
SOTEN

Client:

LumCAT: 1709-M

Luminaire: 92.70.124.00

Report No: nata-0100

Test No: Hua

LampCAT: SEOUL SAWx10

Lamp flux(lm): 1550.0

Number of Lamps: 1

Length(mm): 46

Phm Type: C

Voltage(V): 220.4000

Current(A): 0.0690

Power (W): 14.0900

PF: 0.9240

Ballast type: AC

Width(mm): 46

Height(mm): 0

Photometric Results

Lumens(lm): 1420.48, Efficiency(%): 91.64% , Luminous Efficacy(lm/W): 100.82

Central intensity(cd): 5786.195, Maximum intensity(cd): 5786.195

Angle of maximum intensity: C=0.0 γ =0.0

Beam Angle(50%Imax): [C0/180]Total=17.6

[C90/270]Total=17.6

Field angle(10%Imax): [C0/180]Total=53.2

[C90/270]Total=53.2

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

Maximum s/h(1/4): C0_180=0.32 C90_270=0.32

Up flux rate of lamp(%): 0.00%

Down flux rate of lamp(%): 91.73%

Up flux rate of LUM(%): - -

Down flux rate of LUM(%): 100.00%

CIE Type : Direct lighting

Output flux ratio in π solid angle : 99.802%

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Zonal flux distribution table

Appendix Page: 2 Total:19

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
0.0	5786.195	1.384	1.384	.089%	.097%
1.0	5744.142	10.993	12.378	.709%	.871%
2.0	5626.916	21.535	33.913	1.389%	2.387%
3.0	5402.266	31.005	64.917	2.000%	4.570%
4.0	5099.020	39.005	103.923	2.516%	7.316%
5.0	4702.097	44.941	148.863	2.899%	10.480%
6.0	4279.653	49.056	197.919	3.165%	13.933%
7.0	3722.987	49.755	247.675	3.210%	17.436%
8.0	3251.819	49.629	297.303	3.202%	20.930%
9.0	2808.029	48.171	345.474	3.108%	24.321%
10.0	2346.431	44.682	390.156	2.883%	27.466%
11.0	2018.882	42.244	432.4	2.725%	30.440%
12.0	1710.474	38.998	471.398	2.516%	33.186%
13.0	1474.513	36.374	507.772	2.347%	35.746%
14.0	1285.593	34.106	541.878	2.200%	38.147%
15.0	1111.453	31.546	573.423	2.035%	40.368%
16.0	1016.355	30.721	604.144	1.982%	42.531%
17.0	933.467	29.929	634.073	1.931%	44.638%
18.0	874.749	29.643	663.716	1.912%	46.725%
19.0	817.581	29.189	692.905	1.883%	48.780%
20.0	771.757	28.946	721.851	1.867%	50.817%
21.0	734.060	28.848	750.699	1.861%	52.848%
22.0	698.771	28.705	779.404	1.852%	54.869%
23.0	666.352	28.552	807.956	1.842%	56.879%
24.0	638.058	28.459	836.415	1.836%	58.882%
25.0	612.890	28.404	864.819	1.833%	60.882%
26.0	591.341	28.427	893.246	1.834%	62.883%
27.0	571.573	28.456	921.702	1.836%	64.887%
28.0	556.579	28.654	950.356	1.849%	66.904%
29.0	544.201	28.932	979.288	1.867%	68.941%
30.0	532.496	29.197	1008.485	1.884%	70.996%
31.0	521.521	29.455	1037.941	1.900%	73.070%
32.0	511.603	29.730	1067.671	1.918%	75.163%
33.0	501.980	29.981	1097.652	1.934%	77.273%
34.0	492.560	30.205	1127.856	1.949%	79.399%
35.0	483.668	30.422	1158.278	1.963%	81.541%
36.0	473.030	30.490	1188.768	1.967%	83.688%
37.0	460.379	30.383	1219.151	1.960%	85.827%

Equipment: GMS 1800
Temperature($^{\circ}$ C): 25.0

Date: 2017/7/18
Humidity(%): 60.0%

Operator: 01
Distance(m): 6.81

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Zonal flux distribution table

Appendix Page: 3 Total:19

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
38.0	441.273	29.792	1248.944	1.922%	87.924%
39.0	410.890	28.356	1277.3	1.829%	89.920%
40.0	374.046	26.366	1303.666	1.701%	91.776%
41.0	334.812	24.088	1327.754	1.554%	93.472%
42.0	285.091	20.919	1348.673	1.350%	94.945%
43.0	241.257	18.043	1366.716	1.164%	96.215%
44.0	206.704	15.746	1382.462	1.016%	97.323%
45.0	159.424	12.362	1394.824	.798%	98.194%
46.0	115.022	9.073	1403.897	.585%	98.832%
47.0	69.941	5.609	1409.507	.362%	99.227%
48.0	40.667	3.314	1412.821	.214%	99.461%
49.0	23.985	1.985	1414.806	.128%	99.600%
50.0	15.238	1.280	1416.086	.083%	99.690%
51.0	10.528	0.897	1416.983	.058%	99.754%
52.0	7.303	0.631	1417.614	.041%	99.798%
53.0	4.501	0.394	1418.008	.025%	99.826%
54.0	3.005	0.267	1418.275	.017%	99.845%
55.0	2.094	0.188	1418.463	.012%	99.858%
56.0	1.497	0.136	1418.599	.009%	99.867%
57.0	1.264	0.116	1418.715	.008%	99.876%
58.0	1.056	0.098	1418.814	.006%	99.882%
59.0	1.015	0.095	1418.909	.006%	99.889%
60.0	0.963	0.091	1419	.006%	99.896%
61.0	0.893	0.086	1419.086	.006%	99.902%
62.0	0.841	0.081	1419.168	.005%	99.907%
63.0	0.806	0.079	1419.246	.005%	99.913%
64.0	0.760	0.075	1419.321	.005%	99.918%
65.0	0.667	0.066	1419.388	.004%	99.923%
66.0	0.609	0.061	1419.449	.004%	99.927%
67.0	0.534	0.054	1419.502	.003%	99.931%
68.0	0.499	0.051	1419.553	.003%	99.935%
69.0	0.481	0.049	1419.602	.003%	99.938%
70.0	0.476	0.049	1419.651	.003%	99.941%
71.0	0.452	0.047	1419.698	.003%	99.945%
72.0	0.429	0.045	1419.743	.003%	99.948%
73.0	0.423	0.044	1419.788	.003%	99.951%
74.0	0.383	0.040	1419.828	.003%	99.954%
75.0	0.383	0.041	1419.868	.003%	99.957%

Equipment: GMS 1800
Temperature($^{\circ}$ C): 25.0

Date: 2017/7/18
Humidity(%): 60.0%

Operator: 01
Distance(m): 6.81

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Zonal flux distribution table

