.011%	99.994%
90.0	1.351	0.074	1221.798	.005%	100.000%

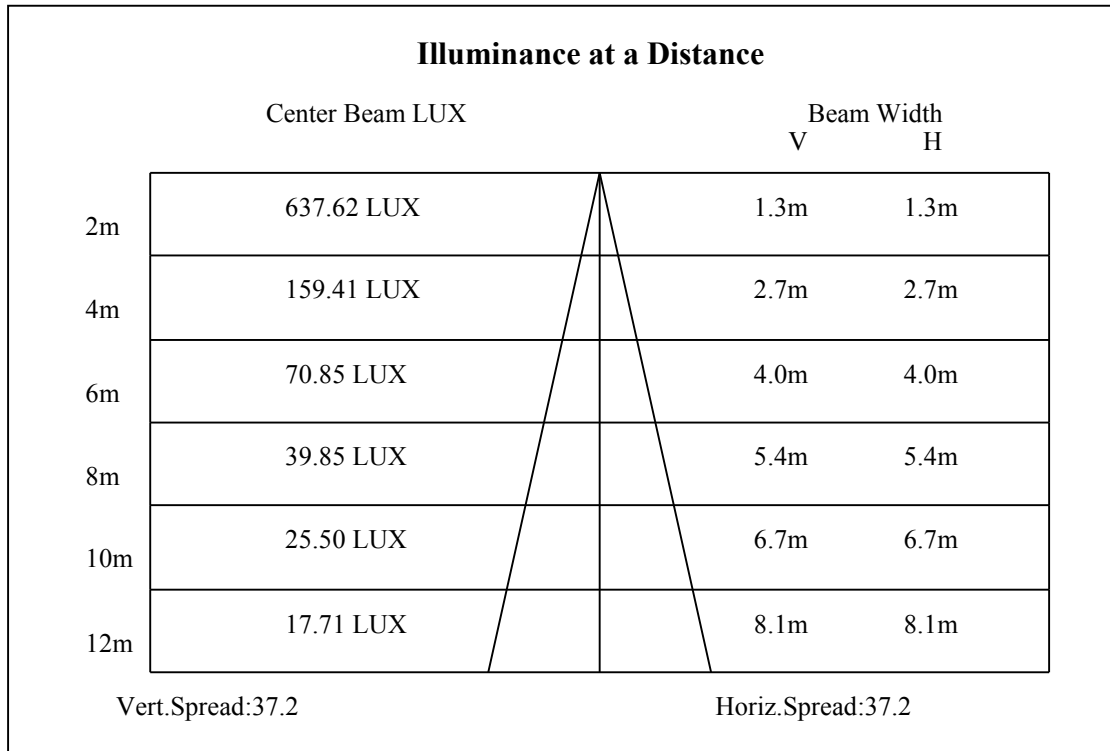
ZONAL LUMEN SUMMARY

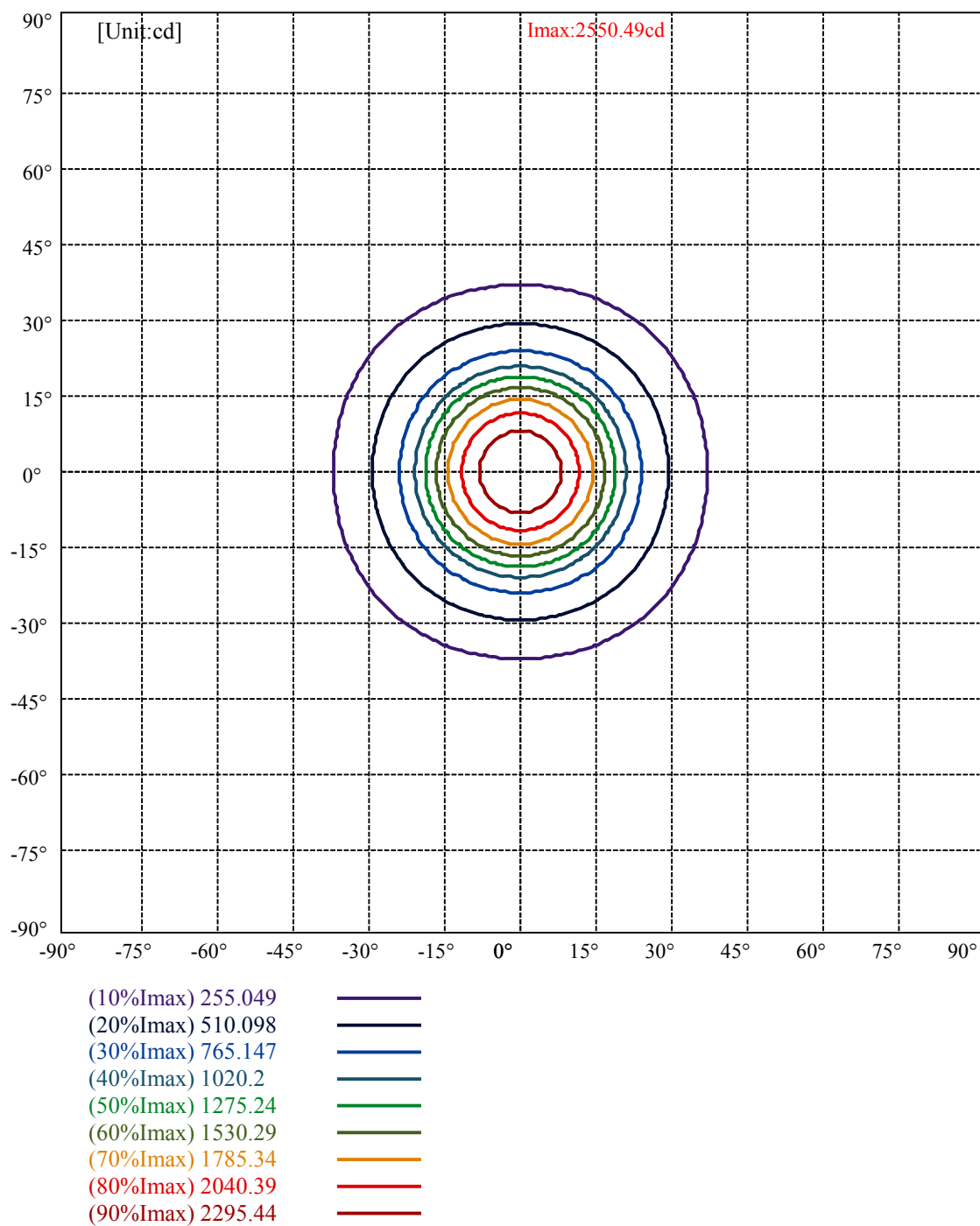
Zone	Lumens	%Lamp	%Fixt
0-30	1015.22	74.92%	83.09%
0-40	1197.20	88.35%	97.99%
0-60	1215.63	89.71%	99.50%
0-90	1221.72	90.16%	99.99%
0-120	1221.72	90.16%	99.99%
0-180	1221.80	90.17%	100.00%
60-90	6.43	0.47%	0.53%
90-120	0.00	0.00%	0.00%
90-130	0.00	0.00%	0.00%
90-150	0.00	0.00%	0.00%
90-180	0.00	0.00%	0.00%
0-28.58	977.44	72.14%	80.00%

