



BELL-Southcn Testing Laboratory(Shenzhen)

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SOLERGIE(QINGDAO) RENEWABLE ENERGY CO.,LTD

LumCAT: LED18W/SL192-G13(840)

Luminaire: LED Tube

Report No: BSR13120507-9

Voltage(V): 230.040

Test No: BSR13120507-9

Current(A): 0.092

LampCAT:

Power (W): 20.394

Lamp flux(lm)

PF: 0.966

Number of Lamps: 1

Ballast type:

Length(mm): 1160

Width(mm): 26

Phm Type: C

Height(mm): 13

Photometric Results

Lumens(lm): 1599.60

Lumens(lm)/Power(W): 78.43

Central intensity(cd): 449.596

Maximum intensity(cd): 452.325

Angle of maximum intensity: C=150.0 γ =0.0

Beam Angle(50%Imax): [C0/180]Left=55.5 Right=57.7

[C90/270]Left=63.6 Right=69.8

Field angle(10%Imax): [C0/180]Left=79.3 Right=82.7

[C90/270]Left=96.7 Right=103.4

Maximum s/h: C0_180=1.26 C90_270=1.34

Up flux rate of LUM(%): 5.97%

Down flux rate of LUM(%): 94.03%

CIE Type : Direct lighting

Output flux ratio in π solid angle : 65.758%

Equipment:

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

C Testing Range: 0~360

Step: 30

Date: 2013-12-5

Humidity(%): 65.0%

γ Testing Range: 0~180

Operator: king

Distance(m): 12.20

Step: 10

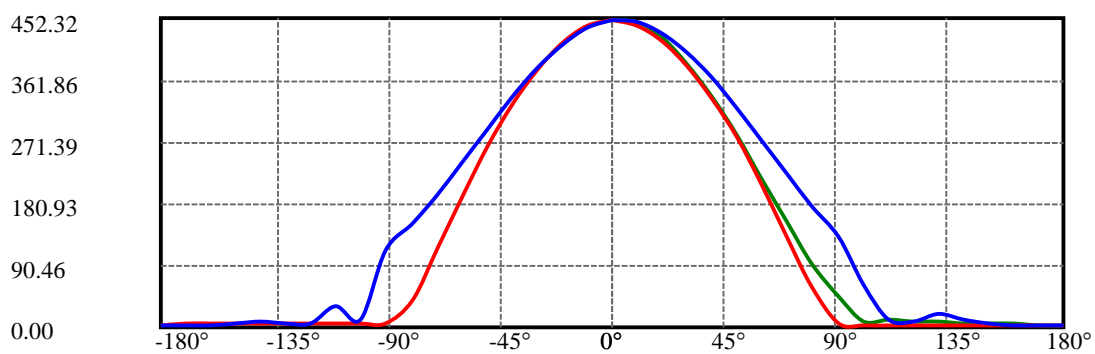
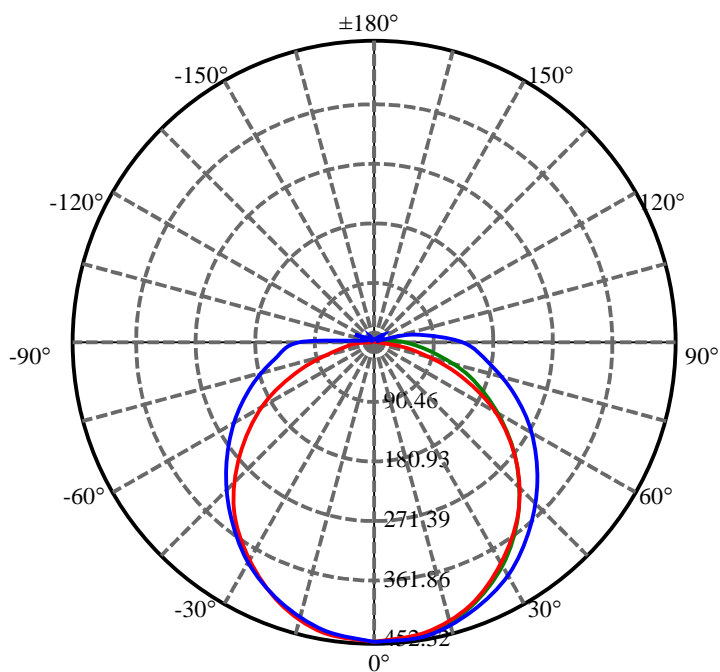
$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
0.0	449.596	.000	.000	.000%	.000%
10.0	441.794	42.544	42.544	2.660%	2.660%
20.0	419.084	122.015	164.559	7.628%	10.288%
30.0	384.057	185.873	350.432	11.620%	21.908%
40.0	339.281	227.200	577.632	14.204%	36.111%
50.0	287.245	242.605	820.237	15.167%	51.278%
60.0	229.122	231.632	1051.869	14.481%	65.758%
70.0	170.455	198.313	1250.183	12.398%	78.156%
80.0	115.452	151.232	1401.415	9.454%	87.611%
90.0	72.715	102.651	1504.065	6.417%	94.028%
100.0	22.129	51.740	1555.805	3.235%	97.262%
110.0	8.914	16.420	1572.226	1.027%	98.289%
120.0	6.669	7.734	1579.960	.484%	98.772%
130.0	8.166	6.655	1586.615	.416%	99.189%
140.0	6.956	5.856	1592.471	.366%	99.555%
150.0	4.941	3.737	1596.208	.234%	99.788%
160.0	3.854	2.035	1598.243	.127%	99.915%
170.0	3.415	1.030	1599.273	.064%	99.980%
180.0	3.346	.323	1599.596	.020%	100.000%