Appendix Page: 4 Total:19

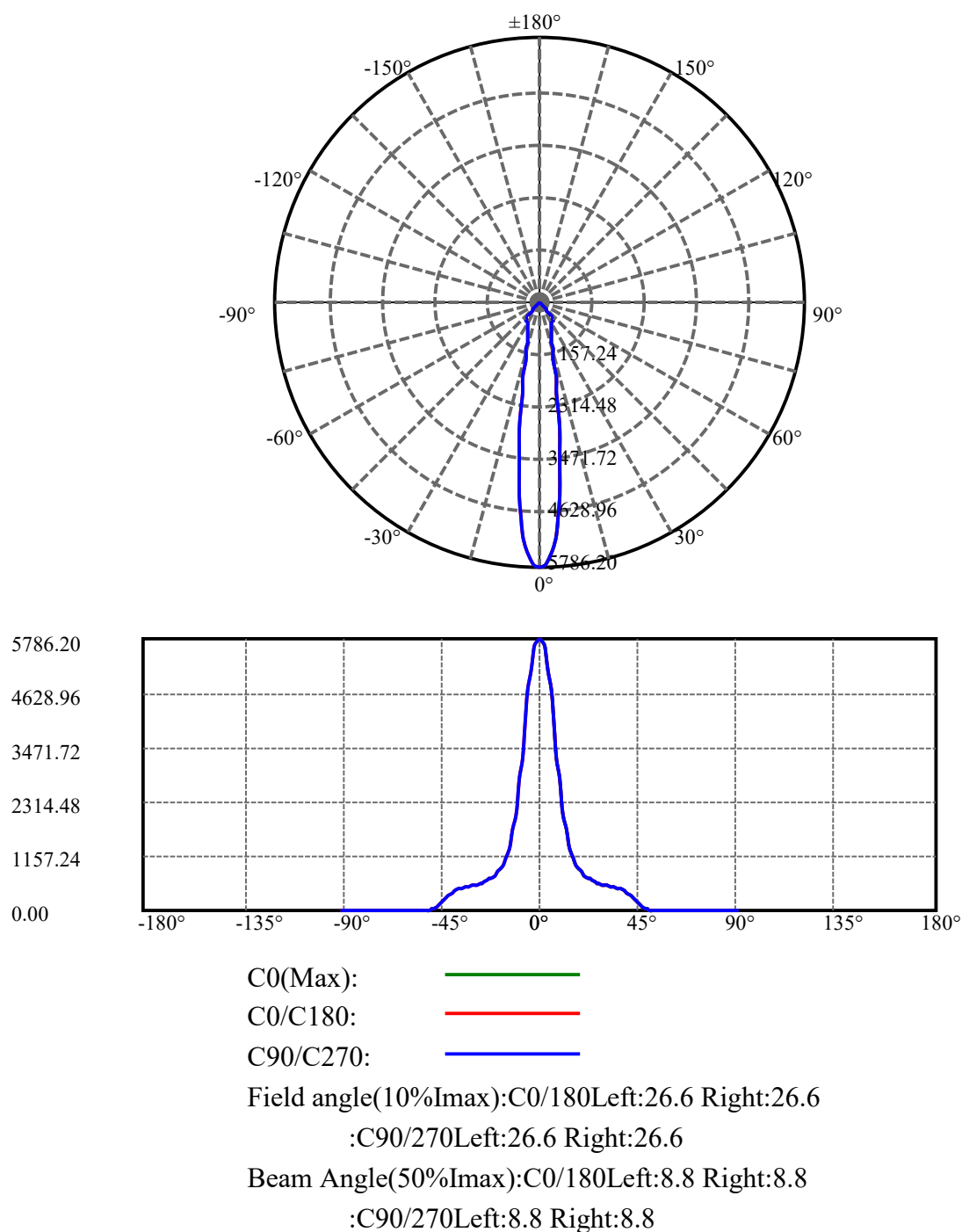
$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
76.0	0.389	0.041	1419.91	.003%	99.960%
77.0	0.365	0.039	1419.949	.003%	99.962%
78.0	0.365	0.039	1419.988	.003%	99.965%
79.0	0.342	0.037	1420.025	.002%	99.968%
80.0	0.354	0.038	1420.063	.002%	99.970%
81.0	0.365	0.040	1420.103	.003%	99.973%
82.0	0.325	0.035	1420.138	.002%	99.976%
83.0	0.371	0.040	1420.178	.003%	99.979%
84.0	0.336	0.037	1420.215	.002%	99.981%
85.0	0.336	0.037	1420.252	.002%	99.984%
86.0	0.383	0.042	1420.294	.003%	99.987%
87.0	0.447	0.049	1420.343	.003%	99.990%
88.0	0.551	0.060	1420.403	.004%	99.994%
89.0	0.493	0.054	1420.457	.003%	99.998%
90.0	0.476	0.026	1420.483	.002%	100.000%

