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## SOLERGIE(QINGDAO) RENEWABLE ENERGY CO.,LTD

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LumCAT: LED24W/SL240-G13(840)

Luminaire: LED Tube

Report No: BSR13120505-9

Voltage(V): 229.920

Test No: BSR13120505-9

Current(A): 0.119

LampCAT:

Power (W): 26.237

Lamp flux(lm)

PF: 0.960

Number of Lamps: 1

Ballast type:

Length(mm): 1460

Width(mm): 26

Phm Type: C

Height(mm): 13

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## Photometric Results

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Lumens(lm): 2042.68

Lumens(lm)/Power(W): 77.85

Central intensity(cd): 567.080

Maximum intensity(cd): 567.080

Angle of maximum intensity: C=0.0  $\gamma$ =0.0

Beam Angle(50%Imax): [C0/180]Left=56.2 Right=57.5

[C90/270]Left=69.8 Right=64.2

Field angle(10%Imax): [C0/180]Left=79.6 Right=82.4

[C90/270]Left=98.5 Right=101.8

Maximum s/h: C0\_180=1.28 C90\_270=1.28

Up flux rate of LUM(%): 6.66%

Down flux rate of LUM(%): 93.34%

CIE Type : Direct lighting

Output flux ratio in  $\pi$  solid angle : 65.128%

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Equipment:

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

C Testing Range: 0~360

Step: 30

Date: 2013-12-5

Humidity(%): 65.0%

$\gamma$  Testing Range: 0~180

Operator: king

Distance(m): 12.20

Step: 10

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
0.0	567.080	.000	.000	.000%	.000%
10.0	557.344	53.666	53.666	2.627%	2.627%
20.0	529.002	153.972	207.638	7.538%	10.165%
30.0	485.181	234.715	442.353	11.491%	21.656%
40.0	429.155	287.193	729.545	14.060%	35.715%
50.0	363.691	307.008	1036.553	15.030%	50.745%
60.0	291.292	293.813	1330.366	14.384%	65.128%
70.0	216.773	252.157	1582.523	12.344%	77.473%
80.0	147.252	192.554	1775.076	9.427%	86.899%
90.0	94.017	131.620	1906.697	6.444%	93.343%
100.0	30.847	68.117	1974.814	3.335%	96.678%
110.0	16.050	24.806	1999.620	1.214%	97.892%
120.0	12.453	14.146	2013.767	.693%	98.585%
130.0	11.647	10.811	2024.577	.529%	99.114%
140.0	9.811	8.309	2032.886	.407%	99.521%
150.0	6.797	5.217	2038.103	.255%	99.776%
160.0	5.209	2.779	2040.881	.136%	99.912%
170.0	4.502	1.376	2042.258	.067%	99.979%
180.0	4.316	.421	2042.679	.021%	100.000%

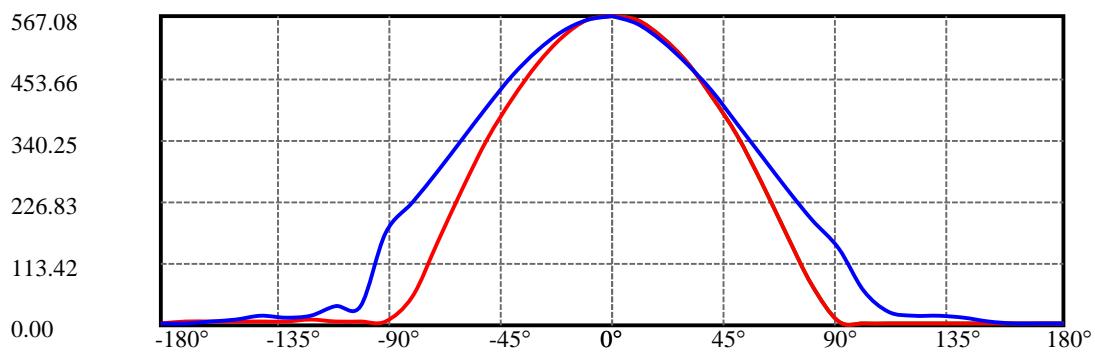
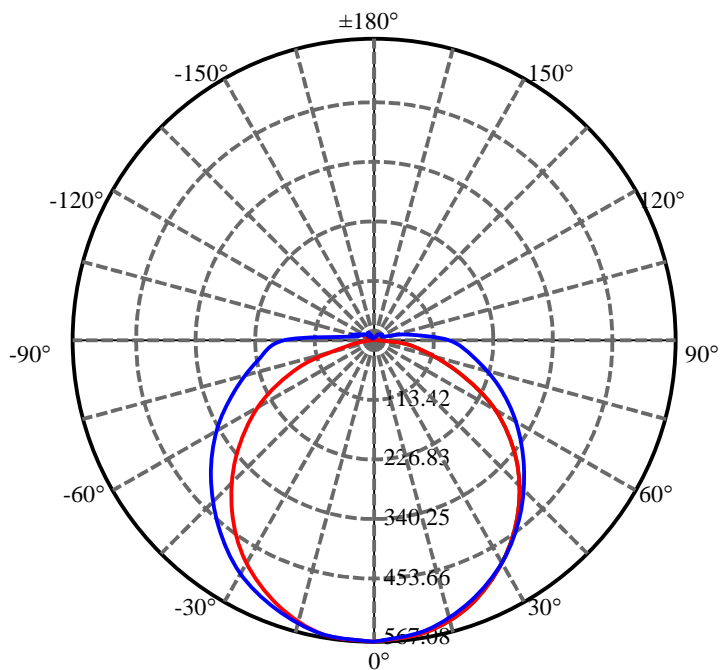


