
NATA

Client:

LumCAT: 3-2046-M

Luminaire: 92.70.135.00

Report No: NT2018010517

Test No: GC2018010517

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

Lamp flux(lm): 1355.0

Number of Lamps: 1

Length(mm): 85

Phm Type: C

Voltage(V): 220.4000

Current(A): 0.0950

Power (W): 19.2500

PF: 0.9190

Ballast type: AC

Width(mm): 85

Height(mm): 0

Photometric Results

Lumens(lm): 1215.58, Efficiency(%): 89.71% , Luminous Efficacy(lm/W): 63.15

Central intensity(cd): 2800.314, Maximum intensity(cd): 2800.314

Angle of maximum intensity: C=0.0 γ =0.0

Beam Angle(50%Imax): [C0/180]Total=35.6

[C90/270]Total=35.6

Field angle(10%Imax): [C0/180]Total=69.8

[C90/270]Total=69.8

Maximum s/h(1/2): C0_180=0.58 C90_270=0.58

Maximum s/h(1/4): C0_180=0.59 C90_270=0.59

Up flux rate of lamp(%): 0.00%

Down flux rate of lamp(%): 89.76%

Up flux rate of LUM(%): - -

Down flux rate of LUM(%): 100.00%

CIE Type : Direct lighting

Output flux ratio in π solid angle : 99.545%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
0.0	2800.314	0.670	0.67	.049%	.055%
1.0	2795.268	5.350	6.02	.395%	.495%
2.0	2780.013	10.639	16.659	.785%	1.370%
3.0	2757.217	15.824	32.483	1.168%	2.672%
4.0	2726.765	20.859	53.342	1.539%	4.388%
5.0	2686.104	25.673	79.015	1.895%	6.500%
6.0	2629.202	30.138	109.152	2.224%	8.979%
7.0	2558.727	34.196	143.348	2.524%	11.793%
8.0	2480.247	37.853	181.201	2.794%	14.907%
9.0	2380.190	40.832	222.032	3.013%	18.266%
10.0	2275.840	43.337	265.37	3.198%	21.831%
11.0	2171.375	45.434	310.804	3.353%	25.568%
12.0	2061.805	47.009	357.813	3.469%	29.436%
13.0	1955.541	48.240	406.053	3.560%	33.404%
14.0	1847.306	49.008	455.061	3.617%	37.436%
15.0	1730.079	49.104	504.165	3.624%	41.475%
16.0	1605.080	48.516	552.681	3.581%	45.467%
17.0	1490.464	47.787	600.468	3.527%	49.398%
18.0	1370.627	46.447	646.914	3.428%	53.219%
19.0	1249.619	44.614	691.528	3.293%	56.889%
20.0	1141.267	42.805	734.333	3.159%	60.410%
21.0	1013.321	39.822	774.155	2.939%	63.686%
22.0	923.635	37.943	812.098	2.800%	66.808%
23.0	849.813	36.413	848.511	2.687%	69.803%
24.0	770.551	34.369	882.88	2.536%	72.630%
25.0	694.559	32.189	915.069	2.376%	75.279%
26.0	628.597	30.218	945.287	2.230%	77.764%
27.0	572.948	28.524	973.811	2.105%	80.111%
28.0	531.394	27.358	1001.169	2.019%	82.362%
29.0	496.841	26.414	1027.583	1.949%	84.535%
30.0	468.813	25.705	1053.288	1.897%	86.649%
31.0	442.665	25.001	1078.29	1.845%	88.706%
32.0	410.235	23.839	1102.129	1.759%	90.667%
33.0	374.568	22.371	1124.5	1.651%	92.507%
34.0	328.037	20.116	1144.616	1.485%	94.162%
35.0	274.052	17.238	1161.854	1.272%	95.580%
36.0	230.828	14.878	1176.732	1.098%	96.804%
37.0	179.030	11.815	1188.547	.872%	97.776%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
38.0	109.523	7.394	1195.942	.546%	98.385%
39.0	76.397	5.272	1201.214	.389%	98.818%
40.0	35.858	2.528	1203.741	.187%	99.026%
41.0	17.900	1.288	1205.029	.095%	99.132%
42.0	10.713	0.786	1205.815	.058%	99.197%
43.0	7.013	0.524	1206.34	.039%	99.240%
44.0	5.394	0.411	1206.751	.030%	99.274%
45.0	4.205	0.326	1207.077	.024%	99.301%
46.0	3.724	0.294	1207.371	.022%	99.325%
47.0	3.428	0.275	1207.646	.020%	99.347%
48.0	3.271	0.267	1207.912	.020%	99.369%
49.0	3.150	0.261	1208.173	.019%	99.391%
50.0	3.028	0.254	1208.427	.019%	99.412%
51.0	2.912	0.248	1208.675	.018%	99.432%
52.0	2.796	0.242	1208.917	.018%	99.452%
53.0	2.691	0.236	1209.153	.017%	99.471%
54.0	2.593	0.230	1209.383	.017%	99.490%
55.0	2.494	0.224	1209.607	.017%	99.509%
56.0	2.425	0.220	1209.827	.016%	99.527%
57.0	2.338	0.215	1210.042	.016%	99.545%
58.0	2.274	0.211	1210.254	.016%	99.562%
59.0	2.187	0.206	1210.459	.015%	99.579%
60.0	2.135	0.203	1210.662	.015%	99.596%
61.0	2.100	0.201	1210.863	.015%	99.612%
62.0	2.013	0.195	1211.058	.014%	99.628%
63.0	1.949	0.190	1211.249	.014%	99.644%
64.0	1.920	0.189	1211.438	.014%	99.659%
65.0	1.891	0.188	1211.626	.014%	99.675%
66.0	1.833	0.184	1211.809	.014%	99.690%
67.0	1.781	0.180	1211.989	.013%	99.705%
68.0	1.769	0.180	1212.169	.013%	99.720%
69.0	1.758	0.180	1212.349	.013%	99.734%
70.0	1.700	0.175	1212.524	.013%	99.749%
71.0	1.665	0.173	1212.697	.013%	99.763%
72.0	1.642	0.171	1212.868	.013%	99.777%
73.0	1.607	0.168	1213.036	.012%	99.791%
74.0	1.578	0.166	1213.203	.012%	99.805%
75.0	1.555	0.165	1213.367	.012%	99.818%