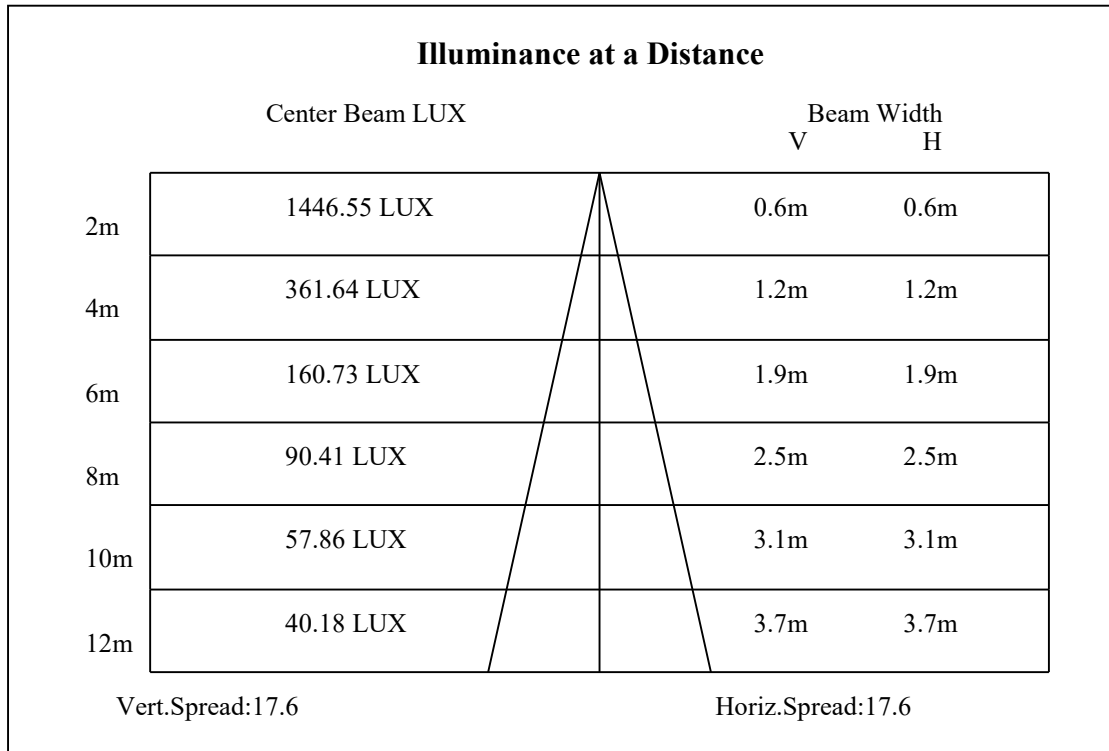
ZONAL LUMEN SUMMARY

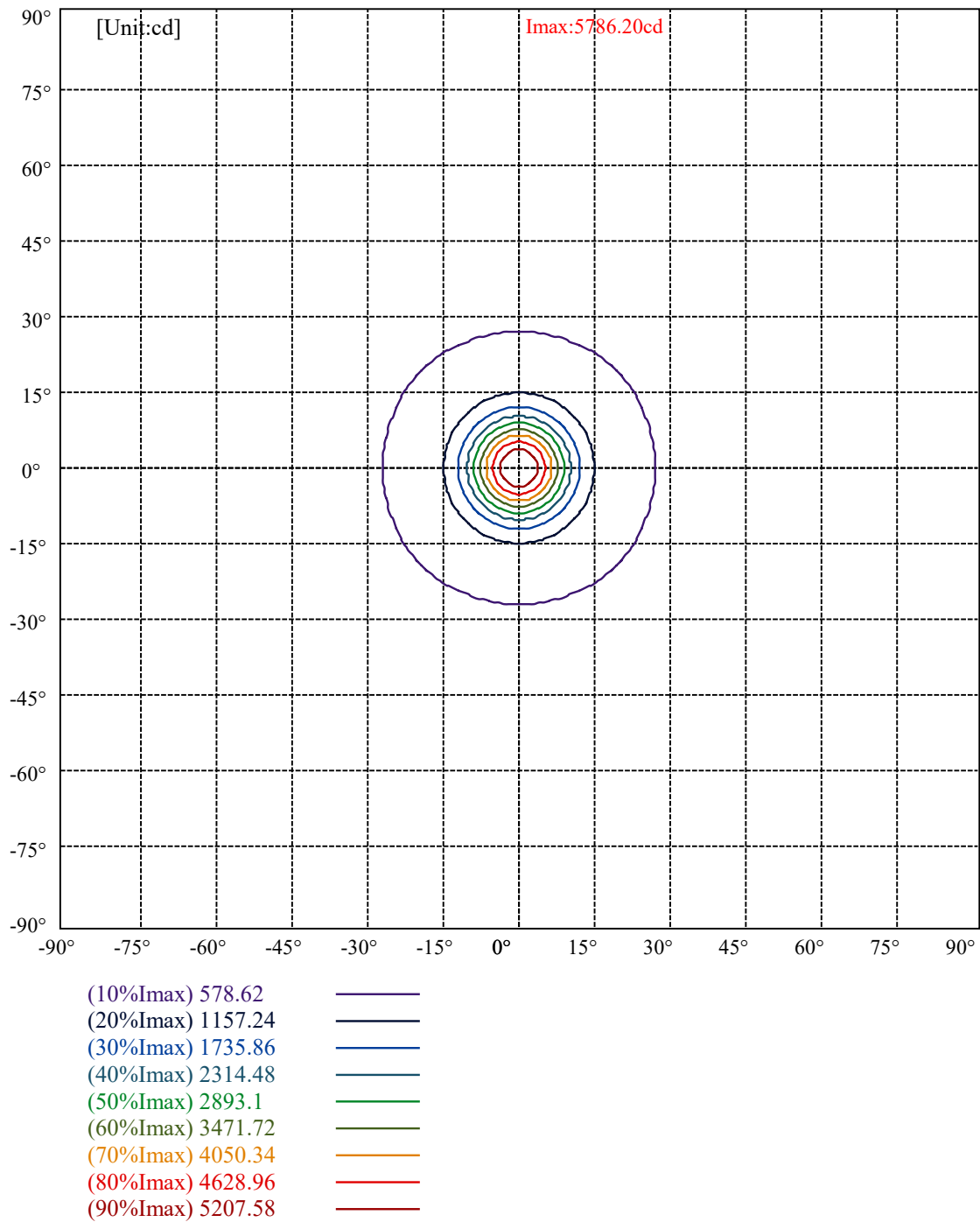
Zone	Lumens	%Lamp	%Fixt
0-30	1008.49	65.06%	71.00%
0-40	1303.67	84.11%	91.78%
0-60	1419.00	91.55%	99.90%
0-90	1420.46	91.64%	100.00%
0-120	1420.46	91.64%	100.00%
0-180	1420.48	91.64%	100.00%
60-90	1.55	0.10%	0.11%
90-120	0.00	0.00%	0.00%
90-130	0.00	0.00%	0.00%
90-150	0.00	0.00%	0.00%
90-180	0.00	0.00%	0.00%
0-34.28	1136.39	73.32%	80.00%