**ZONAL LUMEN SUMMARY**

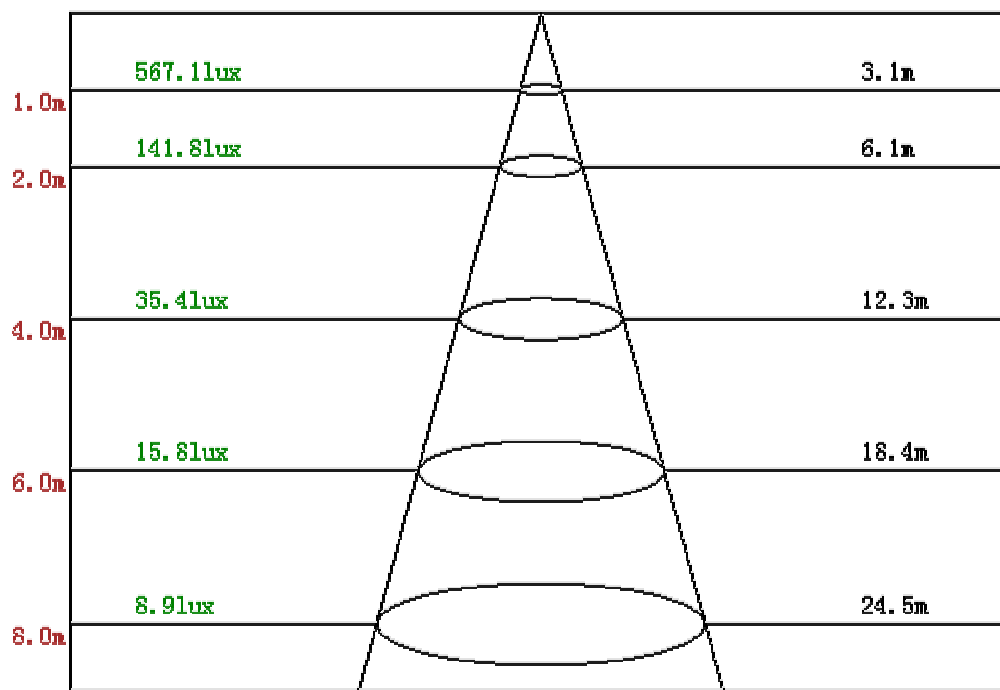
Zone	Lumens	%Fixt
0-30	442.35	21.66%
0-40	729.55	35.72%
0-60	1330.37	65.13%
0-90	1906.70	93.34%
0-120	2013.77	98.58%
0-180	2042.68	100.00%
60-90	870.14	42.60%
90-120	238.69	11.69%
90-130	249.50	12.21%
90-150	263.03	12.88%
90-180	267.18	13.08%
0-72.68	1634.14	80.00%