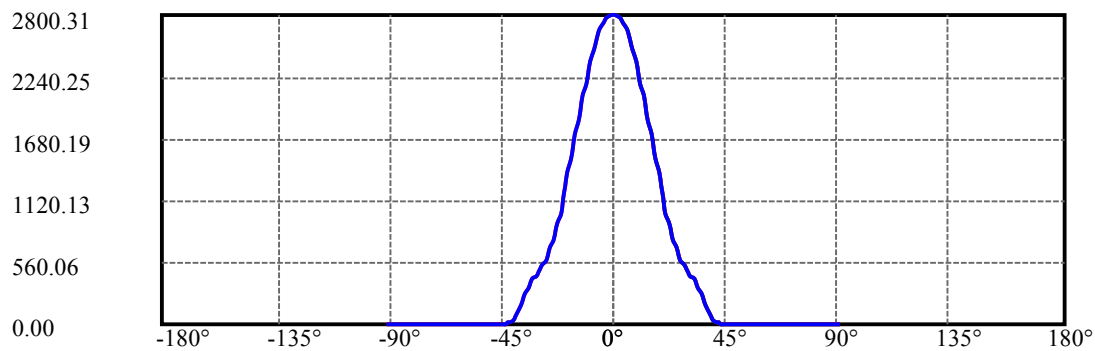
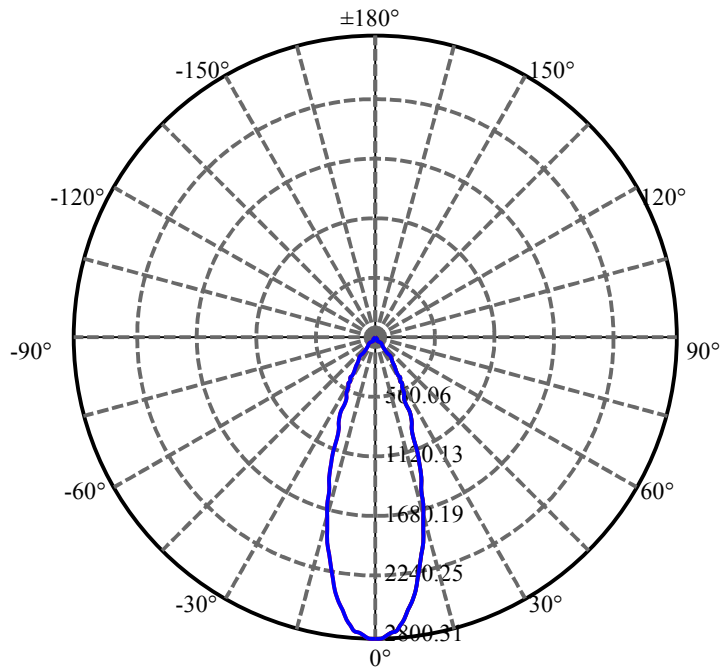
$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
76.0	1.531	0.163	1213.53	.012%	99.832%
77.0	1.502	0.161	1213.691	.012%	99.845%
78.0	1.479	0.159	1213.849	.012%	99.858%
79.0	1.439	0.155	1214.004	.011%	99.871%
80.0	1.450	0.157	1214.161	.012%	99.883%
81.0	1.433	0.155	1214.316	.011%	99.896%
82.0	1.398	0.152	1214.468	.011%	99.909%
83.0	1.363	0.148	1214.616	.011%	99.921%
84.0	1.357	0.148	1214.764	.011%	99.933%
85.0	1.346	0.147	1214.911	.011%	99.945%
86.0	1.346	0.147	1215.058	.011%	99.957%
87.0	1.346	0.147	1215.206	.011%	99.969%
88.0	1.334	0.146	1215.352	.011%	99.981%
89.0	1.351	0.148	1215.5	.011%	99.994%
90.0	1.410	0.077	1215.578	.006%	100.000%

ZONAL LUMEN SUMMARY

Zone	Lumens	%Lamp	%Fixt
0-30	1053.29	77.73%	86.65%
0-40	1203.74	88.84%	99.03%
0-60	1210.66	89.35%	99.60%
0-90	1215.50	89.70%	99.99%
0-120	1215.50	89.70%	99.99%
0-180	1215.58	89.71%	100.00%
60-90	5.04	0.37%	0.41%
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%
0-26.95	972.46	71.77%	80.00%

ZONAL LUMEN SUMMARY

0-10	265.37
10-20	468.96
20-30	318.96
30-40	150.45
40-50	4.69
50-60	2.23
60-70	1.86
70-80	1.64
80-90	1.34
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

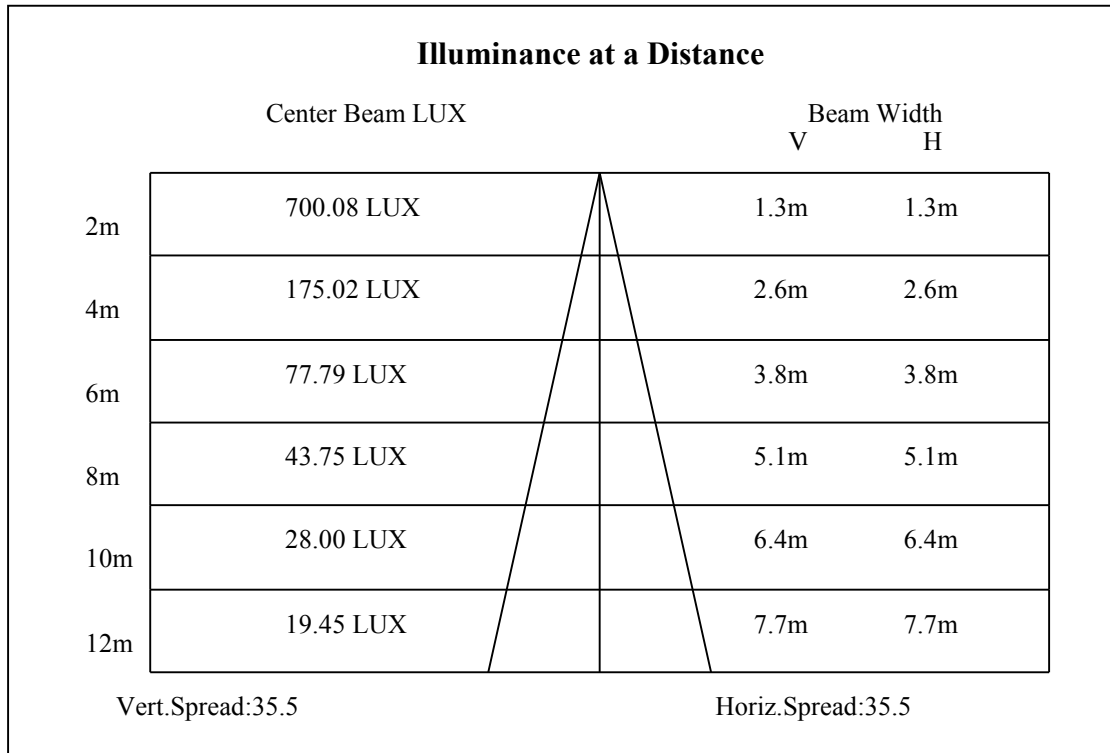
C0(Max): —————C0/C180: —————C90/C270: —————