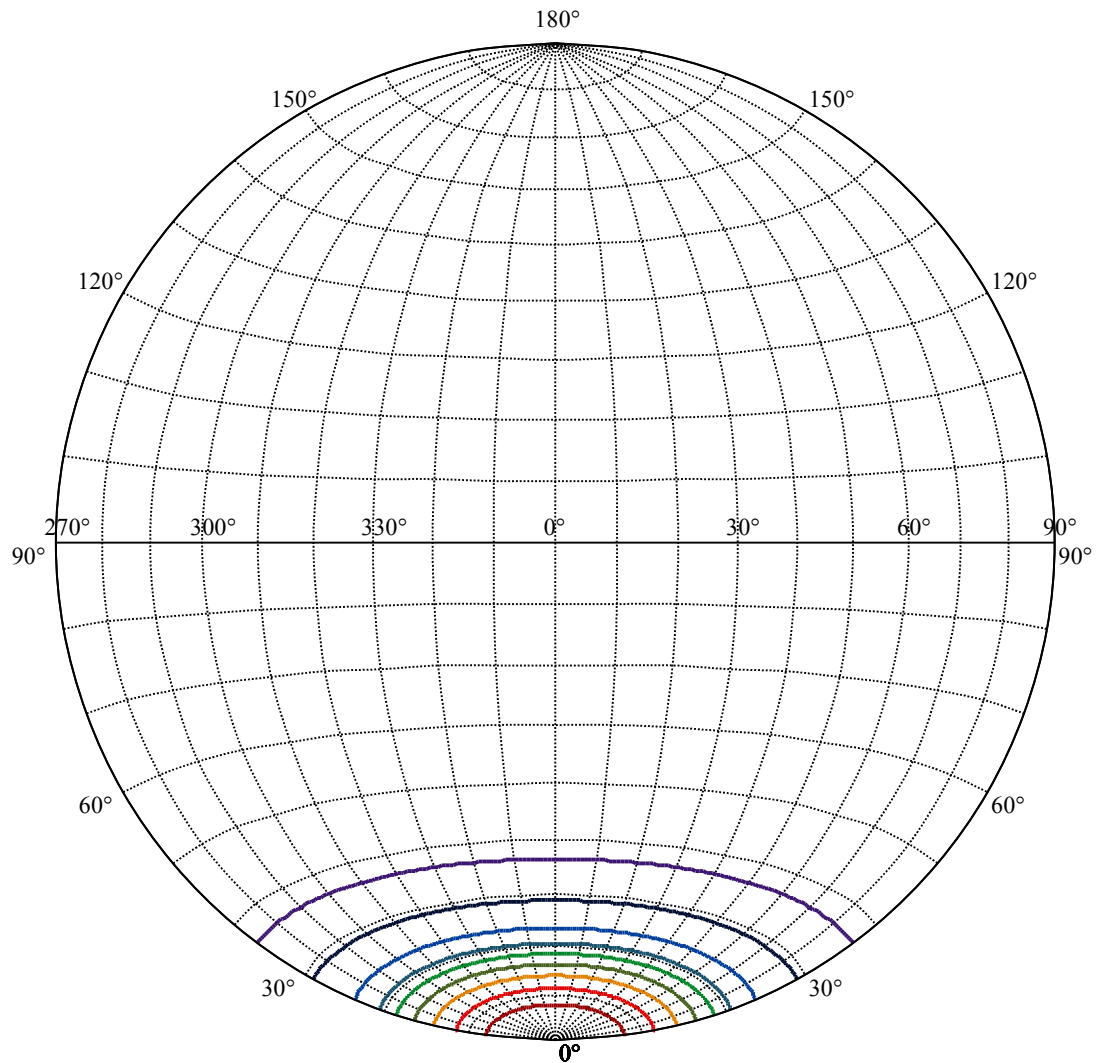
ZONAL LUMEN SUMMARY

0-10	245.34
10-20	457.00
20-30	312.87
30-40	181.98
40-50	14.31
50-60	4.12
60-70	2.73
70-80	1.95
80-90	1.42
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:2550.49