**ZONAL LUMEN SUMMARY**

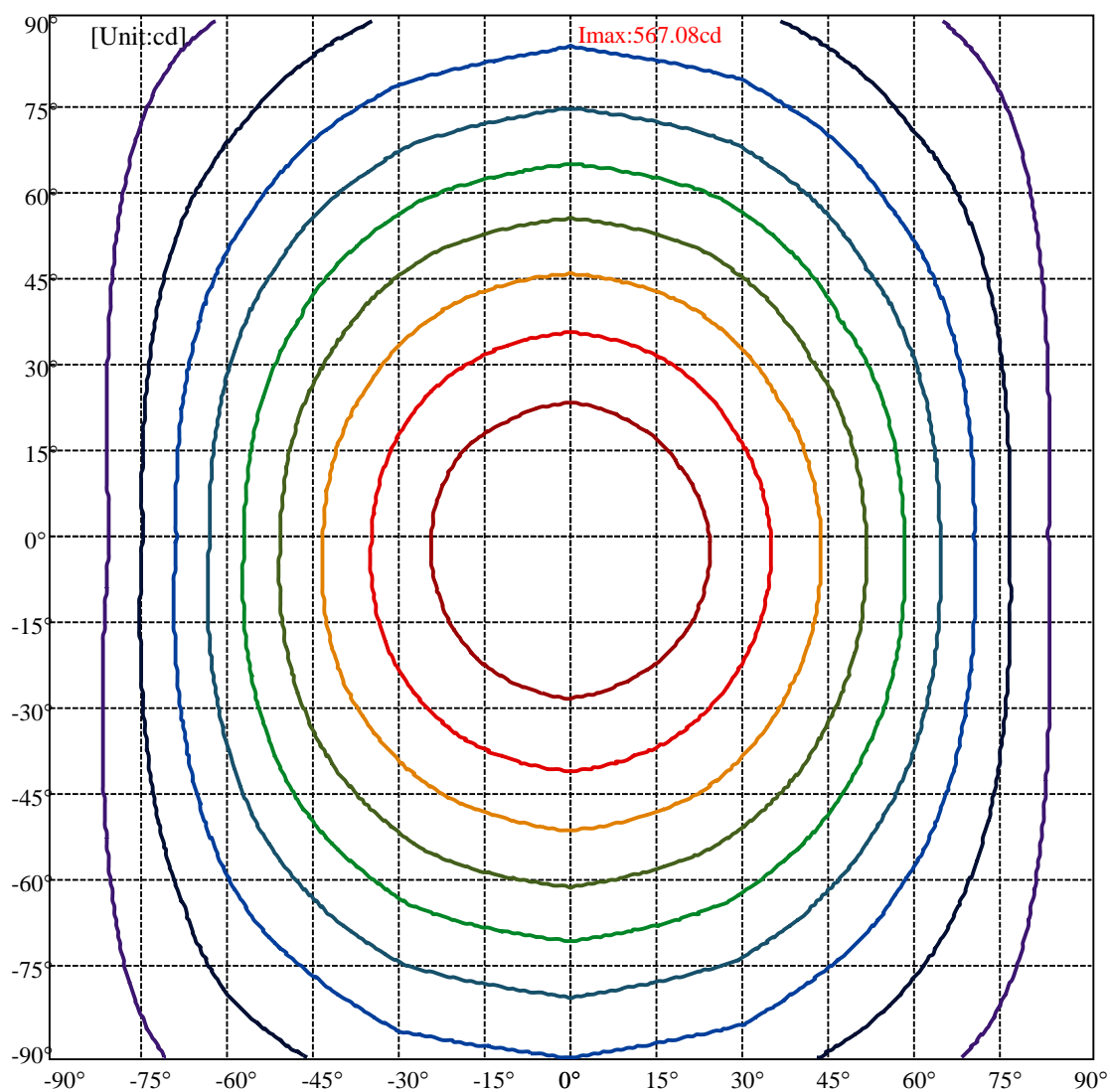
0-10	53.67
10-20	153.97
20-30	234.71
30-40	287.19
40-50	307.01
50-60	293.81
60-70	252.16
70-80	192.55
80-90	131.62
90-100	68.12
100-110	24.81
110-120	14.15
120-130	10.81
130-140	8.31
140-150	5.22
150-160	2.78
160-170	1.38
170-180	0.00