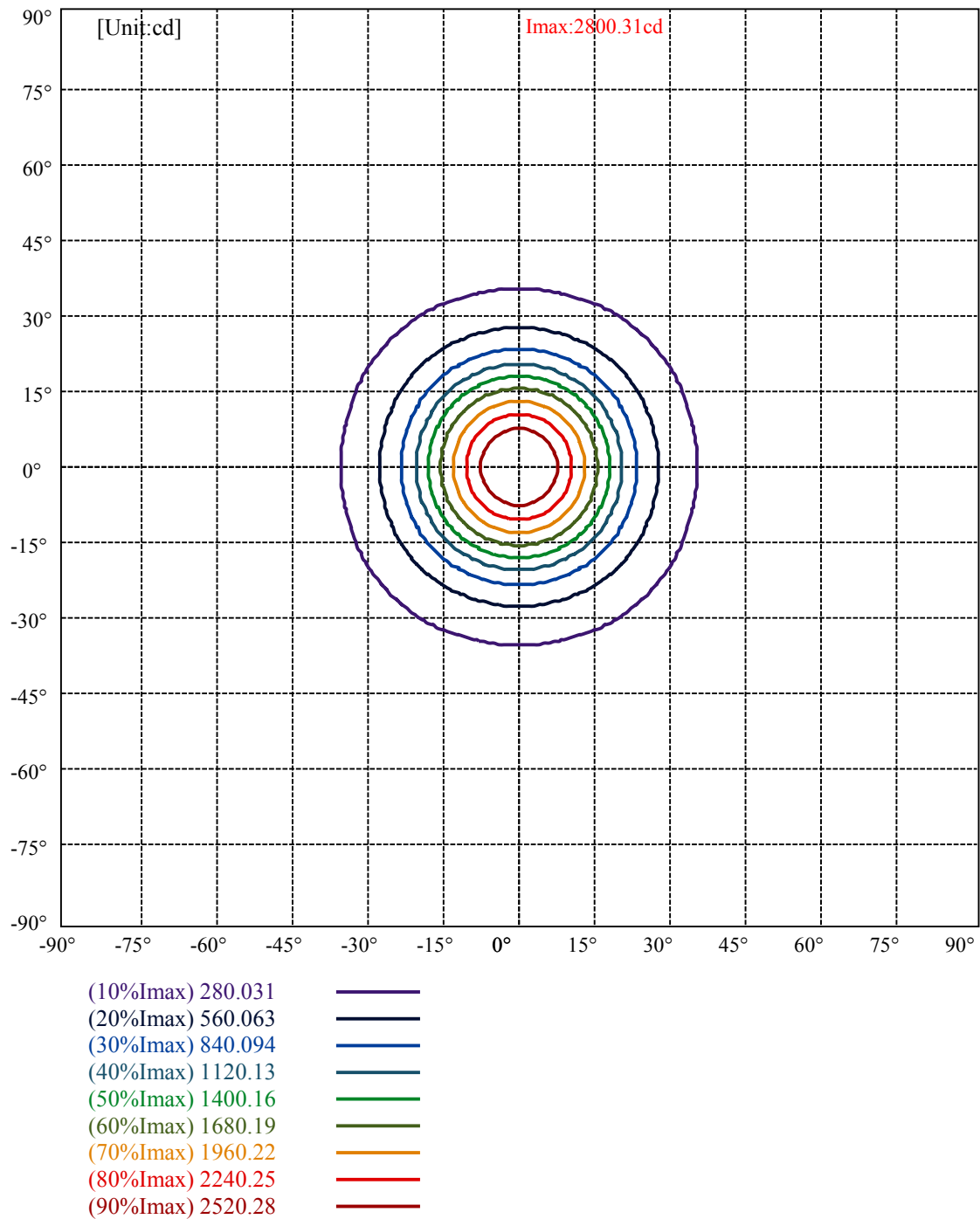
Field angle(10%Imax):C0/180Left:34.9 Right:34.9

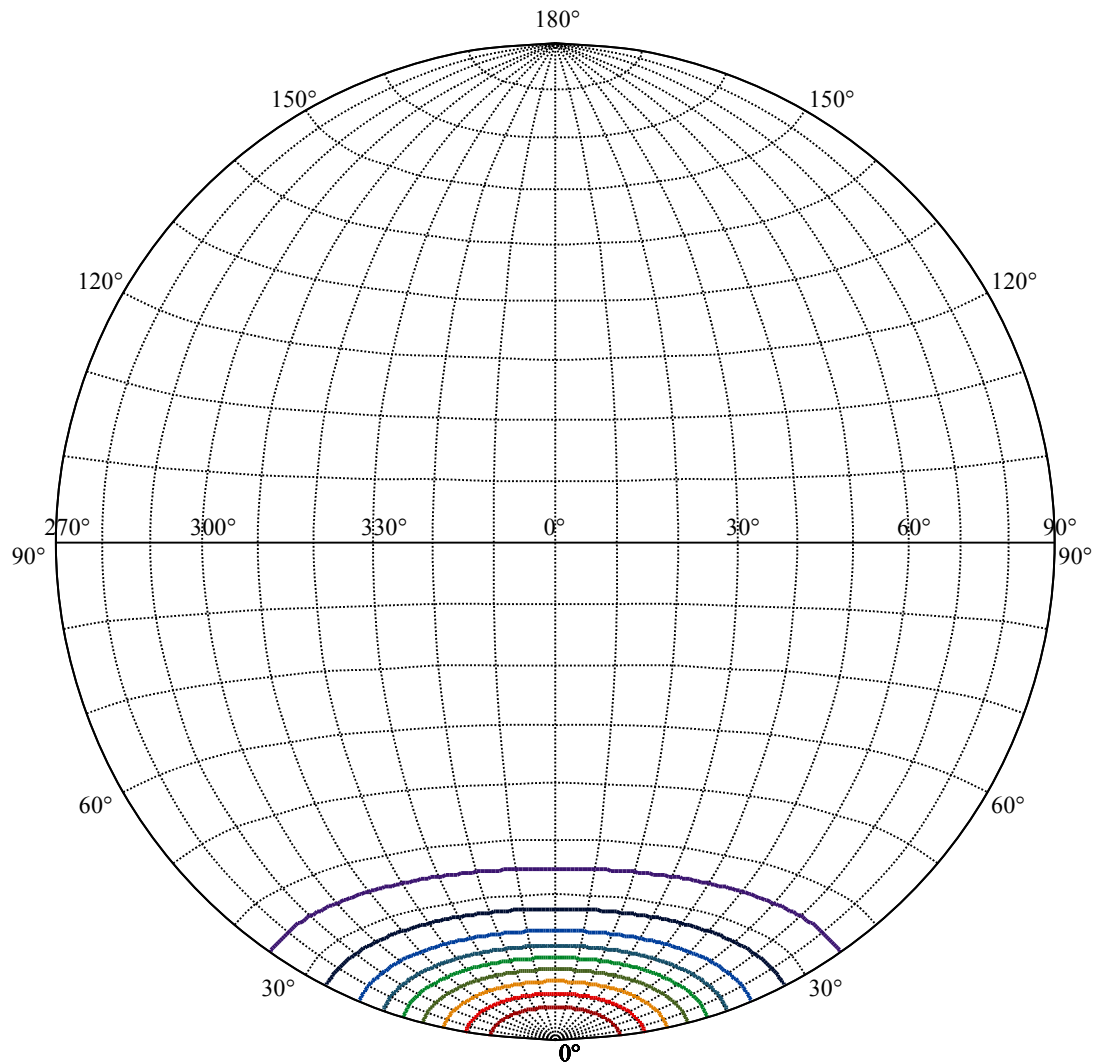
:C90/270Left:34.9 Right:34.9

Beam Angle(50%Imax):C0/180Left:17.8 Right:17.8

:C90/270Left:17.8 Right:17.8







House

[Unit:cd]