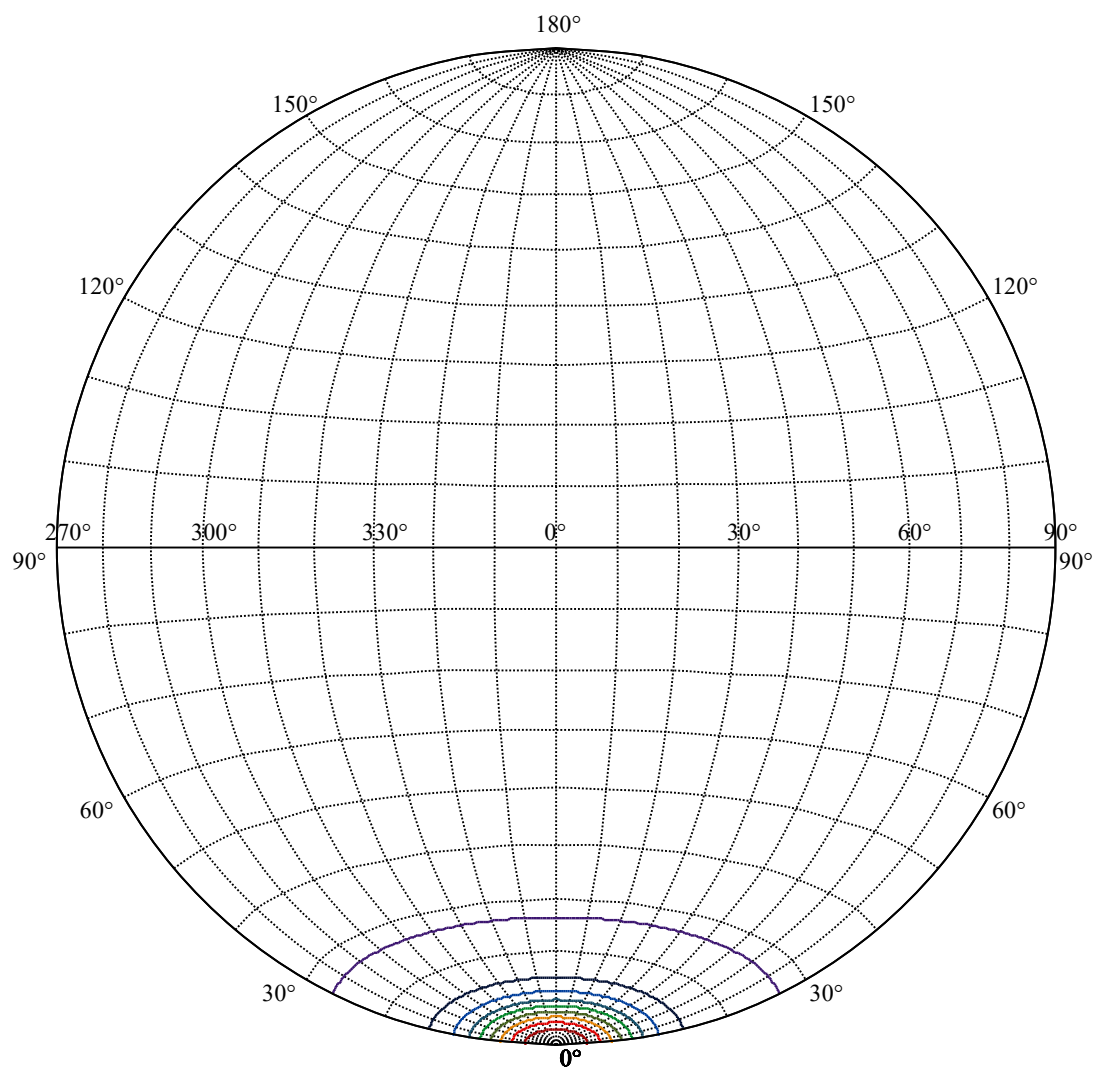
ZONAL LUMEN SUMMARY

0-10	390.16
10-20	331.69
20-30	286.63
30-40	295.18
40-50	112.42
50-60	2.91
60-70	0.65
70-80	0.41
80-90	0.39
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









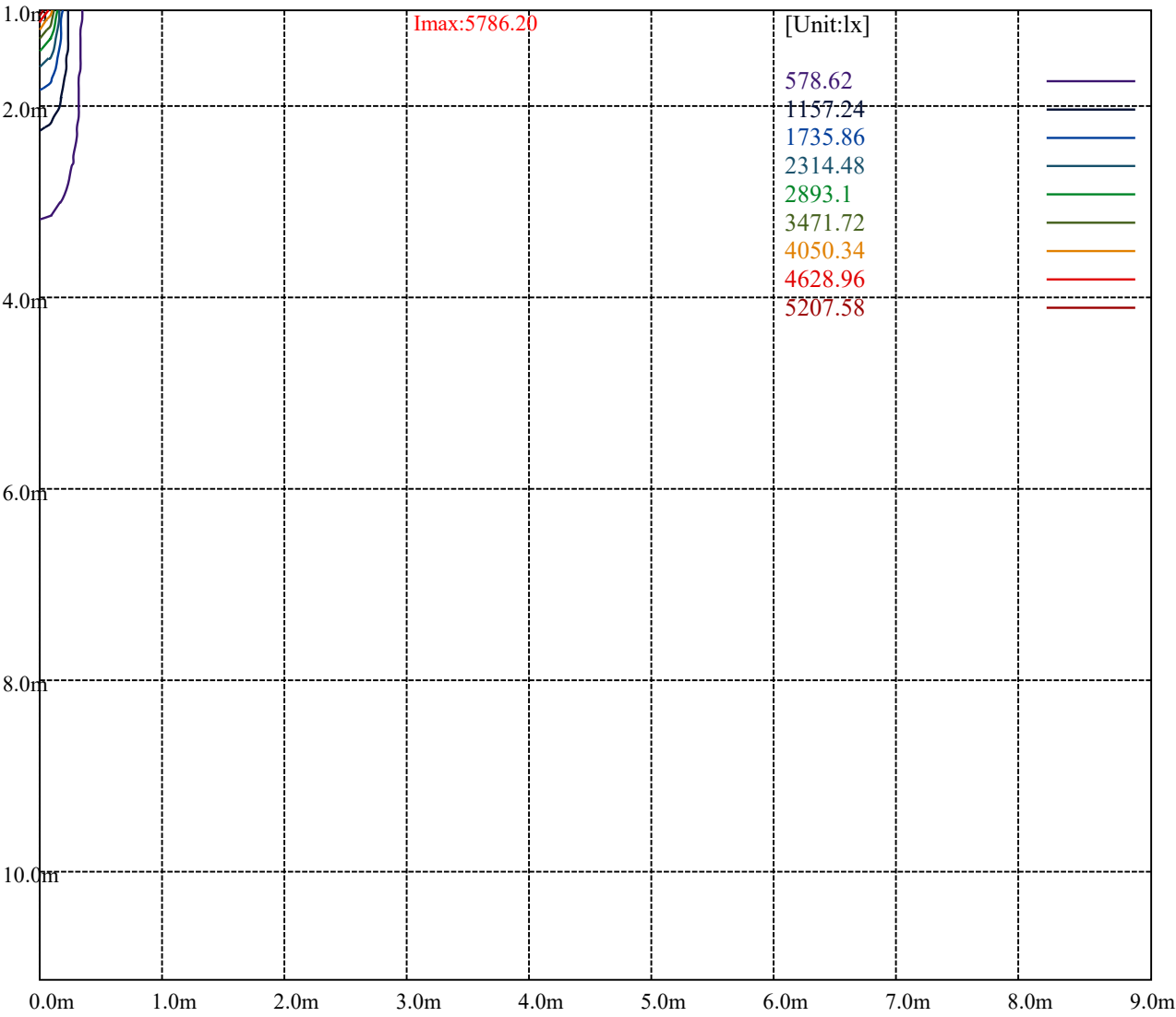
House

[Unit:cd]

Road

Imax:5786.20

(10%Imax)	578.62	—
(20%Imax)	1157.24	—
(30%Imax)	1735.86	—
(40%Imax)	2314.48	—
(50%Imax)	2893.1	—
(60%Imax)	3471.72	—
(70%Imax)	4050.34	—
(80%Imax)	4628.96	—
(90%Imax)	5207.58	—