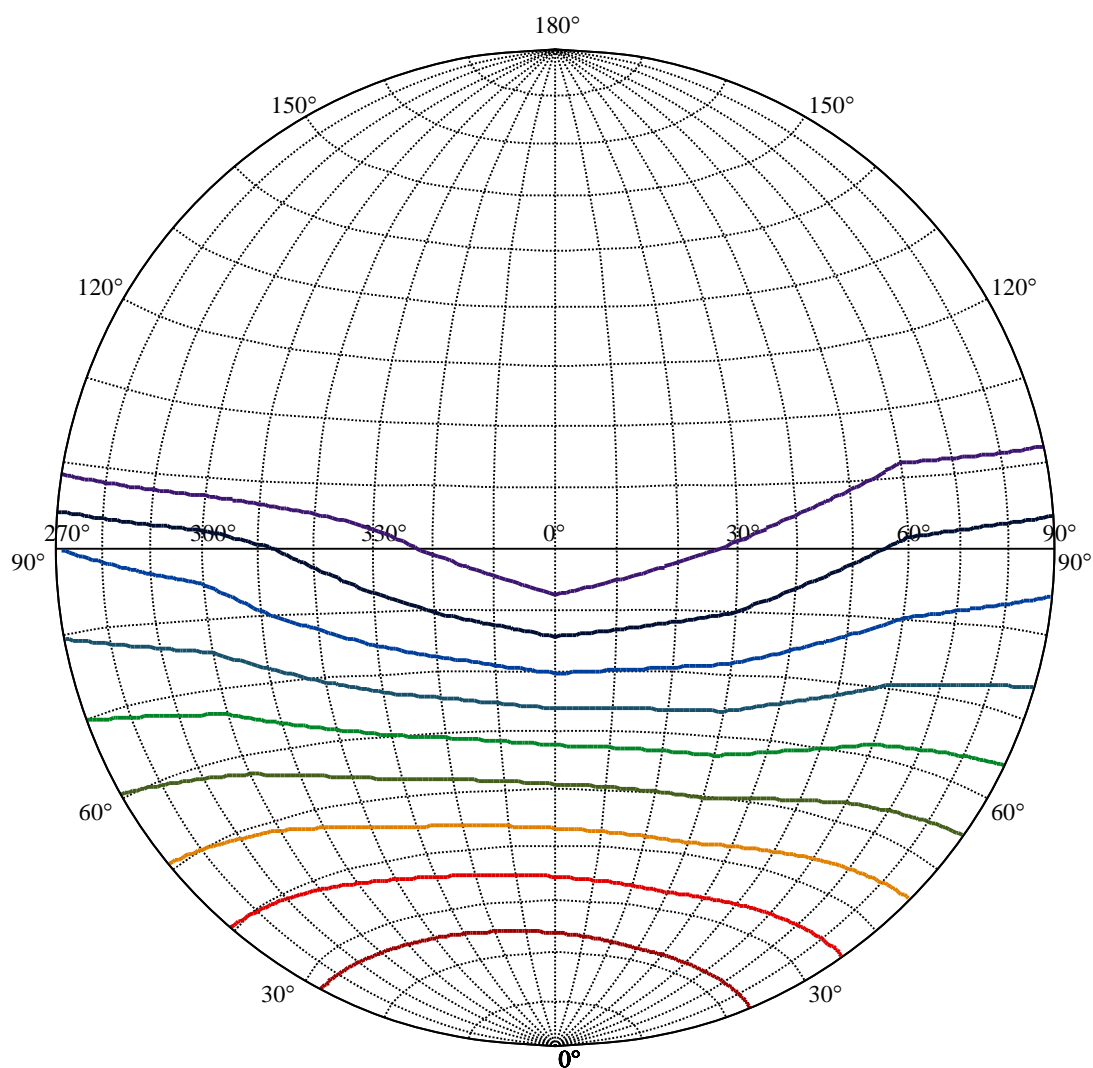
C0(Max): —  
 C0/C180: —  
 C90/C270: —



Beam angle of C0plane113.77



(10%Imax) 56.708	—
(20%Imax) 113.416	—
(30%Imax) 170.124	—
(40%Imax) 226.832	—
(50%Imax) 283.54	—
(60%Imax) 340.248	—
(70%Imax) 396.956	—
(80%Imax) 453.664	—
(90%Imax) 510.372	—



House

[Unit:cd]