ZONAL LUMEN SUMMARY

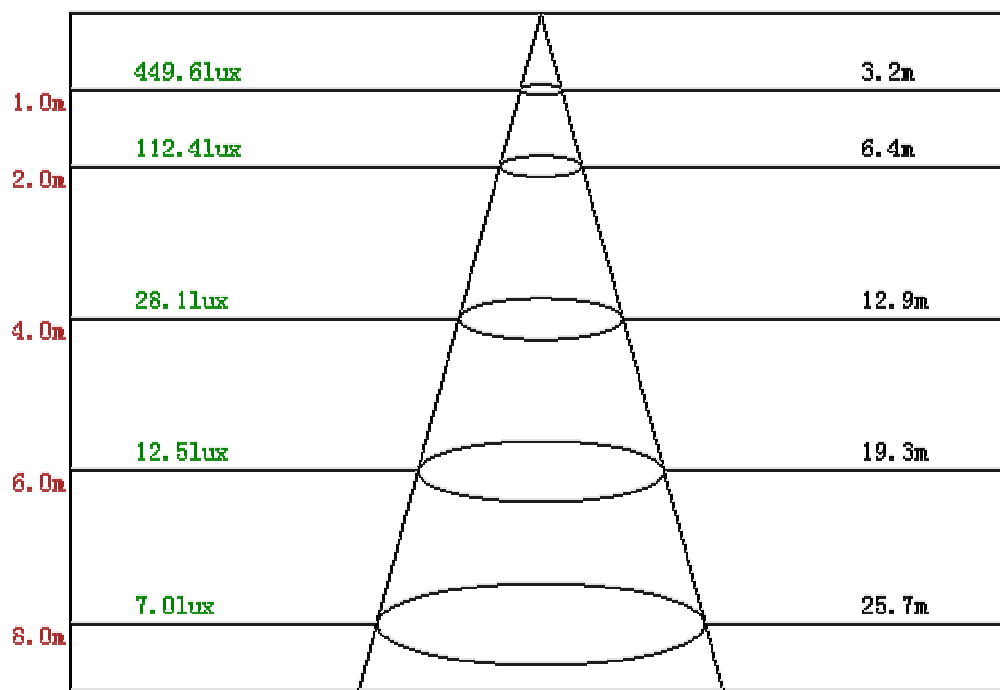
Zone	Lumens	%Fixt
0-30	350.43	21.91%
0-40	577.63	36.11%
0-60	1051.87	65.76%
0-90	1504.07	94.03%
0-120	1579.96	98.77%
0-180	1599.60	100.00%
60-90	683.83	42.75%
90-120	178.55	11.16%
90-130	185.20	11.58%
90-150	194.79	12.18%
90-180	197.86	12.37%
0-71.95	1279.68	80.00%