(10%Imax) 255.049

(20%Imax) 510.098

(30%Imax) 765.147

(40%Imax) 1020.2

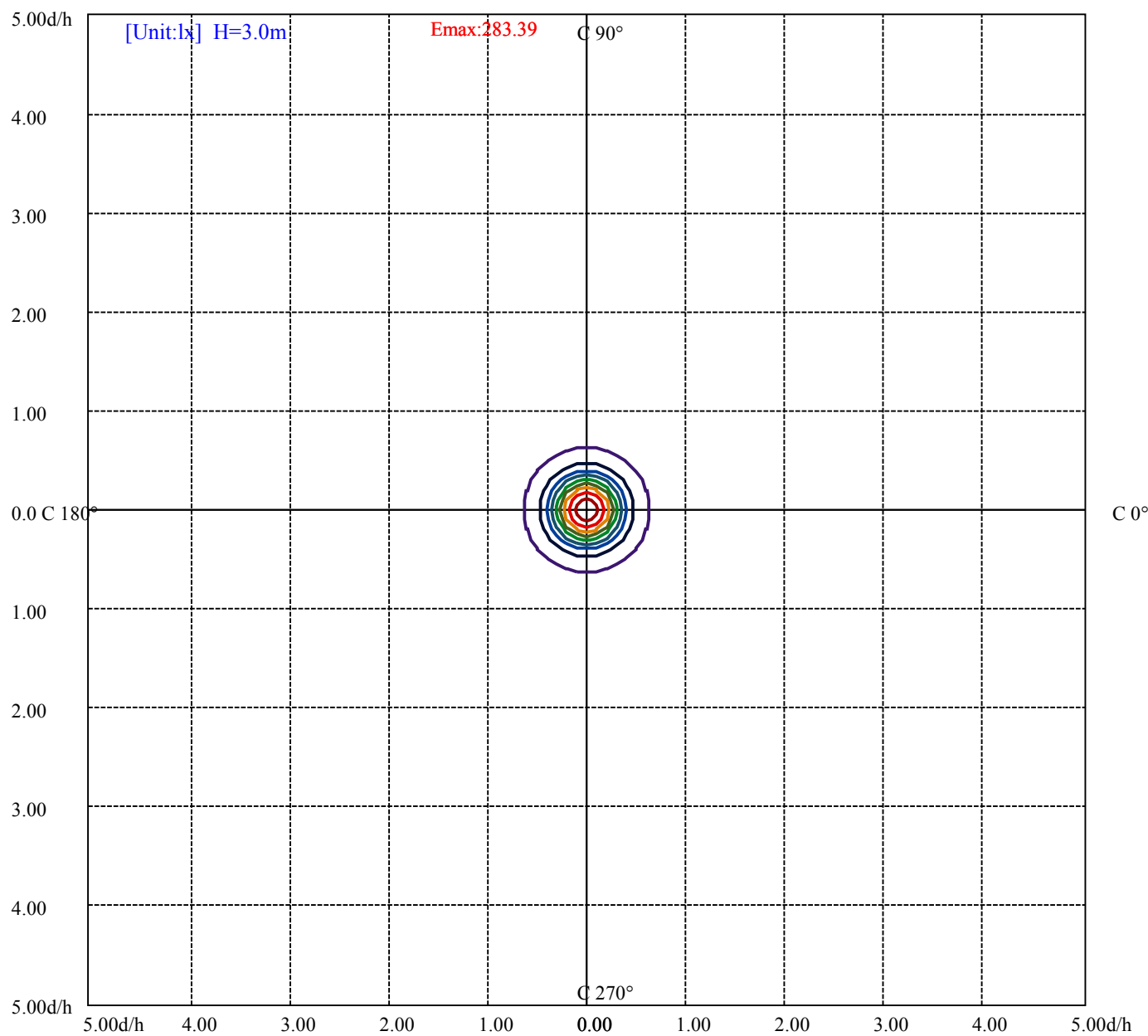
(50%Imax) 1275.24

(60%Imax) 1530.29

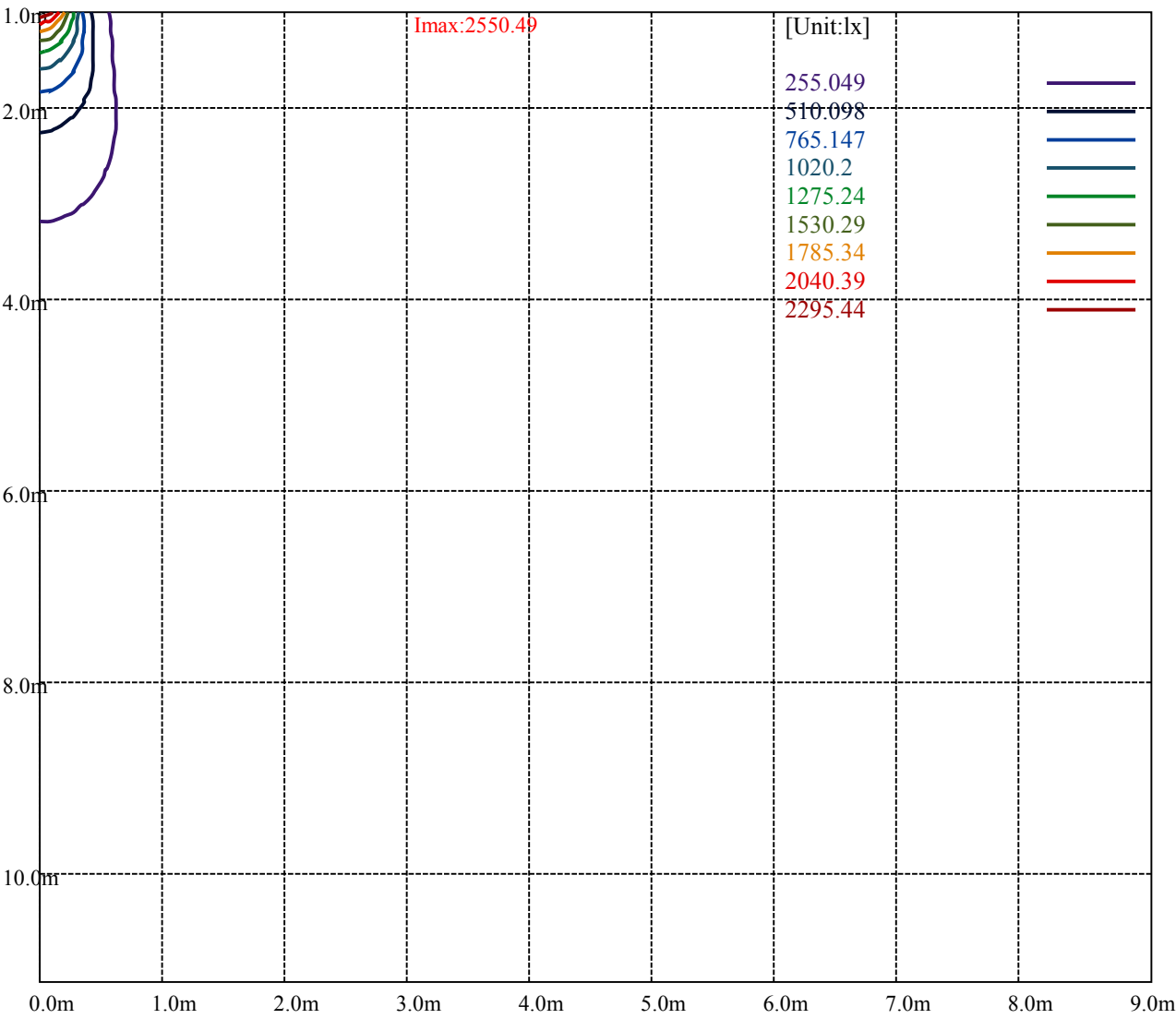
(70%Imax) 1785.34

(80%Imax) 2040.39

(90%Imax) 2295.44



(10%E _{max}) 28.33878	—
(20%E _{max}) 56.67756	—
(30%E _{max}) 85.01633	—
(40%E _{max}) 113.3556	—
(50%E _{max}) 141.6933	—
(60%E _{max}) 170.0322	—