Road

Imax:567.08

(10%Imax) 56.708

(20%Imax) 113.416

(30%Imax) 170.124

(40%Imax) 226.832

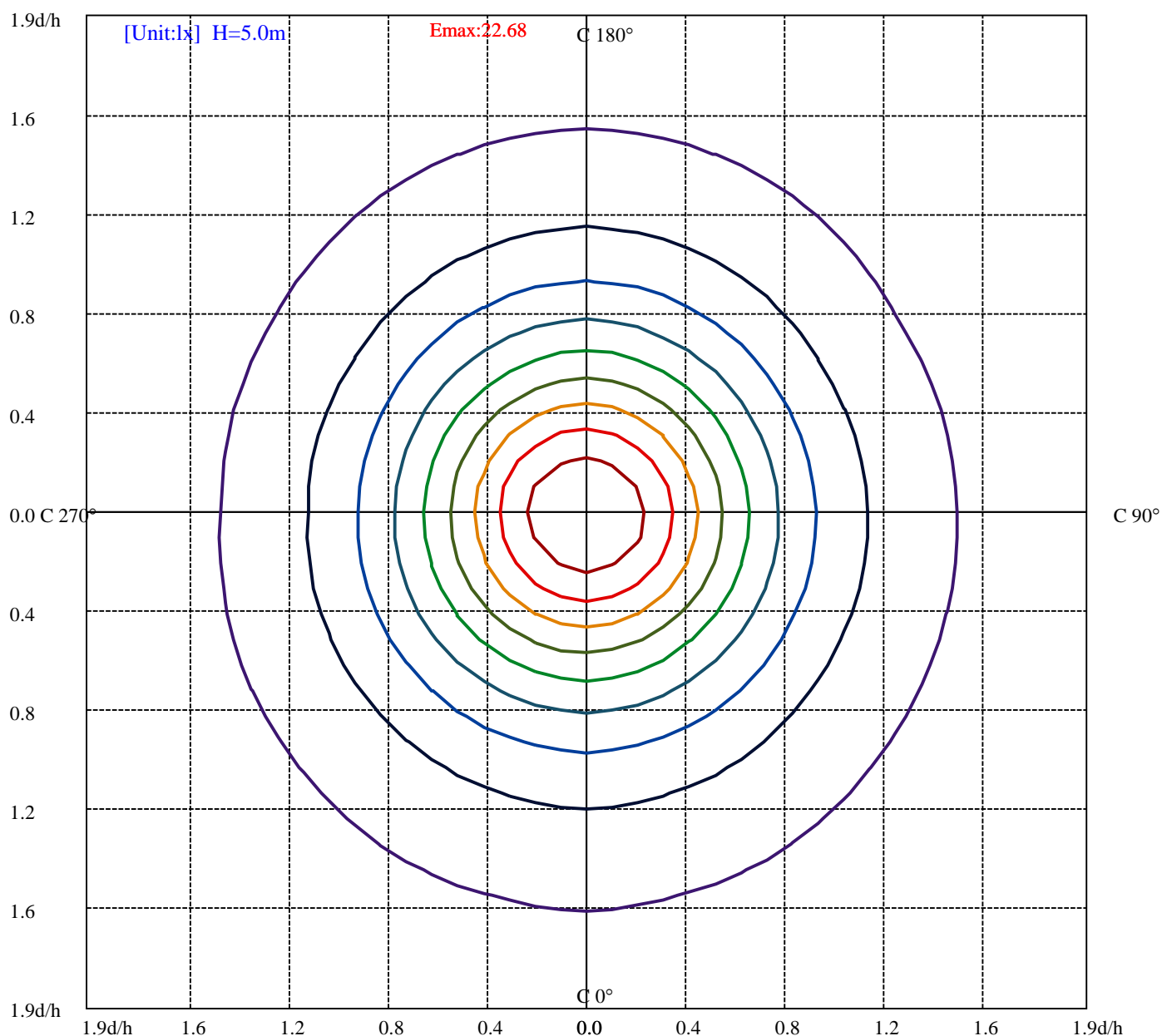
(50%Imax) 283.54

(60%Imax) 340.248

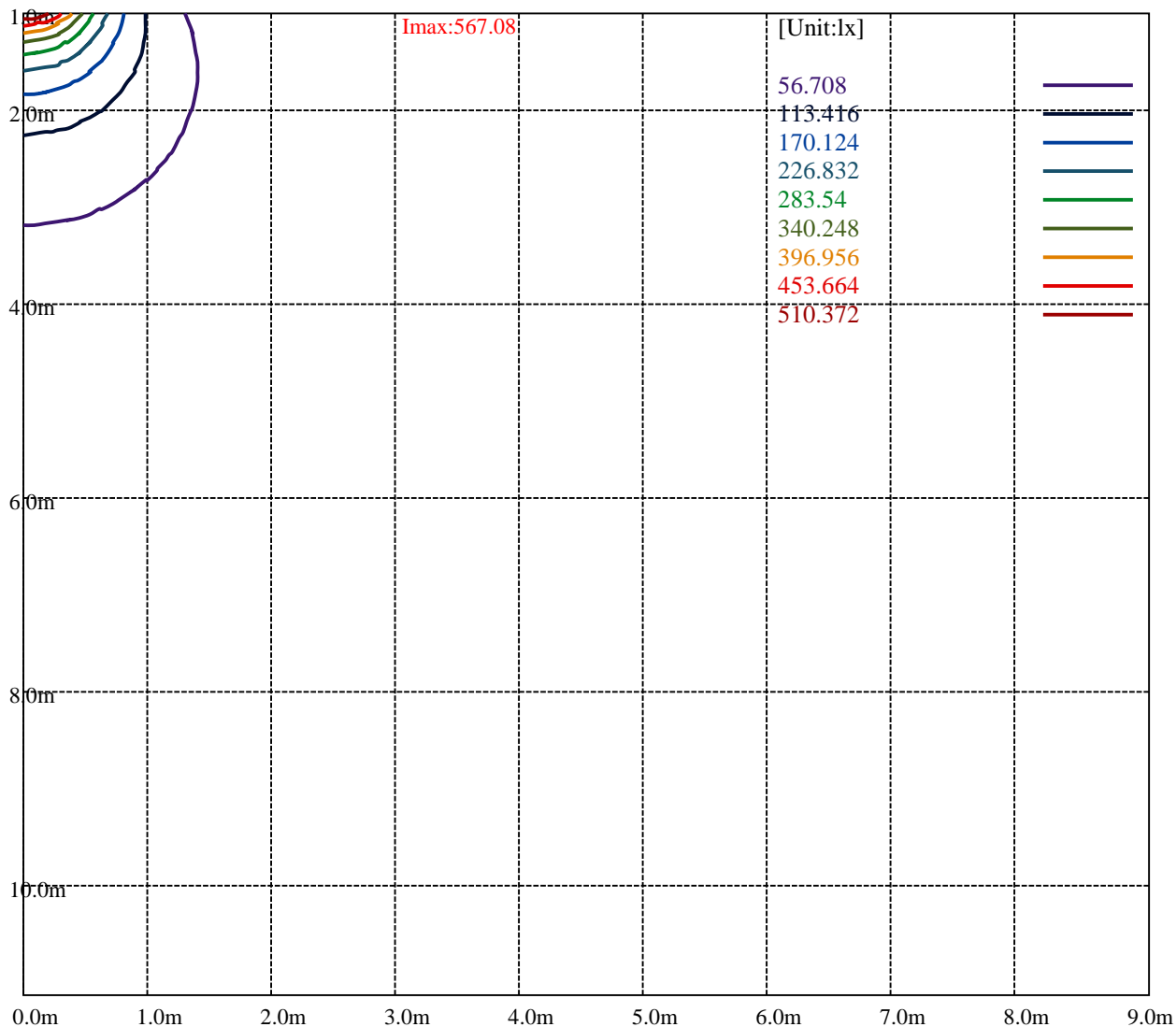
(70%Imax) 396.956

(80%Imax) 453.664

(90%Imax) 510.372



(10%Emax) 2.26832	—
(20%Emax) 4.53664	—
(30%Emax) 6.80496	—
(40%Emax) 9.07328	—
(50%Emax) 11.3416	—
(60%Emax) 13.60992	—
(70%Emax) 15.87824	—
(80%Emax) 18.14656	—
(90%Emax) 20.41488	—