ZONAL LUMEN SUMMARY

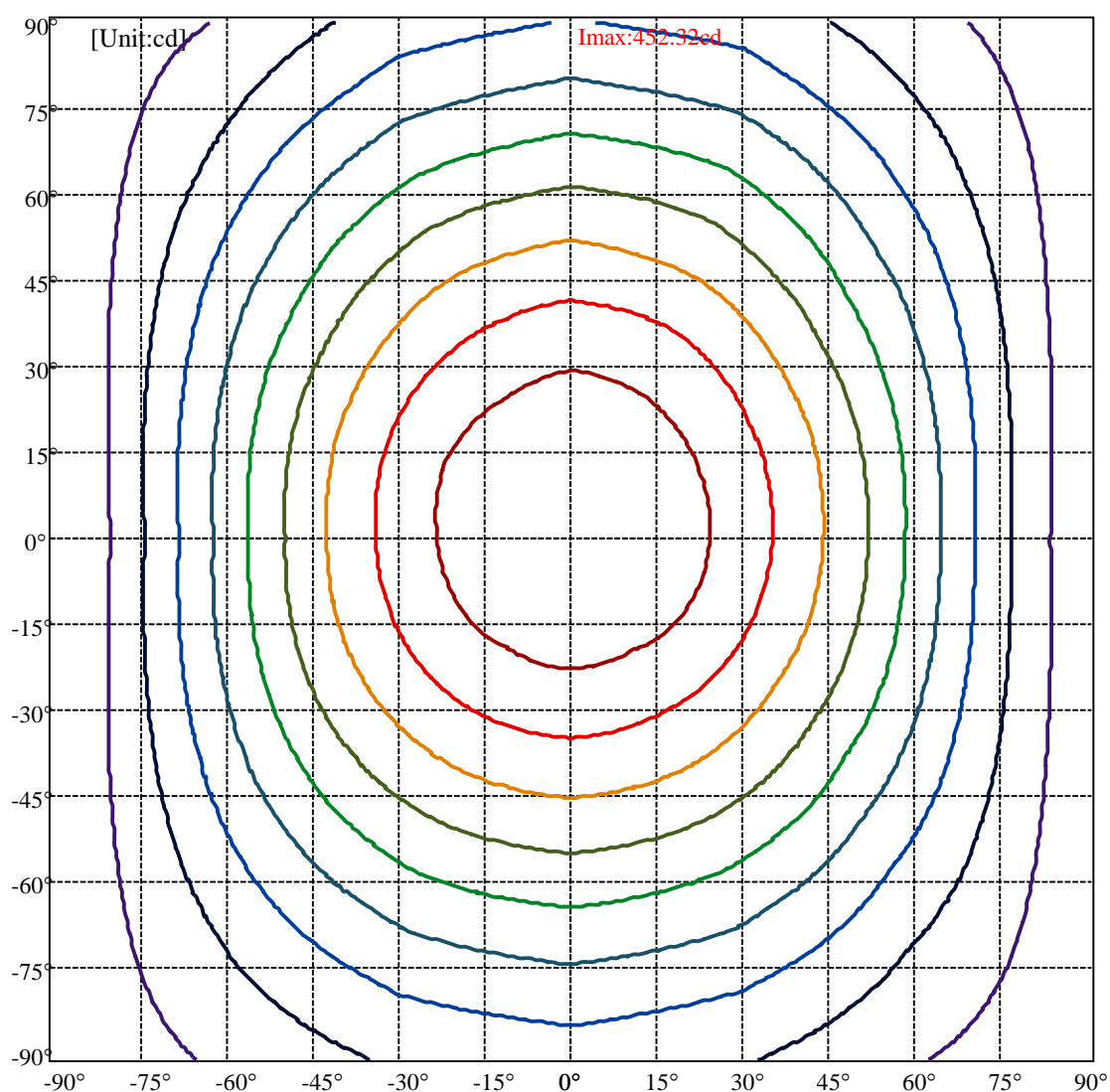
0-10	42.54
10-20	122.02
20-30	185.87
30-40	227.20
40-50	242.61
50-60	231.63
60-70	198.31
70-80	151.23
80-90	102.65
90-100	51.74
100-110	16.42
110-120	7.73
120-130	6.65
130-140	5.86
140-150	3.74
150-160	2.04
160-170	1.03
170-180	0.00