Luminance Table

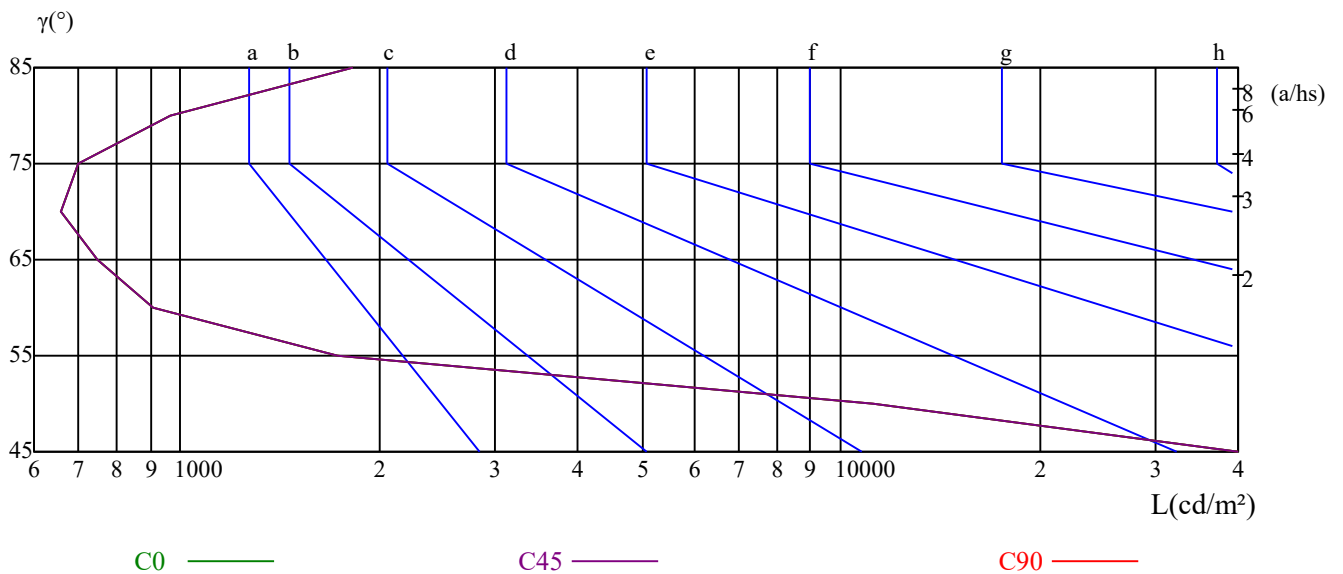
γ	45	50	55	60	65	70	75	80	85
C0	106550	11203	1725	910	746	657	699	963	1824
C45	106550	11203	1725	910	746	657	699	963	1824
C90	106550	11203	1725	910	746	657	699	963	1824

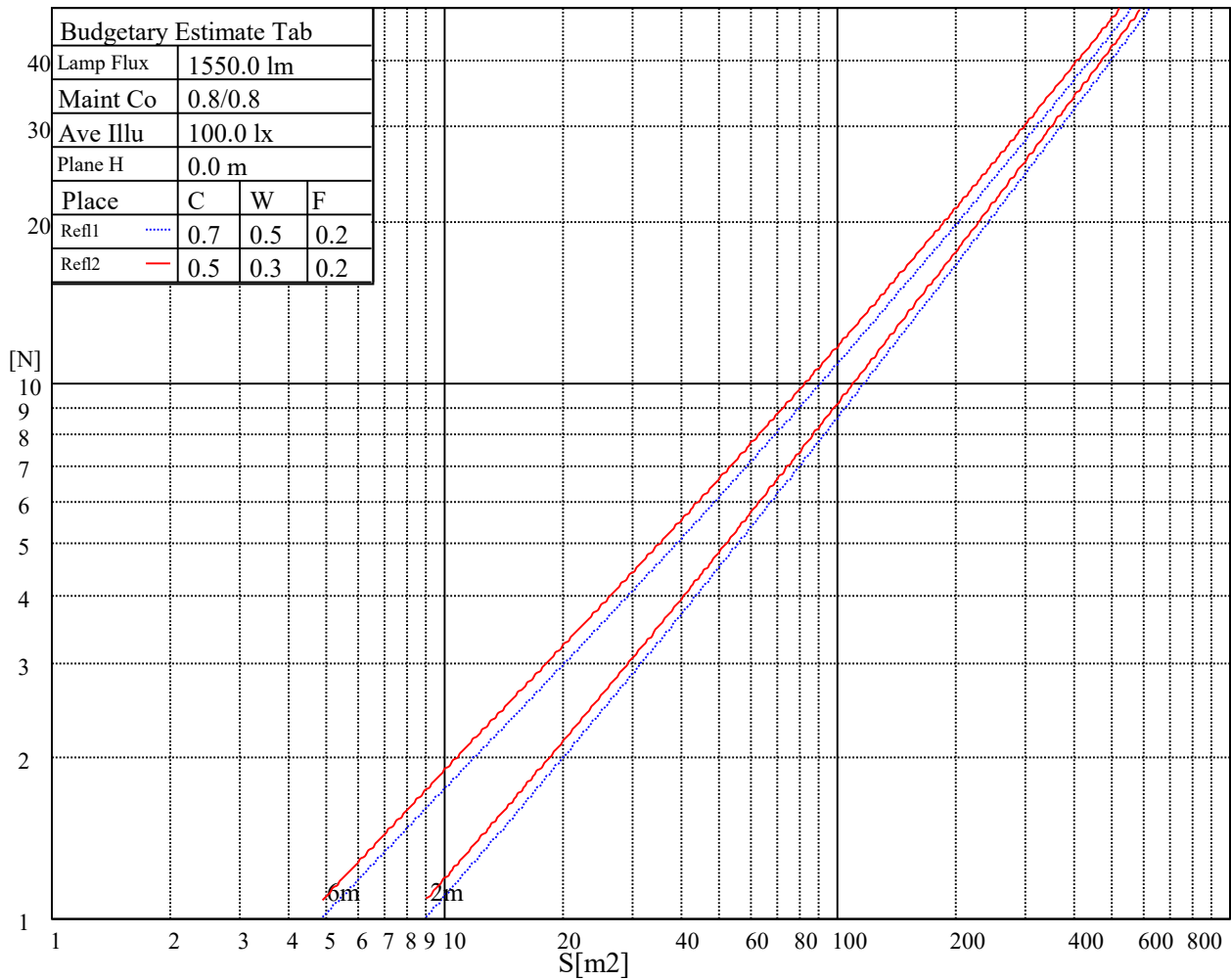
L(Hor)(65)	L(Ver)(65)	L45(65)	L(Hor)(75)	L(Ver)(75)	L45(75)	L(Hor)(85)	L(Ver)(85)	L45(85)
746	746	746	699	699	699	1824	1824	1824