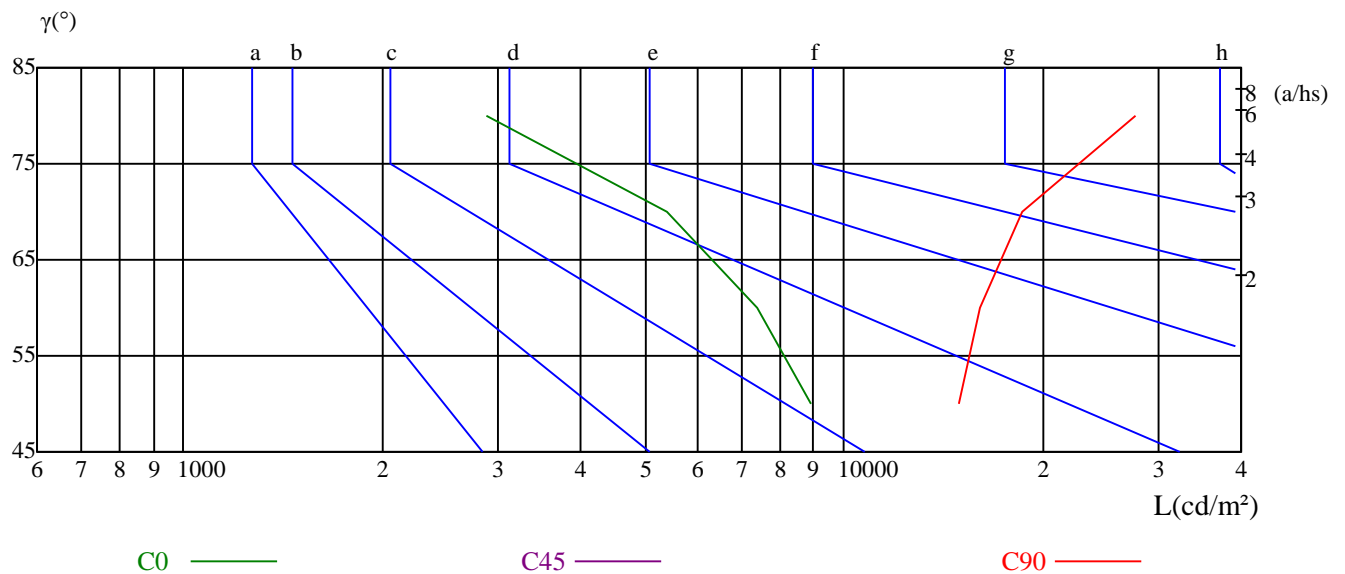
Luminance Table

$\gamma$	45	50	55	60	65	70	75	80	85
C0	0	8944	0	7409	0	5390	0	2867	0
C45	0	0	0	0	0	0	0	0	0
C90	0	14975	0	16048	0	18677	0	27749	0