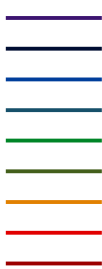
C150(Max): —
 C0/C180: —
 C90/C270: —

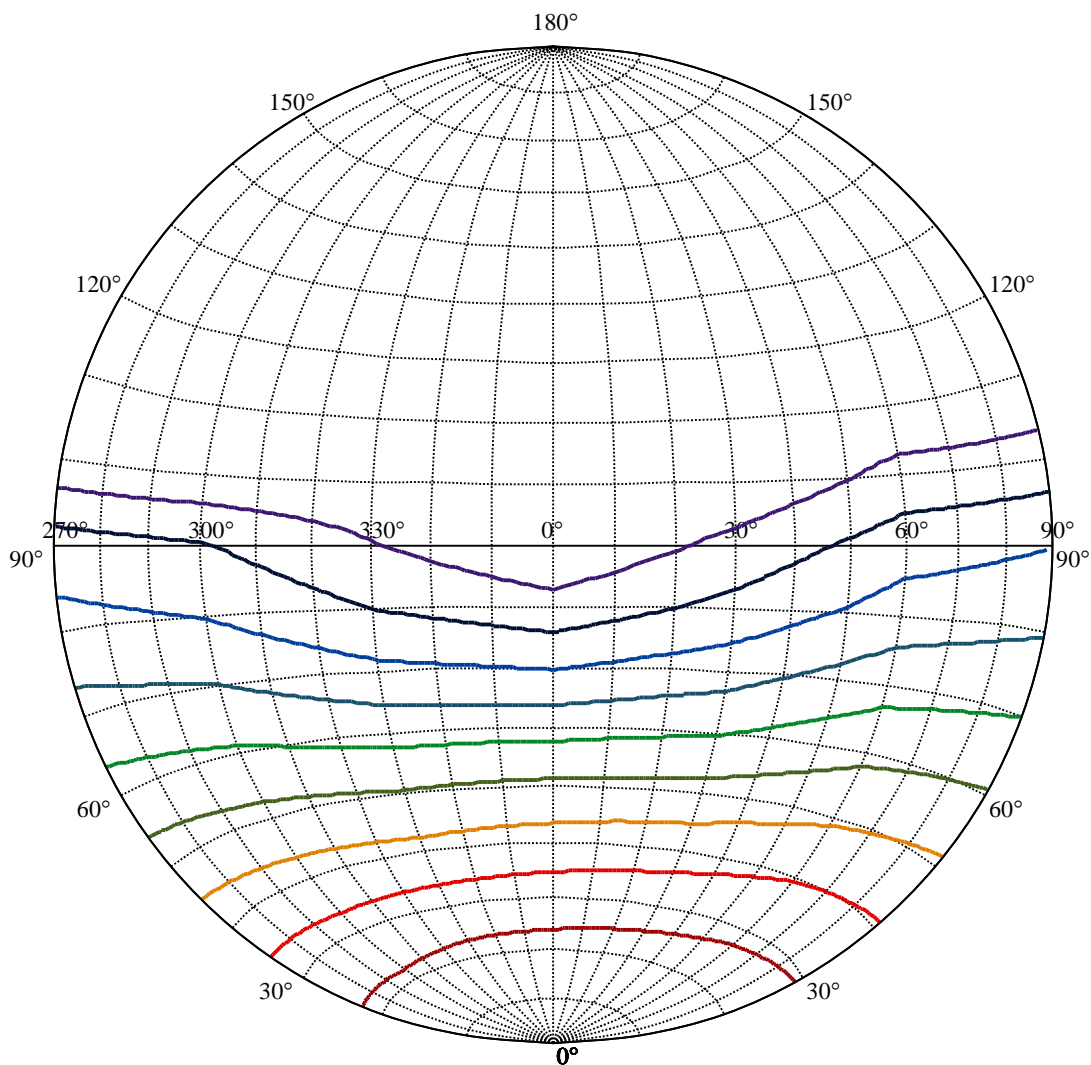


Beam angle of C150plane116.27



(10%Imax) 44.9596
 (20%Imax) 89.9192
 (30%Imax) 134.879
 (40%Imax) 179.838
 (50%Imax) 224.798
 (60%Imax) 269.758
 (70%Imax) 314.717
 (80%Imax) 359.677
 (90%Imax) 404.636