Road

Imax:2800.31

(10%Imax) 280.031

(20%Imax) 560.063

(30%Imax) 840.094

(40%Imax) 1120.13

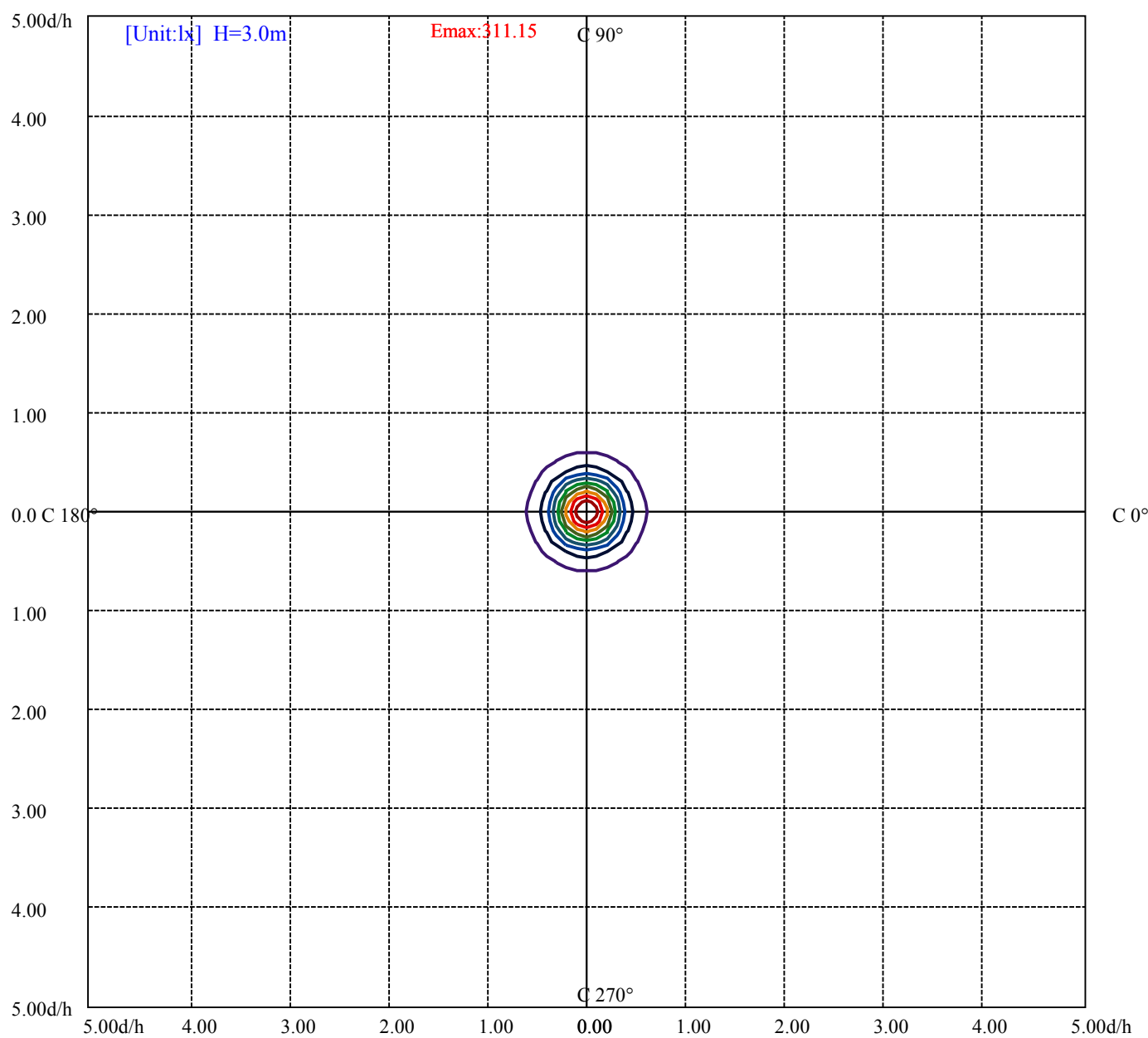
(50%Imax) 1400.16

(60%Imax) 1680.19

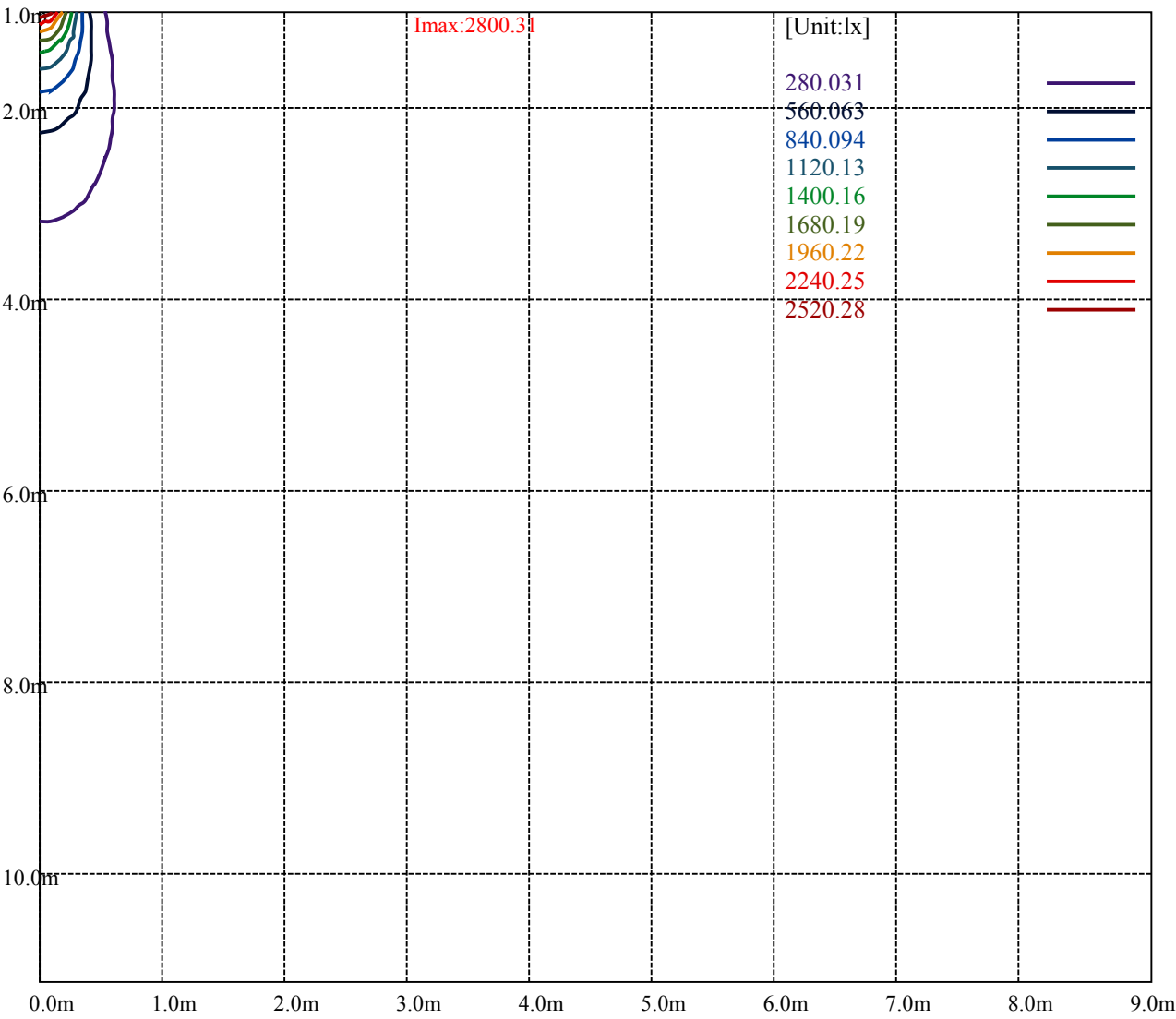
(70%Imax) 1960.22

(80%Imax) 2240.25

(90%Imax) 2520.28



(10%E _{max})	31.11456	—
(20%E _{max})	62.22922	—
(30%E _{max})	93.34378	—
(40%E _{max})	124.4589	—
(50%E _{max})	155.5733	—
(60%E _{max})	186.6878	—
(70%E _{max})	217.8022	—
(80%E _{max})	248.9167	—
(90%E _{max})	280.0311	—



Luminance Table

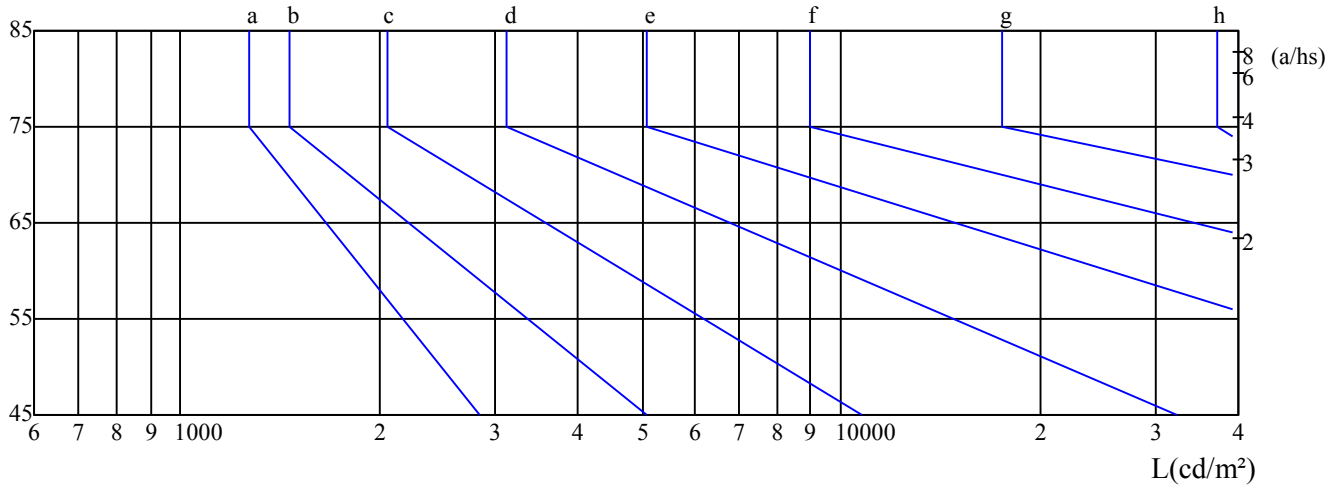
γ	45	50	55	60	65	70	75	80	85
C0	493	362	307	273	254	242	237	241	247
C45	422	306	256	224	204	191	183	181	180
C90	493	362	307	273	254	242	237	241	247

L(Hor)(65)	L(Ver)(65)	L45(65)	L(Hor)(75)	L(Ver)(75)	L45(75)	L(Hor)(85)	L(Ver)(85)	L45(85)
619	619	619	831	831	831	2137	2137	2137