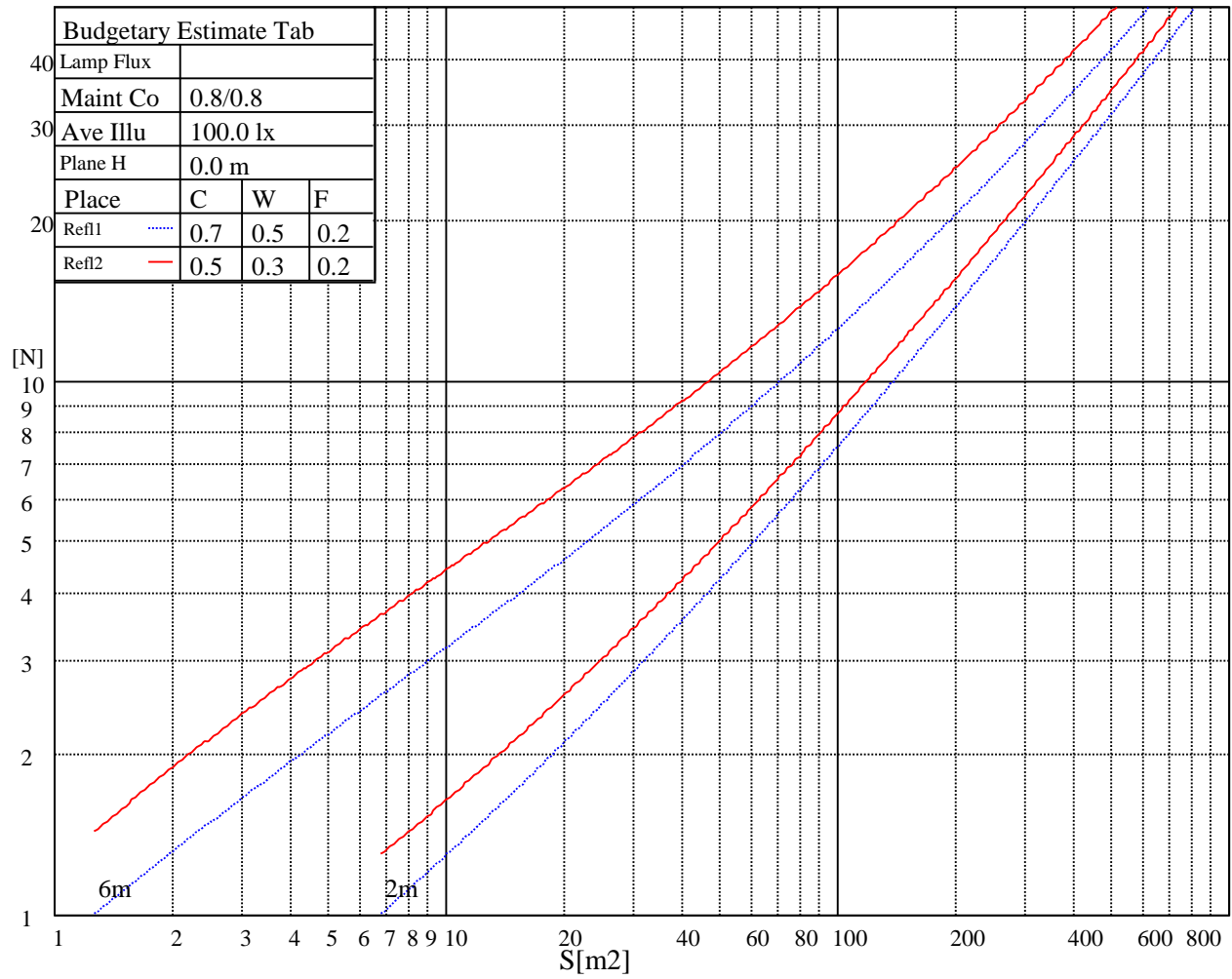
Glare Table

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

Luminance Limiting Curve



Illuminatin assessment according UGR											
Rf of Ceiling	70	70	50	50	30	70	70	50	50	30	
Rf of Wall	50	30	50	30	30	50	30	50	30	30	
Rf of Floor	20	20	20	20	20	20	20	20	20	20	
Room dimensions	Viewed crosswise					Viewed endwise					
X	Y										
2H	2H	16.7	18.1	17.1	18.4	18.8	18.0	19.3	18.3	19.7	20.1
	3H	18.1	19.4	18.6	19.8	20.2	20.3	21.6	20.8	22.0	22.4
	4H	18.5	19.6	19.0	20.0	20.5	21.4	22.5	21.9	22.9	23.4
	6H	19.0	20.0	19.4	20.5	21.0	22.9	23.9	23.3	24.4	24.9
	8H	19.1	20.2	19.6	20.6	21.1	23.7	24.7	24.1	25.2	25.7
	12H	19.0	19.8	19.5	20.3	20.9	24.3	25.2	24.9	25.7	26.2
4H	2H	17.3	18.4	17.8	18.8	19.3	18.3	19.4	18.8	19.8	20.3
	3H	19.0	19.8	19.5	20.3	20.9	20.9	21.7	21.4	22.2	22.8
	4H	19.7	20.6	20.3	21.1	21.6	22.4	23.2	22.9	23.7	24.3
	6H	20.3	21.1	20.8	21.7	22.2	24.0	24.9	24.6	25.4	25.9
	8H	20.3	20.8	20.9	21.4	22.1	24.7	25.2	25.3	25.8	26.5
	12H	20.5	21.0	21.1	21.6	22.2	25.8	26.3	26.4	26.8	27.5
8H	4H	20.3	20.8	20.9	21.4	22.0	22.6	23.1	23.2	23.7	24.3
	6H	21.1	21.6	21.7	22.2	22.8	24.4	24.9	25.0	25.5	26.2
	8H	21.4	21.9	22.0	22.5	23.1	25.5	26.0	26.1	26.6	27.2
	12H	21.6	22.1	22.2	22.7	23.4	26.7	27.2	27.3	27.8	28.4
12H	4H	20.5	21.0	21.1	21.6	22.3	22.6	23.1	23.2	23.7	24.4
	6H	21.4	21.9	22.0	22.5	23.1	24.5	25.0	25.1	25.6	26.3
	8H	21.8	22.3	22.4	22.9	23.5	25.6	26.1	26.2	26.7	27.4
Variation with the observer position at spacings:											
S = 1.0H		0.2/-0.6					0.2/-1.1				
S = 1.5H		0.5/-0.6					0.4/-1.0				
S = 2.0H		0.6/-0.8					0.2/-0.7				
Standard tables:		BKBF					BKBF				
Uncorrected UGR		5.9					9.2				
According 1000lm											