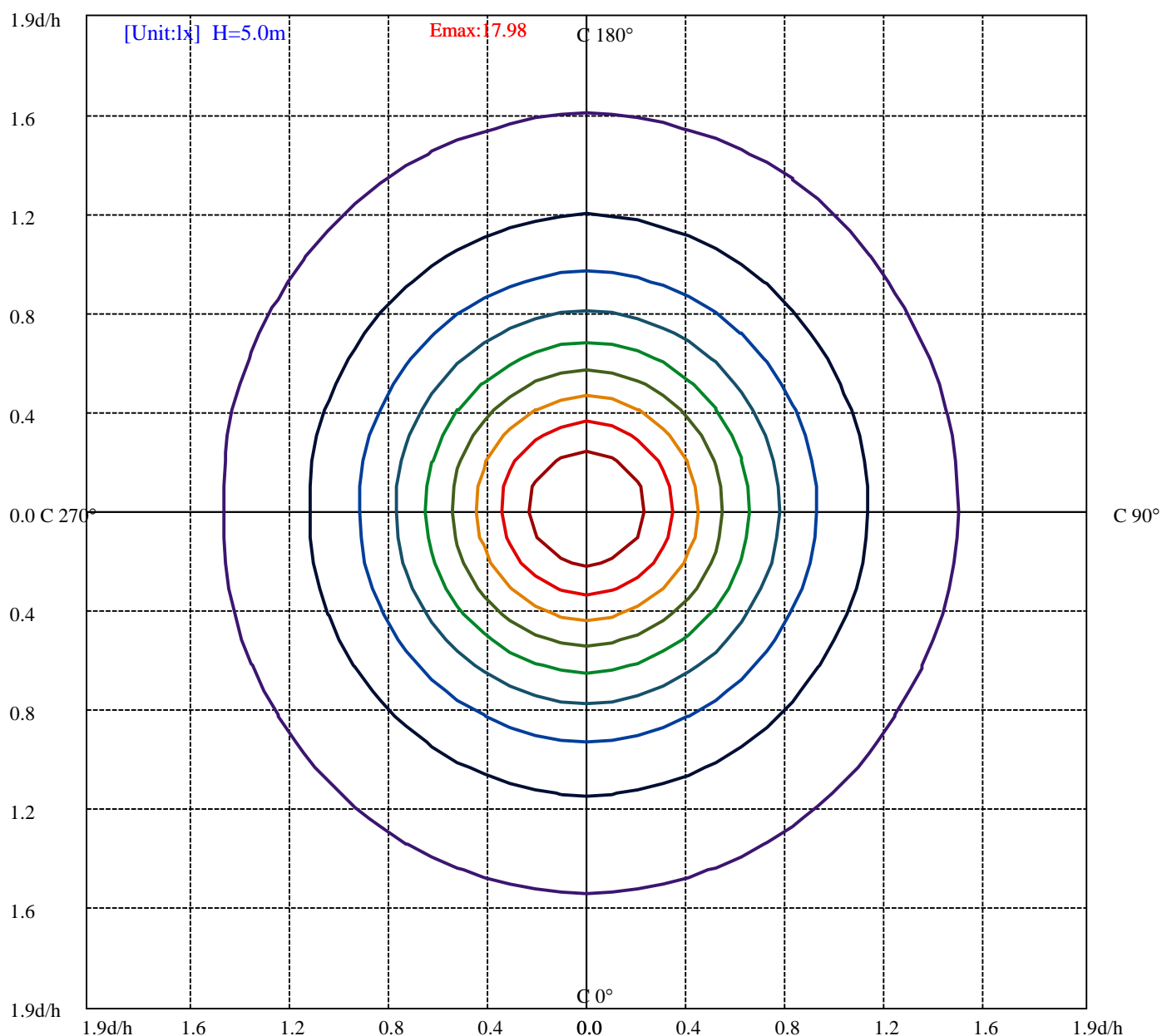
House

[Unit:cd]