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

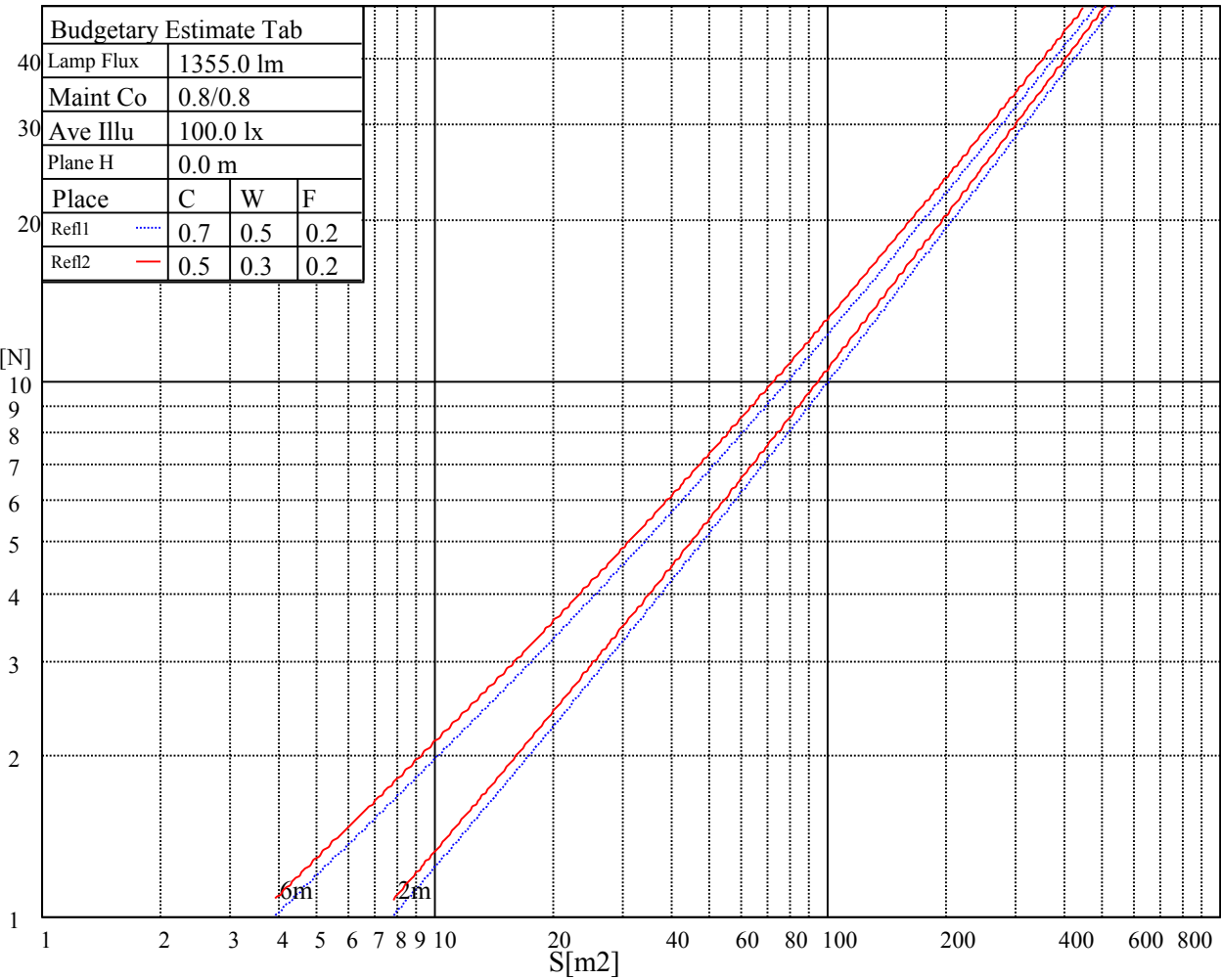
Luminance Limiting Curve

 $\gamma(^{\circ})$ 

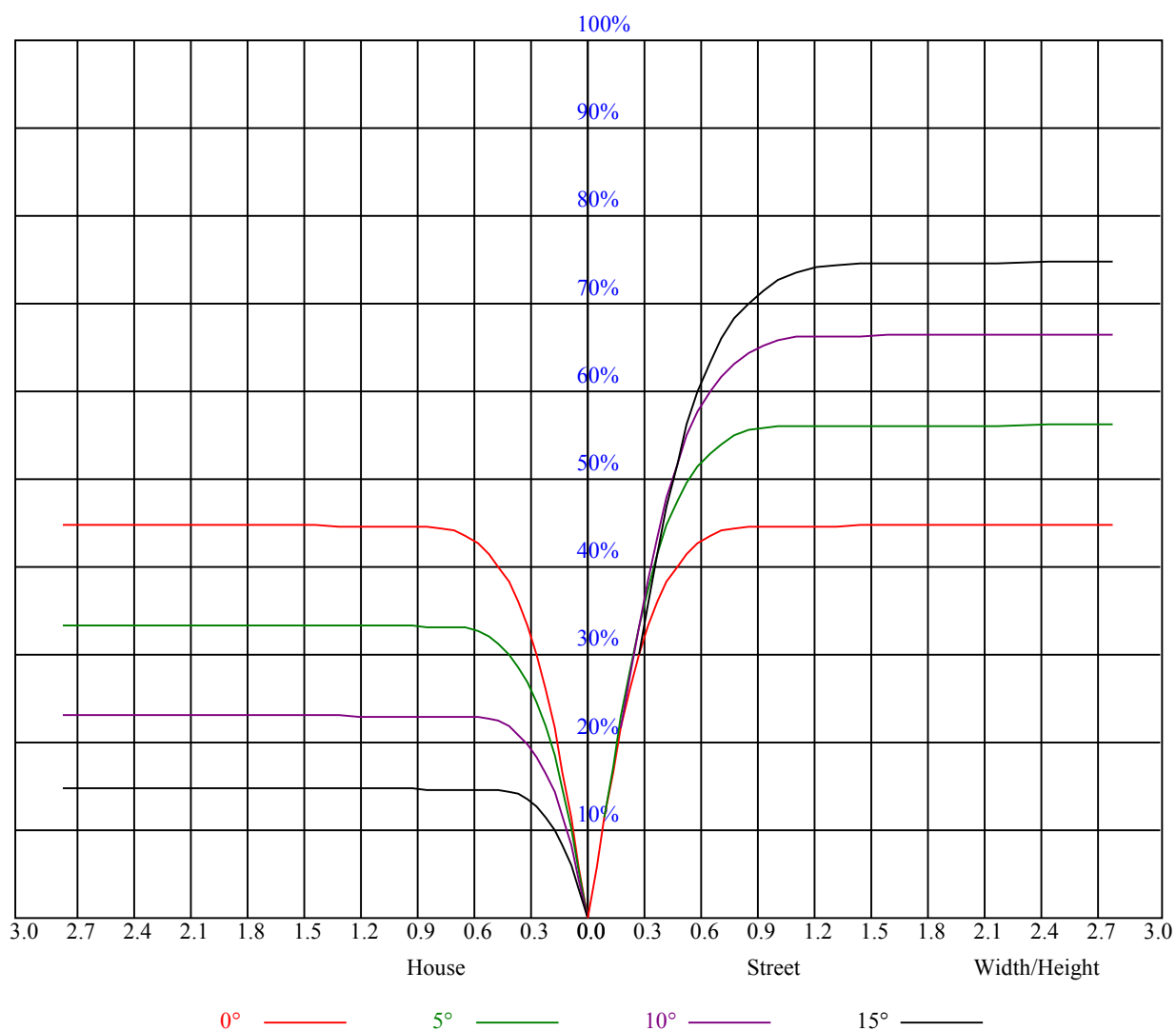
C0 ———

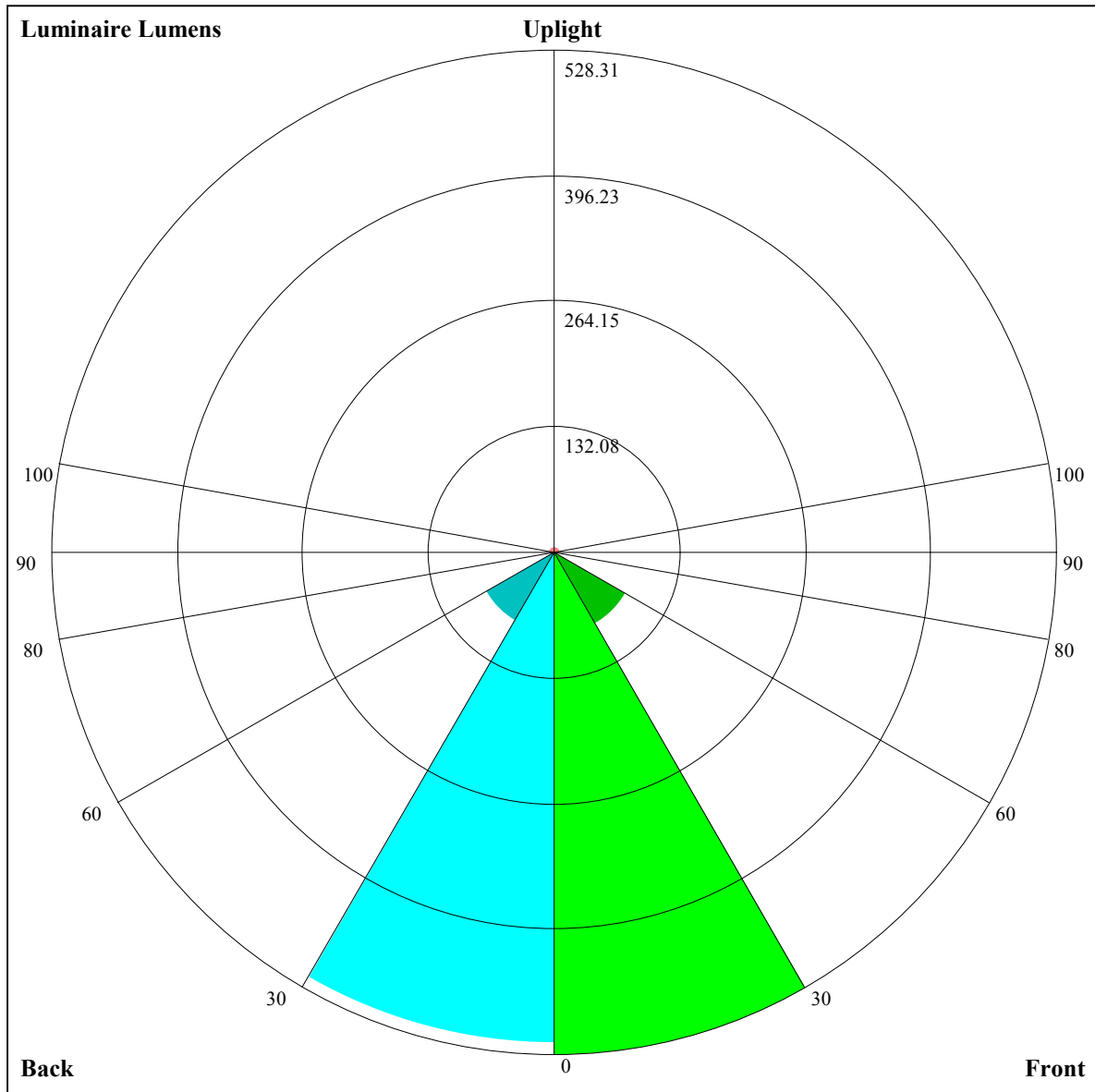
C45 ———

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	1.07	1.07	1.07	1.04	1.04	1.04	1.00	1.00	1.00	0.95	0.95	0.95	0.92	0.92	0.92	0.90
1	1.00	0.98	0.97	0.98	0.97	0.95	0.95	0.93	0.92	0.92	0.90	0.89	0.89	0.88	0.87	0.85
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	0.83	0.81
3	0.90	0.86	0.83	0.89	0.85	0.82	0.86	0.83	0.81	0.84	0.82	0.80	0.82	0.80	0.79	0.77
4	0.85	0.81	0.78	0.84	0.80	0.77	0.82	0.79	0.77	0.81	0.78	0.76	0.79	0.77	0.75	0.74
5	0.81	0.77	0.74	0.80	0.76	0.73	0.79	0.75	0.73	0.77	0.74	0.72	0.76	0.74	0.71	0.70
6	0.77	0.73	0.70	0.77	0.73	0.70	0.76	0.72	0.69	0.74	0.71	0.69	0.73	0.70	0.68	0.67
7	0.74	0.70	0.66	0.73	0.69	0.66	0.72	0.69	0.66	0.71	0.68	0.66	0.71	0.68	0.65	0.64
8	0.71	0.66	0.63	0.70	0.66	0.63	0.70	0.66	0.63	0.69	0.65	0.63	0.68	0.65	0.63	0.62
9	0.68	0.64	0.61	0.68	0.63	0.61	0.67	0.63	0.60	0.66	0.63	0.60	0.65	0.62	0.60	0.59
10	0.65	0.61	0.58	0.65	0.61	0.58	0.64	0.61	0.58	0.64	0.60	0.58	0.63	0.60	0.58	0.57





Luminaire Lumens:

FL=528.31,FM=86.48,FH=1.78,FVH=0.75

BL=515.34,BM=83.77,BH=1.74,BVH=0.75

UL=1.54,UH=7.32

BUG Rating:B2-U1-G0

NATA 3-2046-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	2802.34	2808.84	2804.20	2790.74	2766.15	2731.81	2683.55	2617.20	2529.96
45.0	2791.67	2797.24	2797.24	2790.74	2775.89	2752.23	2711.86	2652.46	2571.72
90.0	2795.38	2774.04	2748.05	2722.99	2679.84	2621.37	2543.41	2449.68	2346.20