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	1.17	1.17	1.17	1.14	1.14	1.14	1.07	1.07	1.07	1.01	1.01	1.01	0.96	0.96	0.96	0.93
1	0.99	0.94	0.89	0.96	0.91	0.87	0.90	0.87	0.83	0.85	0.82	0.79	0.81	0.78	0.76	0.73
2	0.85	0.77	0.71	0.83	0.75	0.69	0.78	0.72	0.67	0.73	0.69	0.64	0.69	0.65	0.62	0.59
3	0.74	0.65	0.58	0.72	0.64	0.57	0.68	0.61	0.55	0.64	0.58	0.53	0.61	0.56	0.52	0.49
4	0.65	0.56	0.49	0.63	0.55	0.48	0.60	0.52	0.46	0.57	0.50	0.45	0.54	0.48	0.44	0.41
5	0.58	0.48	0.41	0.56	0.48	0.41	0.54	0.46	0.40	0.51	0.44	0.39	0.48	0.42	0.38	0.35
6	0.52	0.43	0.36	0.51	0.42	0.35	0.48	0.40	0.35	0.46	0.39	0.34	0.44	0.38	0.33	0.31
7	0.47	0.38	0.32	0.46	0.37	0.31	0.44	0.36	0.30	0.42	0.35	0.30	0.40	0.34	0.29	0.27
8	0.43	0.34	0.28	0.42	0.34	0.28	0.40	0.32	0.27	0.38	0.31	0.27	0.36	0.30	0.26	0.24
9	0.39	0.31	0.25	0.38	0.30	0.25	0.37	0.29	0.24	0.35	0.29	0.24	0.34	0.28	0.23	0.21
10	0.36	0.28	0.23	0.35	0.28	0.22	0.34	0.27	0.22	0.33	0.26	0.22	0.31	0.25	0.21	0.19

Intensity data(cd)									
Page: 14 Total:14									
C/γ(°)	0.0	10.0	20.0	30.0	40.0	50.0	60.0	70.0	80.0
0.0	567.08	558.60	529.13	481.35	419.58	348.29	262.40	166.11	72.49
30.0	567.08	553.54	521.68	472.27	411.99	338.91	258.24	182.03	113.27
60.0	567.08	550.41	519.60	475.99	420.77	358.56	295.00	230.40	171.17
90.0	567.08	553.24	523.02	480.75	428.06	369.27	309.29	248.41	192.15
120.0	567.08	552.20	521.68	476.44	422.11	359.75	292.92	226.98	167.59
150.0	567.08	560.53	528.08	478.52	415.41	341.89	259.87	179.20	107.31
180.0	567.08	560.53	530.02	480.60	417.35	340.10	248.41	149.73	52.84
210.0	567.08	558.60	531.81	490.28	434.46	367.34	289.79	209.86	137.83
240.0	567.08	558.00	534.48	498.32	448.16	388.32	328.34	263.15	200.93
270.0	567.08	561.72	539.55	502.78	456.34	401.27	343.08	282.20	223.86
300.0	567.08	558.75	535.23	495.79	446.22	387.73	322.98	259.73	197.06
330.0	567.08	562.02	533.74	489.09	429.40	362.87	285.18	203.46	130.53
360.0	567.08	558.60	529.13	481.35	419.58	348.29	262.40	166.11	72.49
C/γ(°)	90.0	100.0	110.0	120.0	130.0	140.0	150.0	160.0	170.0
0.0	6.55	3.87	4.02	4.32	4.47	4.61	4.47	4.61	4.91
30.0	61.77	13.84	10.72	12.35	9.82	8.04	6.40	5.51	4.91
60.0	121.75	66.98	18.46	12.95	16.67	10.42	6.40	4.47	3.72
90.0	142.29	64.00	23.67	16.22	18.01	12.95	7.74	4.91	3.72
120.0	117.73	61.77	19.05	13.40	16.22	10.72	7.14	5.21	4.32
150.0	55.96	14.44	12.80	12.06	9.97	8.48	7.29	6.10	5.51
180.0	8.48	8.48	8.78	8.93	8.78	8.34	7.59	6.70	5.95
210.0	80.08	25.60	9.23	11.46	8.04	6.10	4.91	4.47	4.32
240.0	148.24	29.92	21.28	14.59	13.10	12.65	7.59	5.06	3.87
270.0	169.98	36.91	36.61	18.61	12.50	16.97	9.53	5.66	4.02
300.0	142.44	26.49	19.80	13.99	14.44	12.35	7.44	5.06	4.17
330.0	72.93	17.86	8.19	10.57	7.74	6.10	5.06	4.76	4.61
360.0	6.55	3.87	4.02	4.32	4.47	4.61	4.47	4.61	4.91
C/γ(°)	180.0								
0.0	4.32								
30.0	4.32								
60.0	4.32								
90.0	4.32								
120.0	4.32								
150.0	4.32								
180.0	4.32								
210.0	4.32								
240.0	4.32								
270.0	4.32								
300.0	4.32								
330.0	4.32								
360.0	4.32								