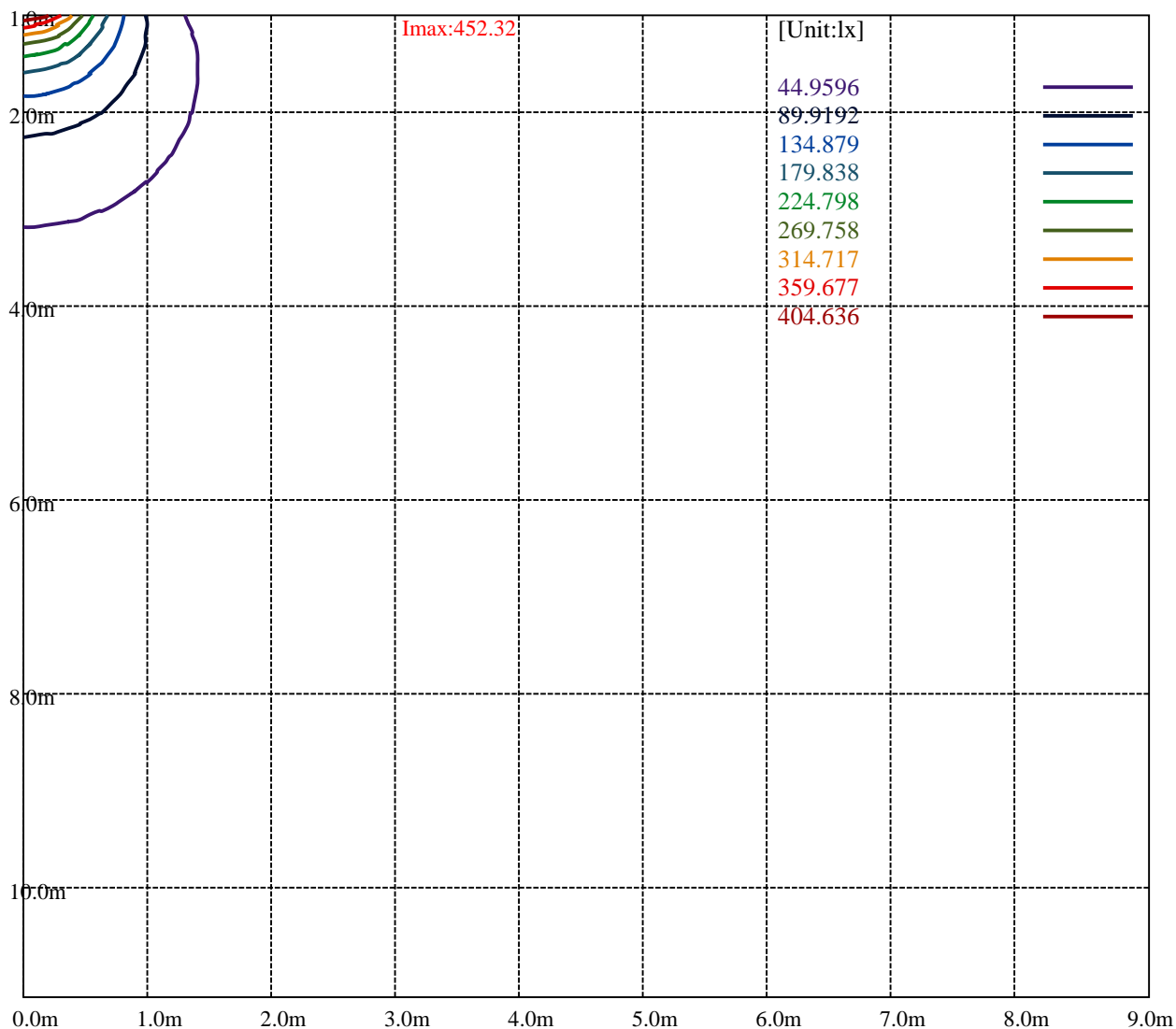
Road

I_{max}:452.32
 (10% I_{max}) 44.9596
 (20% I_{max}) 89.9192
 (30% I_{max}) 134.879
 (40% I_{max}) 179.838
 (50% I_{max}) 224.798
 (60% I_{max}) 269.758
 (70% I_{max}) 314.717
 (80% I_{max}) 359.677
 (90% I_{max}) 404.636