135.0	2813.02	2803.27	2779.61	2744.80	2701.19	2647.82	2580.07	2498.40	2402.35
180.0	2802.34	2784.25	2754.55	2716.03	2670.56	2626.94	2549.45	2469.17	2395.85
225.0	2791.67	2779.61	2761.51	2735.99	2703.51	2661.74	2604.67	2529.96	2477.06
270.0	2793.06	2804.20	2806.98	2800.02	2784.71	2761.97	2732.74	2691.90	2637.15
315.0	2813.02	2810.70	2787.96	2756.41	2732.28	2684.94	2627.87	2561.05	2481.70
360.0	2802.34	2808.84	2804.20	2790.74	2766.15	2731.81	2683.55	2617.20	2529.96
C/ γ (°)	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0
0.0	2425.55	2312.33	2196.32	2078.45	1960.59	1888.20	1767.09	1596.79	1523.47
45.0	2517.43	2377.29	2271.95	2206.53	2097.01	1980.54	1855.25	1722.54	1582.86
90.0	2238.54	2128.10	2013.95	1891.91	1767.09	1642.26	1516.51	1388.90	1262.68
135.0	2295.16	2182.86	2074.28	1966.62	1858.04	1747.60	1636.69	1524.40	1413.03
180.0	2269.63	2161.05	2075.67	1970.33	1864.53	1759.20	1651.54	1545.28	1437.16
225.0	2339.24	2276.59	2173.12	2027.41	1963.37	1852.93	1734.14	1612.10	1487.27
270.0	2565.69	2479.84	2380.07	2272.42	2161.05	2047.83	1935.53	1821.84	1702.59
315.0	2390.28	2288.66	2185.64	2080.77	1972.65	1859.89	1743.88	1628.80	1514.65
360.0	2425.55	2312.33	2196.32	2078.45	1960.59	1888.20	1767.09	1596.79	1523.47
C/ γ (°)	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0	26.0
0.0	1401.89	1282.17	1166.63	910.20	870.39	851.59	761.39	682.96	629.55
45.0	1441.80	1302.12	1169.41	1048.76	941.11	845.52	759.21	683.10	619.07
90.0	1141.57	889.97	889.97	871.13	781.25	702.50	635.54	580.23	536.19
135.0	1304.44	1219.99	1097.49	1018.14	922.08	813.50	747.14	673.36	612.11