(70%E _{max}) 198.3711	—
(80%E _{max}) 226.71	—
(90%E _{max}) 255.0489	—



Luminance Table

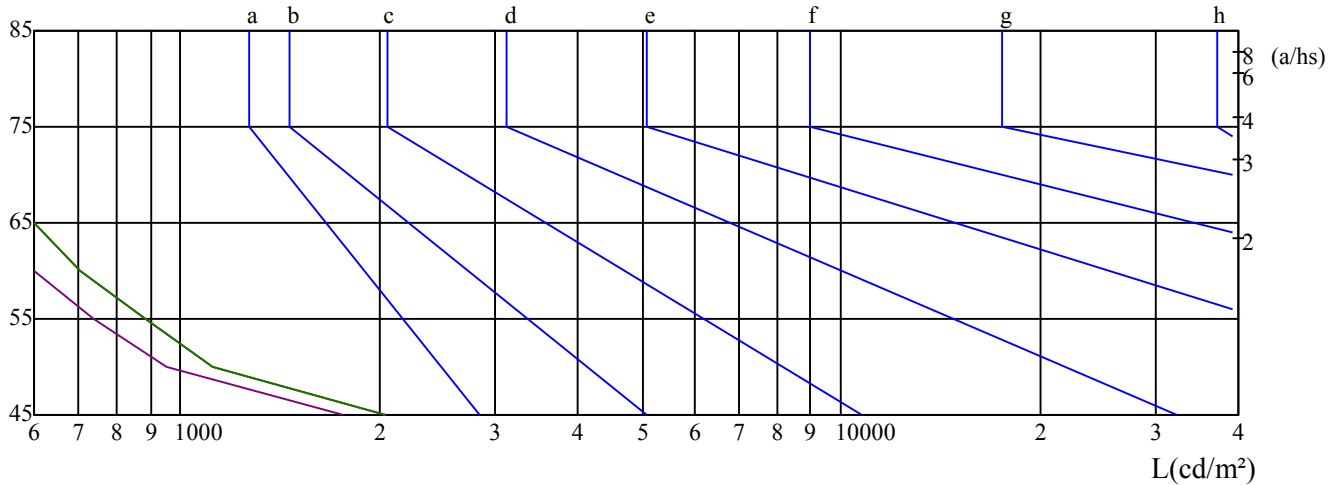
γ	45	50	55	60	65	70	75	80	85
C0	2042	1122	883	705	578	494	445	415	418
C45	1764	955	740	581	468	392	345	314	307
C90	2042	1122	883	705	578	494	445	415	418

L(Hor)(65)	L(Ver)(65)	L45(65)	L(Hor)(75)	L(Ver)(75)	L45(75)	L(Hor)(85)	L(Ver)(85)	L45(85)
1339	1339	1339	1464	1464	1464	3355	3355	3355