Glare Table

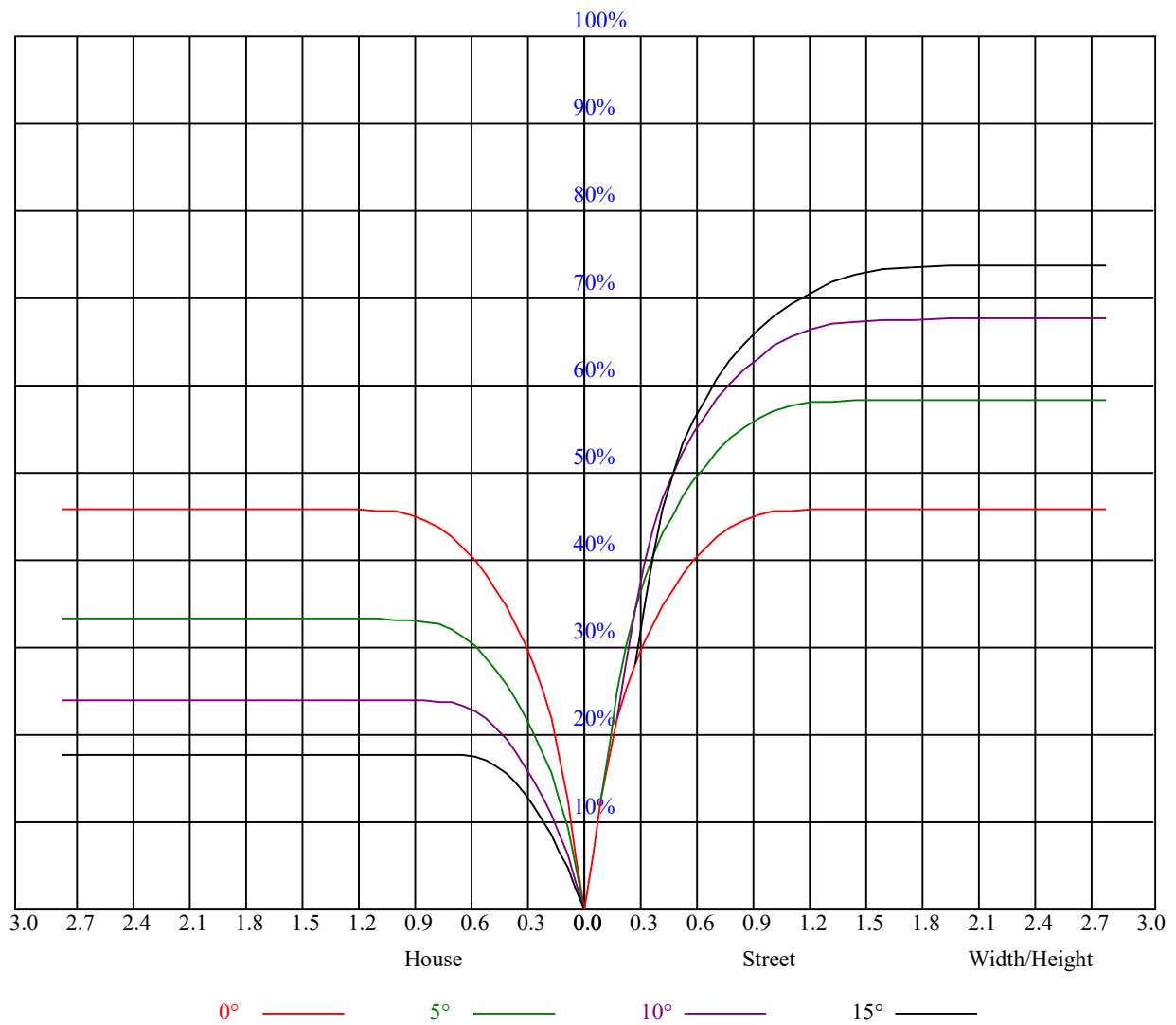
Glare	Quality	Service Values Illuminance(lx)							
1.15	A	2000	1000	500	≤ 300				
1.5	B		2000	1000	500	≤ 300			
1.85	C			2000	1000	500	≤ 300		
2.2	D				2000	1000	500	≤ 300	
2.55	E					2000	1000	500	≤ 300
		a	b	c	d	e	f	g	h