180.0	1327.65	1220.45	1118.37	1019.06	924.87	834.38	752.71	679.39	617.67
225.0	1362.45	1236.70	1120.22	903.71	903.71	817.16	769.23	695.49	608.53
270.0	1582.40	1510.01	1389.83	1221.85	1152.24	1040.41	939.25	844.12	758.74
315.0	1402.82	1335.53	1178.23	1113.73	893.45	893.45	799.95	717.81	646.91
360.0	1401.89	1282.17	1166.63	910.20	870.39	851.59	761.39	682.96	629.55
C/ γ (°)	27.0	28.0	29.0	30.0	31.0	32.0	33.0	34.0	35.0
0.0	562.64	519.07	491.46	459.02	438.42	419.76	385.70	340.04	285.29
45.0	566.17	523.48	490.07	464.54	442.73	413.04	380.55	333.22	282.18
90.0	501.53	473.87	451.69	427.14	387.93	339.25	287.05	232.06	176.70
135.0	560.60	521.16	488.67	463.62	439.49	407.00	368.02	319.77	258.51
180.0	565.70	525.33	493.31	476.61	453.41	408.86	382.87	333.22	276.61
225.0	557.58	532.94	498.56	471.32	447.89	411.23	363.34	311.46	258.75
270.0	682.64	618.14	563.38	521.16	487.28	460.83	438.56	404.68	359.21
315.0	586.72	537.17	497.58	467.10	444.17	421.90	390.44	349.83	295.17
360.0	562.64	519.07	491.46	459.02	438.42	419.76	385.70	340.04	285.29
C/ γ (°)	36.0	37.0	38.0	39.0	40.0	41.0	42.0	43.0	44.0
0.0	226.26	165.57	107.98	61.58	29.98	14.15	10.30	7.19	5.48
45.0	230.21	230.21	125.57	78.98	39.35	15.36	10.58	7.10	5.34
90.0	123.66	74.85	35.17	16.19	9.51	7.33	5.20	3.90	3.39
135.0	244.59	160.18	81.72	44.13	20.23	10.12	7.84	5.80	4.69
180.0	252.02	239.49	92.25	47.47	21.39	10.30	7.98	5.89	4.64
225.0	206.49	154.38	104.73	60.09	26.40	11.14	8.72	6.31	4.78
270.0	308.16	254.34	232.06	232.06	102.09	57.35	24.22	11.83	9.05
315.0	255.22	153.22	96.70	70.67	37.91	17.45	10.86	8.07	5.80
360.0	226.26	165.57	107.98	61.58	29.98	14.15	10.30	7.19	5.48