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

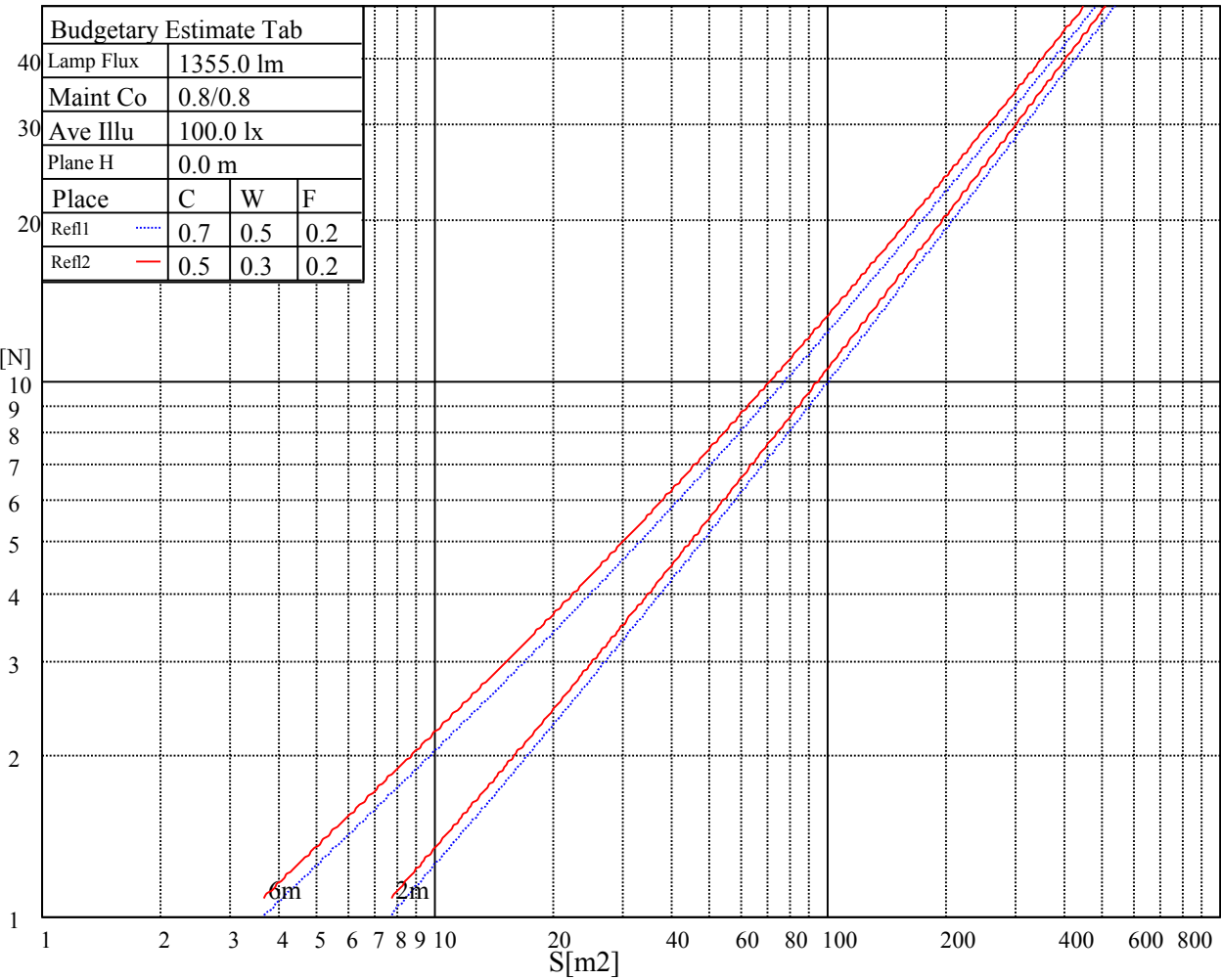
Luminance Limiting Curve

 $\gamma(^{\circ})$ 

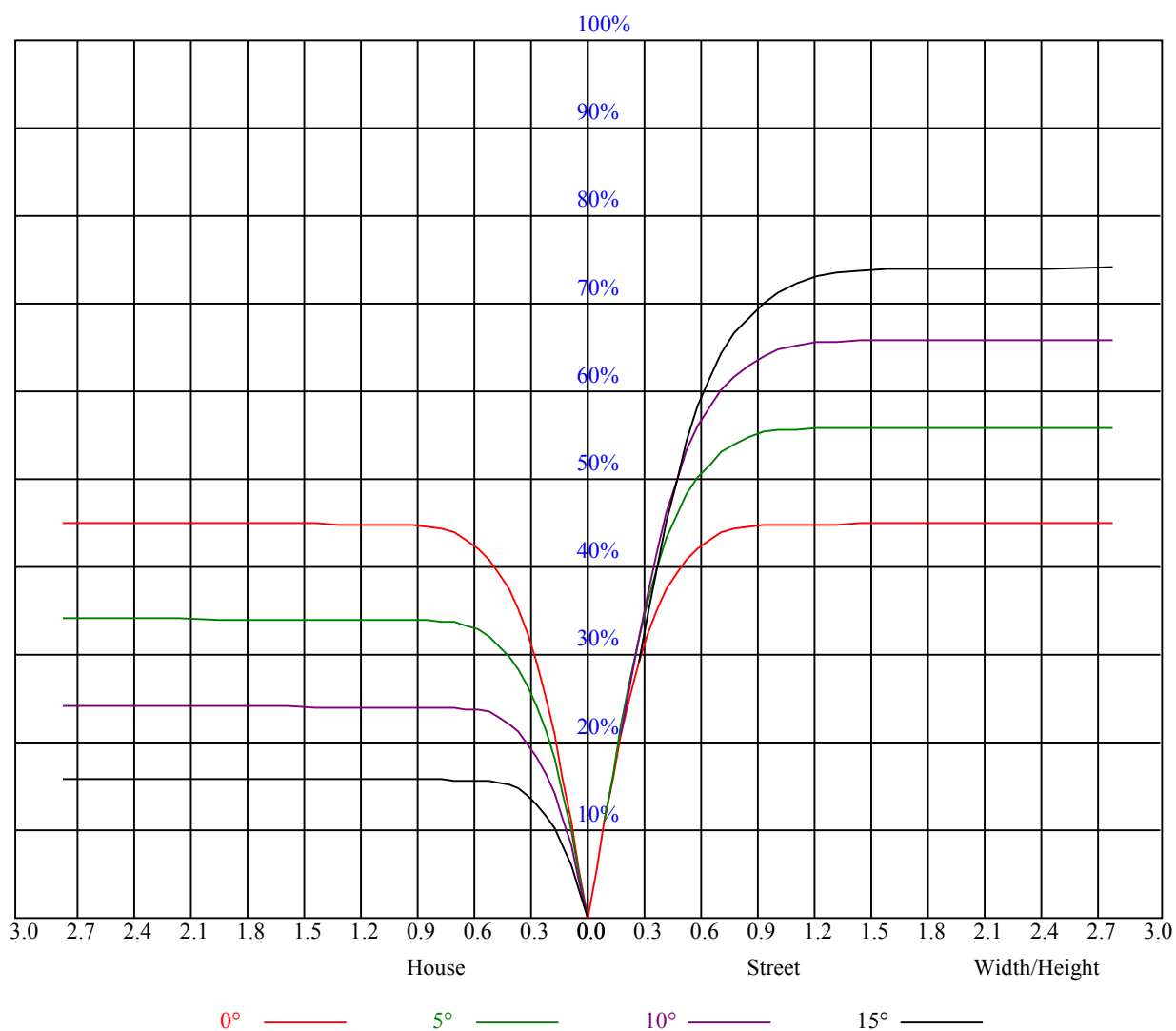
C0 ———

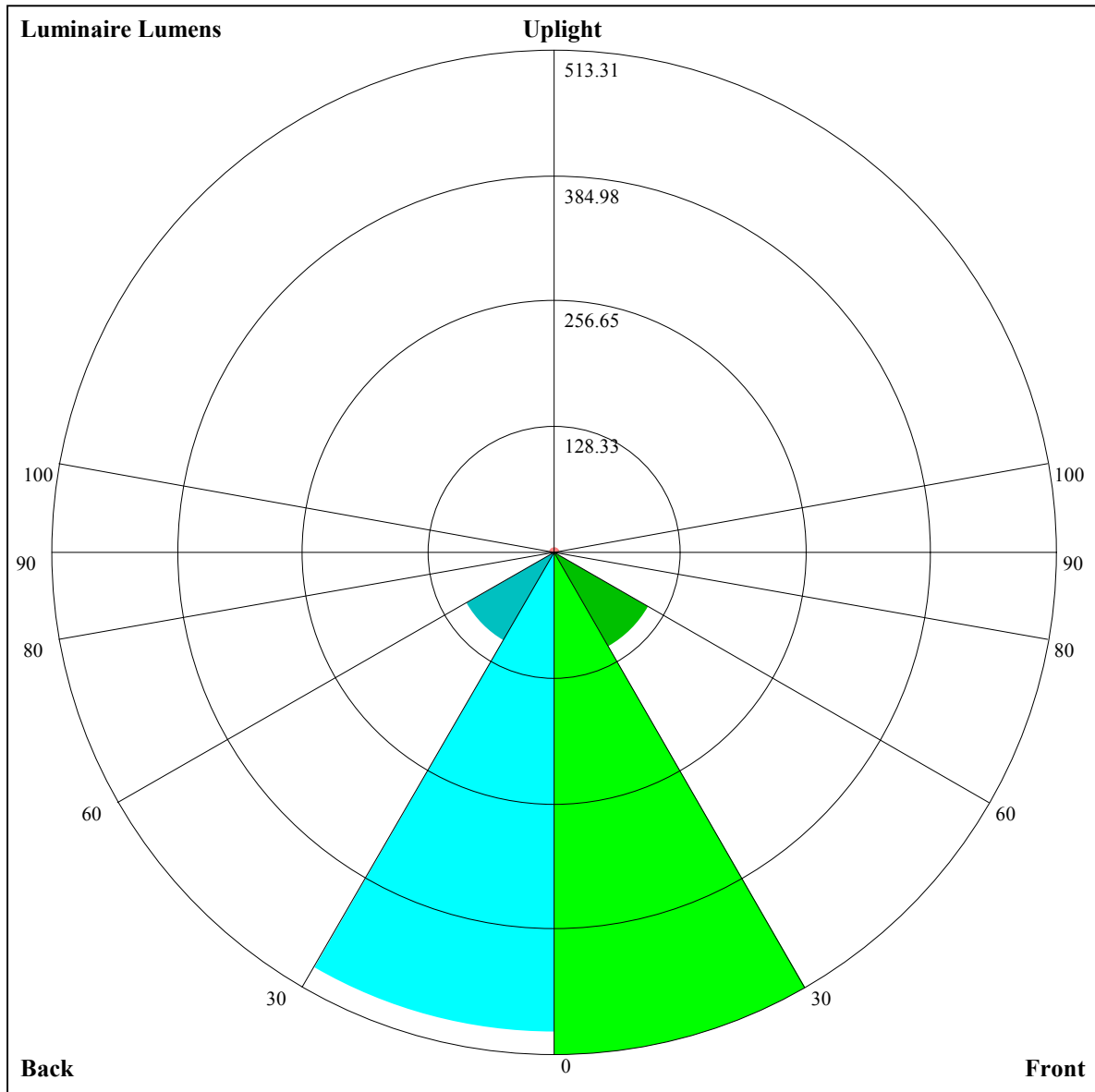
C45 ———

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	0.95	0.95	0.94	0.92	0.92	0.91	0.90	0.89	0.88	0.87	0.86
2	0.95	0.92	0.89	0.93	0.90	0.88	0.90	0.88	0.86	0.88	0.86	0.84	0.85	0.84	0.82	0.81
3	0.90	0.86	0.83	0.88	0.85	0.82	0.86	0.83	0.81	0.84	0.81	0.79	0.82	0.80	0.78	0.77
4	0.85	0.81	0.77	0.84	0.80	0.77	0.82	0.79	0.76	0.80	0.77	0.75	0.79	0.76	0.74	0.73
5	0.81	0.76	0.73	0.80	0.76	0.72	0.78	0.75	0.72	0.77	0.74	0.71	0.75	0.73	0.71	0.69
6	0.77	0.72	0.69	0.76	0.72	0.69	0.75	0.71	0.68	0.74	0.70	0.68	0.72	0.69	0.67	0.66
7	0.73	0.68	0.65	0.73	0.68	0.65	0.71	0.68	0.65	0.70	0.67	0.64	0.70	0.66	0.64	0.63
8	0.70	0.65	0.62	0.69	0.65	0.62	0.68	0.65	0.62	0.68	0.64	0.61	0.67	0.64	0.61	0.60
9	0.67	0.62	0.59	0.66	0.62	0.59	0.66	0.62	0.59	0.65	0.61	0.59	0.64	0.61	0.59	0.58
10	0.64	0.60	0.57	0.64	0.59	0.57	0.63	0.59	0.56	0.62	0.59	0.56	0.62	0.59	0.56	0.55





Luminaire Lumens:

FL=513.31,FM=111.66,FH=2.39,FVH=0.79

BL=490.63,BM=104.54,BH=2.38,BVH=0.78

UL=1.47,UH=7.02

BUG Rating:B1-U1-G0

NATA 2-1676-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	2553.16	2552.69	2542.49	2524.39	2498.87	2466.85	2429.73	2384.71	2333.67
45.0	2548.52	2549.45	2538.31	2517.43	2488.66	2454.78	2412.09	2362.90	2309.54
90.0	2542.95	2519.75	2487.27	2448.29	2403.74	2353.62	2297.01	2245.04	2174.51
135.0	2557.33	2549.91	2530.88	2503.97	2471.02	2429.73	2383.79	2331.81	2272.42