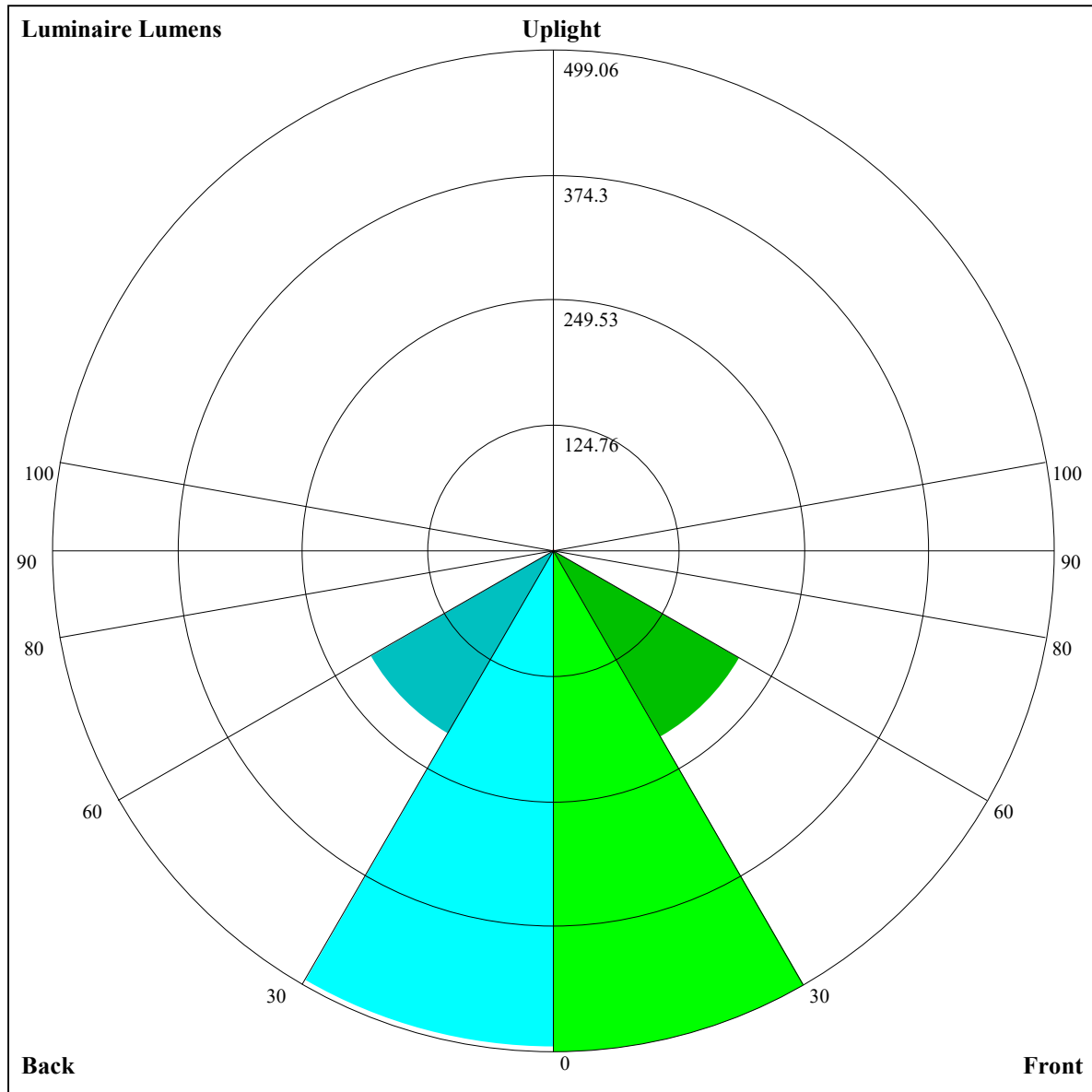
Luminance Limiting Curve





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	1.09	1.09	1.09	1.07	1.07	1.07	1.02	1.02	1.02	0.98	0.98	0.98	0.94	0.94	0.94	0.92
1	1.02	1.00	0.98	1.00	0.98	0.97	0.97	0.95	0.94	0.93	0.92	0.91	0.90	0.89	0.88	0.87
2	0.96	0.92	0.90	0.94	0.91	0.89	0.91	0.89	0.87	0.89	0.87	0.85	0.86	0.85	0.83	0.82
3	0.90	0.86	0.83	0.89	0.85	0.82	0.87	0.83	0.81	0.84	0.82	0.80	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	0.72	0.80	0.75	0.72	0.78	0.74	0.71	0.77	0.73	0.71	0.75	0.72	0.70	0.69
6	0.76	0.71	0.68	0.76	0.71	0.68	0.74	0.70	0.67	0.73	0.70	0.67	0.72	0.69	0.66	0.65
7	0.73	0.68	0.64	0.72	0.67	0.64	0.71	0.67	0.64	0.70	0.66	0.63	0.69	0.66	0.63	0.62
8	0.69	0.64	0.61	0.69	0.64	0.61	0.68	0.64	0.61	0.67	0.63	0.60	0.66	0.63	0.60	0.59
9	0.66	0.61	0.58	0.66	0.61	0.58	0.65	0.61	0.58	0.64	0.60	0.58	0.64	0.60	0.58	0.56
10	0.64	0.59	0.56	0.63	0.59	0.56	0.62	0.58	0.55	0.62	0.58	0.55	0.61	0.58	0.55	0.54





Luminaire Lumens:

FL=499.06,FM=214.34,FH=0.56,FVH=0.2

BL=493.97,BM=211.15,BH=0.51,BVH=0.22

UL=0.52,UH=2.47

BUG Rating:B1-U1-G0

SOTEN 1709-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	5828.77	5766.13	5624.60	5390.26	5042.23	4593.05	4293.75	3566.61	3074.73		
45.0	5748.96	5836.19	5839.44	5742.00	5567.06	5356.38	4988.87	4529.48	4015.33		
90.0	5821.35	5809.28	5713.23	5517.40	5225.53	4844.56	4570.31	3836.21	3514.64		
135.0	5745.71	5782.83	5748.03	5629.70	5423.21	5107.66	4688.18	4194.91	3673.34		
180.0	5828.77	5797.22	5690.49	5509.05	5222.28	4828.31	4348.50	3833.43	3325.31		
225.0	5748.96	5591.19	5348.96	4996.29	4547.57	4027.86	3506.75	3016.26	2565.69		
270.0	5821.35	5752.20	5601.86	5358.70	5017.18	4592.12	4093.29	3568.46	3068.24		
315.0	5745.71	5618.10	5448.73	5074.72	4747.11	4266.83	3747.58	3238.54	2777.29		
360.0	5828.77	5766.13	5624.60	5390.26	5042.23	4593.05	4293.75	3566.61	3074.73		
C/γ(°)	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0		
0.0	2803.27	2231.58	2011.17	1705.37	1465.93	1277.99	1135.07	901.90	901.90		
45.0	3489.11	2997.24	2553.62	2158.27	1821.84	1552.24	1342.96	1181.94	1057.58		
90.0	3015.34	2397.24	2163.37	1819.52	1539.71	1327.65	1170.80	1018.14	907.60		
135.0	3178.68	2722.07	2304.44	1939.24	1640.40	1407.00	1228.34	1142.03	988.44		
180.0	2839.00	2402.35	2023.70	1700.73	1453.40	1336.46	1131.82	1064.54	971.73		
225.0	2158.73	1812.56	1541.10	1334.61	1177.30	1019.06	922.54	922.54	858.60		
270.0	2620.44	2217.20	1865.00	1577.30	1434.84	1244.58	1058.04	997.72	917.44		
315.0	2359.66	1991.21	1688.66	1448.76	1262.68	1119.76	902.03	902.03	864.45		
360.0	2803.27	2231.58	2011.17	1705.37	1465.93	1277.99	1135.07	901.90	901.90		
C/γ(°)	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0	26.0		
0.0	848.49	793.68	749.46	711.41	676.70	645.33	617.12	603.10	582.08		
45.0	960.60	883.57	822.78	774.05	733.22	697.49	664.08	645.05	617.67		
90.0	881.71	825.84	778.32	739.58	703.89	669.97	650.81	610.34	595.26		
135.0	938.32	869.18	814.43	768.49	731.36	697.49	665.47	635.31	608.39		
180.0	899.34	820.92	793.54	753.64	716.51	682.64	651.09	622.78	597.26		
225.0	805.56	761.76	724.45	689.32	657.07	628.25	603.06	582.78	566.49		
270.0	852.94	801.90	760.60	725.79	694.24	663.15	634.84	609.79	588.90		
315.0	811.04	783.80	730.48	710.20	677.16	646.49	618.00	593.96	574.66		
360.0	848.49	793.68	749.46	711.41	676.70	645.33	617.12	603.10	582.08		
C/γ(°)	27.0	28.0	29.0	30.0	31.0	32.0	33.0	34.0	35.0		
0.0	565.15	551.36	538.23	526.77	516.33	506.35	496.84	487.93	479.02		
45.0	586.58	575.91	561.06	547.61	534.61	523.48	512.80	503.52	493.78		
90.0	574.01	552.06	543.80	531.36	520.37	510.34	500.32	490.62	481.43		
135.0	585.66	568.49	554.57	540.65	529.04	519.30	509.09	499.35	490.07		
180.0	577.77	562.45	549.00	536.93	526.26	516.52	506.31	496.56	488.67		
225.0	552.29	540.04	529.18	521.06	510.11	500.78	493.04	483.38	473.69		
270.0	571.74	556.89	544.36	533.22	523.01	513.27	503.99	494.71	487.75		
315.0	559.39	545.42	533.41	522.36	512.43	502.78	493.45	484.40	474.94		
360.0	565.15	551.36	538.23	526.77	516.33	506.35	496.84	487.93	479.02		
C/γ(°)	36.0	37.0	38.0	39.0	40.0	41.0	42.0	43.0	44.0		
0.0	469.28	459.02	437.12	403.76	364.08	321.71	275.22	230.02	183.76		
45.0	484.96	475.22	465.94	453.87	429.74	394.01	352.25	307.70	263.15		
90.0	472.39	462.87	449.42	425.29	387.79	347.61	301.44	249.60	203.01		
135.0	481.25	471.50	460.37	439.95	405.15	381.02	320.23	292.85	244.59		
180.0	477.07	465.94	447.84	416.28	377.31	336.47	290.53	244.13	244.13		
225.0	458.42	432.06	395.45	352.99	308.81	264.22	216.05	171.51	126.08		
270.0	475.68	463.62	447.84	415.82	374.52	333.69	284.50	234.38	234.38		
315.0	465.19	452.80	426.21	379.16	344.96	299.77	240.51	199.86	154.52		
360.0	469.28	459.02	437.12	403.76	364.08	321.71	275.22	230.02	183.76		