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	4.22	3.85	3.62	3.48	3.39	3.25	3.11	2.92	2.92
45.0	3.81	3.53	3.29	3.20	3.11	3.02	2.92	2.78	2.64
90.0	3.29	3.20	3.02	2.88	2.78	2.74	2.60	2.41	2.37
135.0	3.81	3.43	3.29	3.20	3.06	2.92	2.78	2.78	2.64
180.0	3.76	3.62	3.34	3.20	3.11	3.02	2.92	2.74	2.69
225.0	3.90	3.53	3.34	3.25	3.11	2.97	2.83	2.74	2.64
270.0	6.40	4.92	3.94	3.53	3.39	3.20	3.06	3.02	2.83
315.0	4.45	3.71	3.57	3.43	3.25	3.11	3.06	2.97	2.78
360.0	4.22	3.85	3.62	3.48	3.39	3.25	3.11	2.92	2.92
C/ γ (°)	54.0	55.0	56.0	57.0	58.0	59.0	60.0	61.0	62.0
0.0	2.78	2.69	2.64	2.55	2.41	2.32	2.32	2.27	2.18
45.0	2.55	2.51	2.46	2.32	2.23	2.23	2.18	2.04	1.95
90.0	2.37	2.27	2.13	2.04	2.09	2.00	2.00	1.95	1.81
135.0	2.51	2.37	2.37	2.32	2.23	2.09	2.04	2.04	1.95
180.0	2.64	2.46	2.37	2.37	2.27	2.18	2.13	2.09	2.00
225.0	2.55	2.41	2.32	2.32	2.18	2.13	2.04	2.04	2.00
270.0	2.69	2.64	2.60	2.41	2.46	2.27	2.18	2.18	2.13
315.0	2.64	2.60	2.51	2.37	2.32	2.27	2.18	2.18	2.09
360.0	2.78	2.69	2.64	2.55	2.41	2.32	2.32	2.27	2.18
C/ γ (°)	63.0	64.0	65.0	66.0	67.0	68.0	69.0	70.0	71.0
0.0	2.09	2.04	2.00	1.90	1.86	1.86	1.86	1.76	1.72
45.0	1.95	1.95	1.86	1.81	1.81	1.81	1.76	1.62	1.62
90.0	1.81	1.81	1.81	1.67	1.67	1.67	1.62	1.58	1.58
135.0	1.90	1.81	1.81	1.86	1.76	1.67	1.67	1.67	1.67
180.0	1.90	1.90	1.90	1.81	1.72	1.76	1.76	1.72	1.67
225.0	1.90	1.90	1.86	1.81	1.76	1.72	1.72	1.72	1.67
270.0	2.04	1.95	1.90	1.95	1.86	1.81	1.86	1.81	1.67
315.0	2.00	2.00	2.00	1.86	1.81	1.86	1.81	1.72	1.72
360.0	2.09	2.04	2.00	1.90	1.86	1.86	1.86	1.76	1.72
C/ γ (°)	72.0	73.0	74.0	75.0	76.0	77.0	78.0	79.0	80.0
0.0	1.72	1.67	1.62	1.62	1.53	1.53	1.48	1.48	1.53
45.0	1.62	1.62	1.62	1.53	1.53	1.53	1.48	1.39	1.44
90.0	1.58	1.53	1.44	1.44	1.48	1.44	1.39	1.35	1.44
135.0	1.58	1.53	1.53	1.58	1.48	1.44	1.44	1.44	1.44
180.0	1.67	1.58	1.58	1.53	1.48	1.48	1.53	1.44	1.39
225.0	1.58	1.58	1.62	1.53	1.53	1.48	1.53	1.48	1.39
270.0	1.67	1.72	1.62	1.58	1.58	1.58	1.48	1.44	1.48
315.0	1.72	1.62	1.58	1.62	1.62	1.53	1.48	1.48	1.48
360.0	1.72	1.67	1.62	1.62	1.53	1.53	1.48	1.48	1.53
C/ γ (°)	81.0	82.0	83.0	84.0	85.0	86.0	87.0	88.0	89.0
0.0	1.44	1.48	1.39	1.44	1.35	1.35	1.39	1.35	1.30
45.0	1.44	1.39	1.35	1.35	1.39	1.35	1.39	1.30	1.35
90.0	1.39	1.35	1.35	1.30	1.35	1.39	1.30	1.39	1.53
135.0	1.44	1.35	1.39	1.39	1.30	1.39	1.39	1.39	1.39
180.0	1.44	1.39	1.39	1.30	1.39	1.35	1.35	1.30	1.25
225.0	1.39	1.44	1.30	1.35	1.35	1.30	1.30	1.30	1.30
270.0	1.44	1.39	1.39	1.39	1.30	1.35	1.30	1.30	1.35
315.0	1.48	1.39	1.35	1.35	1.35	1.30	1.35	1.35	1.35
360.0	1.44	1.48	1.39	1.44	1.35	1.35	1.39	1.35	1.30

Intensity data(cd)

Appendix Page: 19 Total:19

C/ γ (°)	90.0
0.0	1.35
45.0	1.53
90.0	1.72
135.0	1.39
180.0	1.35
225.0	1.35
270.0	1.30
315.0	1.30
360.0	1.35