180.0	2553.16	2544.34	2527.17	2502.11	2469.17	2429.26	2383.32	2329.96	2269.63
225.0	2548.52	2536.45	2524.85	2484.95	2464.53	2423.23	2353.62	2320.21	2259.43
270.0	2542.95	2555.48	2557.80	2548.98	2529.96	2503.51	2469.17	2428.33	2381.00
315.0	2557.33	2563.83	2560.12	2545.73	2525.78	2498.87	2463.14	2419.98	2370.33
360.0	2553.16	2552.69	2542.49	2524.39	2498.87	2466.85	2429.73	2384.71	2333.67
C/ γ (°)	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0
0.0	2274.74	2207.45	2132.28	2082.16	1952.24	1890.52	1781.93	1666.39	1546.21
45.0	2250.14	2183.79	2110.93	2032.05	1946.20	1851.54	1790.29	1682.63	1521.15
90.0	2098.87	2016.74	1927.64	1830.66	1725.32	1614.42	1497.02	1377.30	1255.72
135.0	2205.60	2127.18	2037.15	1937.85	1830.66	1718.83	1604.67	1488.20	1370.80
180.0	2200.96	2123.00	2054.32	1939.71	1832.98	1743.88	1628.80	1511.87	1395.39
225.0	2190.28	2114.18	2032.05	1944.35	1851.08	1748.99	1641.80	1528.57	1411.64
270.0	2326.25	2265.46	2196.32	2121.14	2039.47	1950.38	1892.84	1751.77	1641.33
315.0	2311.86	2239.47	2155.02	2065.00	1971.26	1870.10	1762.45	1650.61	1535.07
360.0	2274.74	2207.45	2132.28	2082.16	1952.24	1890.52	1781.93	1666.39	1546.21
C/ γ (°)	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0	26.0
0.0	1425.56	1306.76	1187.97	912.06	871.69	853.26	764.91	691.50	642.18
45.0	1449.69	1329.50	1208.39	1086.35	964.31	853.40	762.45	687.28	625.10
90.0	1136.46	868.48	868.48	811.92	761.57	689.51	630.16	584.36	547.84
135.0	1254.33	1141.57	1054.33	923.01	827.88	763.38	694.70	636.70	590.30
180.0	1278.46	1164.31	1053.87	943.89	848.76	767.09	699.81	642.73	596.79