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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	138.61	97.63	73.97	32.11	22.51	14.99	11.09	7.29	4.64
45.0	243.66	243.66	121.81	88.35	52.34	28.40	16.75	12.71	8.68
90.0	173.27	125.24	85.20	48.77	22.55	16.89	12.90	8.77	5.24
135.0	244.59	135.96	93.13	55.36	29.98	17.49	13.09	9.23	5.80
180.0	148.82	107.24	68.35	36.71	19.40	14.62	9.79	7.56	4.59
225.0	84.08	48.35	25.61	14.52	11.00	7.38	5.48	2.51	1.72
270.0	133.69	92.39	54.25	28.72	20.60	12.20	8.68	6.64	3.16
315.0	108.68	69.70	37.22	20.79	13.50	9.93	6.45	3.71	2.18
360.0	138.61	97.63	73.97	32.11	22.51	14.99	11.09	7.29	4.64
C/γ(°)	54.0	55.0	56.0	57.0	58.0	59.0	60.0	61.0	62.0
0.0	3.48	2.64	1.44	1.30	1.25	1.21	1.16	1.21	1.11
45.0	5.29	3.20	2.69	2.00	1.44	1.39	1.39	1.35	1.16
90.0	3.02	2.32	1.30	1.30	1.30	1.16	1.07	0.97	0.93
135.0	4.18	2.51	2.27	1.95	1.11	1.16	1.07	0.88	0.84
180.0	2.83	2.23	1.07	1.02	0.97	0.84	0.79	0.84	0.74
225.0	1.30	0.84	0.79	0.84	0.70	0.70	0.70	0.65	0.56
270.0	2.51	2.00	1.39	0.84	0.84	0.84	0.74	0.60	0.65
315.0	1.44	1.02	1.02	0.88	0.84	0.84	0.79	0.65	0.74
360.0	3.48	2.64	1.44	1.30	1.25	1.21	1.16	1.21	1.11
C/γ(°)	63.0	64.0	65.0	66.0	67.0	68.0	69.0	70.0	71.0
0.0	1.07	0.97	0.74	0.65	0.56	0.60	0.60	0.60	0.51
45.0	1.16	1.16	1.07	1.02	0.60	0.51	0.56	0.60	0.46
90.0	0.79	0.70	0.65	0.56	0.51	0.42	0.37	0.42	0.46
135.0	0.88	0.84	0.65	0.56	0.60	0.56	0.51	0.46	0.46
180.0	0.70	0.65	0.65	0.65	0.56	0.51	0.51	0.56	0.51
225.0	0.56	0.60	0.51	0.46	0.46	0.51	0.42	0.37	0.42
270.0	0.65	0.60	0.51	0.46	0.56	0.46	0.42	0.37	0.46
315.0	0.65	0.56	0.56	0.51	0.42	0.42	0.46	0.42	0.32
360.0	1.07	0.97	0.74	0.65	0.56	0.60	0.60	0.60	0.51
C/γ(°)	72.0	73.0	74.0	75.0	76.0	77.0	78.0	79.0	80.0
0.0	0.46	0.56	0.51	0.46	0.46	0.51	0.51	0.46	0.51
45.0	0.42	0.46	0.46	0.37	0.37	0.42	0.37	0.32	0.32
90.0	0.46	0.37	0.32	0.42	0.42	0.32	0.28	0.32	0.37
135.0	0.46	0.42	0.37	0.37	0.42	0.37	0.42	0.32	0.32
180.0	0.42	0.46	0.46	0.42	0.46	0.37	0.42	0.46	0.42
225.0	0.42	0.37	0.32	0.37	0.28	0.28	0.37	0.28	0.28
270.0	0.42	0.32	0.28	0.37	0.37	0.28	0.28	0.28	0.37
315.0	0.37	0.42	0.32	0.28	0.32	0.37	0.28	0.28	0.23
360.0	0.46	0.56	0.51	0.46	0.46	0.51	0.51	0.46	0.51
C/γ(°)	81.0	82.0	83.0	84.0	85.0	86.0	87.0	88.0	89.0
0.0	0.56	0.46	0.51	0.51	0.56	0.60	0.65	0.65	0.65
45.0	0.37	0.37	0.37	0.28	0.32	0.32	0.37	0.37	0.28
90.0	0.32	0.28	0.32	0.28	0.28	0.37	0.32	0.37	0.37
135.0	0.28	0.28	0.28	0.28	0.32	0.37	0.37	0.37	0.42
180.0	0.37	0.42	0.46	0.46	0.42	0.46	0.51	0.84	1.25
225.0	0.37	0.28	0.37	0.32	0.37	0.37	0.84	1.02	0.32
270.0	0.32	0.28	0.32	0.28	0.23	0.28	0.28	0.46	0.32
315.0	0.32	0.23	0.32	0.28	0.19	0.28	0.23	0.32	0.32
360.0	0.56	0.46	0.51	0.51	0.56	0.60	0.65	0.65	0.65

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Appendix Page: 19 Total:19

C/γ(°)	90.0
0.0	0.60
45.0	0.37
90.0	0.51
135.0	0.46
180.0	0.60
225.0	0.65
270.0	0.37
315.0	0.23
360.0	0.60