225.0	1292.38	1171.73	903.15	903.15	863.29	775.26	702.27	641.25	594.19
270.0	1570.80	1450.61	1329.97	1211.17	1095.17	980.55	870.11	777.77	701.66
315.0	1417.20	1298.41	1227.41	910.48	869.83	869.83	780.41	706.12	644.40
360.0	1425.56	1306.76	1187.97	912.06	871.69	853.26	764.91	691.50	642.18
C/ γ (°)	27.0	28.0	29.0	30.0	31.0	32.0	33.0	34.0	35.0
0.0	583.66	552.34	519.30	490.76	465.66	442.13	414.06	379.35	338.98
45.0	578.23	541.11	510.95	485.43	462.22	440.41	408.40	372.20	333.22
90.0	517.72	491.46	468.35	446.82	418.00	381.57	341.02	298.56	254.06
135.0	552.71	522.55	496.56	473.36	449.23	419.53	387.05	350.39	306.31
180.0	559.21	528.58	501.67	477.54	452.94	434.38	384.27	342.04	314.66
225.0	557.21	526.49	499.58	475.63	451.83	417.86	378.14	335.59	293.08
270.0	639.02	590.30	551.32	519.76	492.39	468.26	447.37	418.14	381.48
315.0	595.68	555.59	521.62	491.92	466.49	443.38	416.15	384.73	349.00
360.0	583.66	552.34	519.30	490.76	465.66	442.13	414.06	379.35	338.98
C/ γ (°)	36.0	37.0	38.0	39.0	40.0	41.0	42.0	43.0	44.0
0.0	294.01	245.71	195.96	147.19	101.67	64.50	37.03	20.42	14.52
45.0	291.00	248.77	248.77	232.06	129.51	90.53	55.59	28.63	16.06
90.0	208.68	163.39	120.00	80.65	46.82	23.02	14.29	12.58	9.93
135.0	253.87	242.74	174.38	103.29	66.59	39.77	21.86	13.55	11.60
180.0	266.87	246.45	236.24	114.20	71.09	41.02	22.09	13.41	11.42
225.0	249.97	206.96	164.41	123.20	99.30	63.43	25.71	16.52	12.58
270.0	341.11	298.88	254.80	236.70	236.70	129.14	89.14	53.92	27.52
315.0	323.52	250.25	214.57	155.27	107.93	71.51	44.27	24.96	14.90
360.0	294.01	245.71	195.96	147.19	101.67	64.50	37.03	20.42	14.52

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	11.83	9.51	8.21	7.33	6.54	6.36	5.99	5.61	5.38
45.0	13.41	10.72	8.86	7.70	6.68	6.31	6.13	5.80	5.34
90.0	8.68	7.70	6.64	6.31	5.94	5.61	5.34	5.06	4.78
135.0	9.79	8.31	7.56	6.91	6.40	5.99	5.66	5.43	5.10
180.0	9.51	8.03	7.24	6.59	6.22	5.94	5.66	5.43	5.15
225.0	10.58	8.68	7.47	6.45	6.13	5.85	5.48	5.20	4.97
270.0	15.27	12.53	10.26	8.54	7.70	6.73	6.13	5.85	5.52
315.0	12.30	10.02	8.35	7.42	6.45	6.17	5.80	5.43	5.15
360.0	11.83	9.51	8.21	7.33	6.54	6.36	5.99	5.61	5.38
C/ γ (°)	54.0	55.0	56.0	57.0	58.0	59.0	60.0	61.0	62.0
0.0	5.10	4.78	4.55	4.32	4.08	3.81	3.57	3.39	3.20
45.0	5.15	4.92	4.69	4.41	4.08	3.90	3.76	3.48	3.25
90.0	4.50	4.32	4.08	3.81	3.53	3.39	3.25	3.16	2.88
135.0	4.83	4.59	4.41	4.08	3.94	3.71	3.53	3.39	3.20
180.0	4.83	4.55	4.41	4.18	3.90	3.71	3.57	3.43	3.20
225.0	4.73	4.45	4.22	4.04	3.85	3.57	3.39	3.29	3.16
270.0	5.38	5.01	4.78	4.64	4.22	4.18	3.85	3.71	3.48
315.0	4.92	4.64	4.36	4.27	3.94	3.81	3.62	3.43	3.25
360.0	5.10	4.78	4.55	4.32	4.08	3.81	3.57	3.39	3.20
C/ γ (°)	63.0	64.0	65.0	66.0	67.0	68.0	69.0	70.0	71.0
0.0	3.02	2.83	2.74	2.64	2.46	2.37	2.37	2.23	2.18
45.0	3.11	2.97	2.78	2.60	2.51	2.41	2.32	2.18	2.09
90.0	2.78	2.69	2.51	2.37	2.37	2.23	2.18	2.09	2.00
135.0	3.02	2.92	2.78	2.60	2.51	2.46	2.37	2.18	2.13
180.0	3.02	2.92	2.83	2.64	2.51	2.46	2.37	2.23	2.23
225.0	3.02	2.83	2.74	2.69	2.51	2.37	2.32	2.23	2.09
270.0	3.29	3.16	3.02	2.88	2.69	2.60	2.51	2.46	2.27
315.0	3.11	2.97	2.78	2.64	2.55	2.46	2.32	2.23	2.18
360.0	3.02	2.83	2.74	2.64	2.46	2.37	2.37	2.23	2.18
C/ γ (°)	72.0	73.0	74.0	75.0	76.0	77.0	78.0	79.0	80.0
0.0	2.00	1.95	1.95	1.90	1.76	1.72	1.72	1.67	1.58
45.0	2.04	2.00	1.86	1.81	1.76	1.72	1.67	1.58	1.58
90.0	1.86	1.86	1.86	1.76	1.67	1.67	1.62	1.58	1.53
135.0	2.09	2.00	1.90	1.81	1.86	1.76	1.67	1.67	1.58
180.0	2.09	2.00	1.95	1.86	1.81	1.72	1.72	1.72	1.58
225.0	2.00	1.95	1.95	1.81	1.72	1.72	1.67	1.58	1.53
270.0	2.18	2.13	2.04	2.00	1.86	1.81	1.76	1.67	1.67
315.0	2.09	2.00	1.90	1.90	1.81	1.67	1.67	1.67	1.62
360.0	2.00	1.95	1.95	1.90	1.76	1.72	1.72	1.67	1.58
C/ γ (°)	81.0	82.0	83.0	84.0	85.0	86.0	87.0	88.0	89.0
0.0	1.48	1.48	1.48	1.44	1.48	1.39	1.35	1.39	1.39
45.0	1.58	1.53	1.48	1.48	1.48	1.44	1.44	1.39	1.35
90.0	1.58	1.58	1.48	1.44	1.44	1.44	1.39	1.35	1.39
135.0	1.58	1.48	1.53	1.48	1.44	1.48	1.39	1.35	1.39
180.0	1.53	1.48	1.44	1.48	1.39	1.39	1.39	1.39	1.39
225.0	1.53	1.53	1.44	1.44	1.39	1.30	1.39	1.30	1.35
270.0	1.58	1.58	1.48	1.53	1.44	1.39	1.35	1.35	1.35
315.0	1.58	1.48	1.44	1.48	1.39	1.39	1.39	1.39	1.39
360.0	1.48	1.48	1.48	1.44	1.48	1.39	1.35	1.39	1.39

Intensity data(cd)

Appendix Page: 19 Total:19

C/ γ (°)	90.0
0.0	1.39
45.0	1.35
90.0	1.44
135.0	1.35
180.0	1.35
225.0	1.35
270.0	1.25
315.0	1.35
360.0	1.39