(10%Emax) 1.798384	—
(20%Emax) 3.596768	—
(30%Emax) 5.39516	—
(40%Emax) 7.19352	—
(50%Emax) 8.99192	—
(60%Emax) 10.79032	—
(70%Emax) 12.58868	—
(80%Emax) 14.38708	—
(90%Emax) 16.18544	—

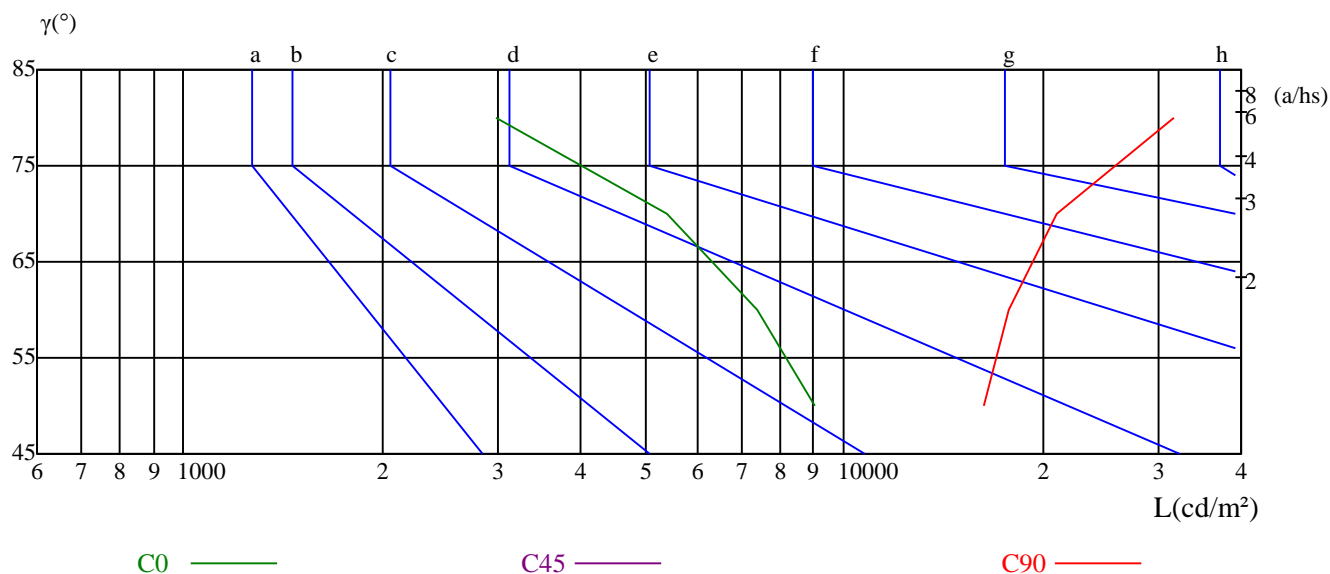


Luminance Table

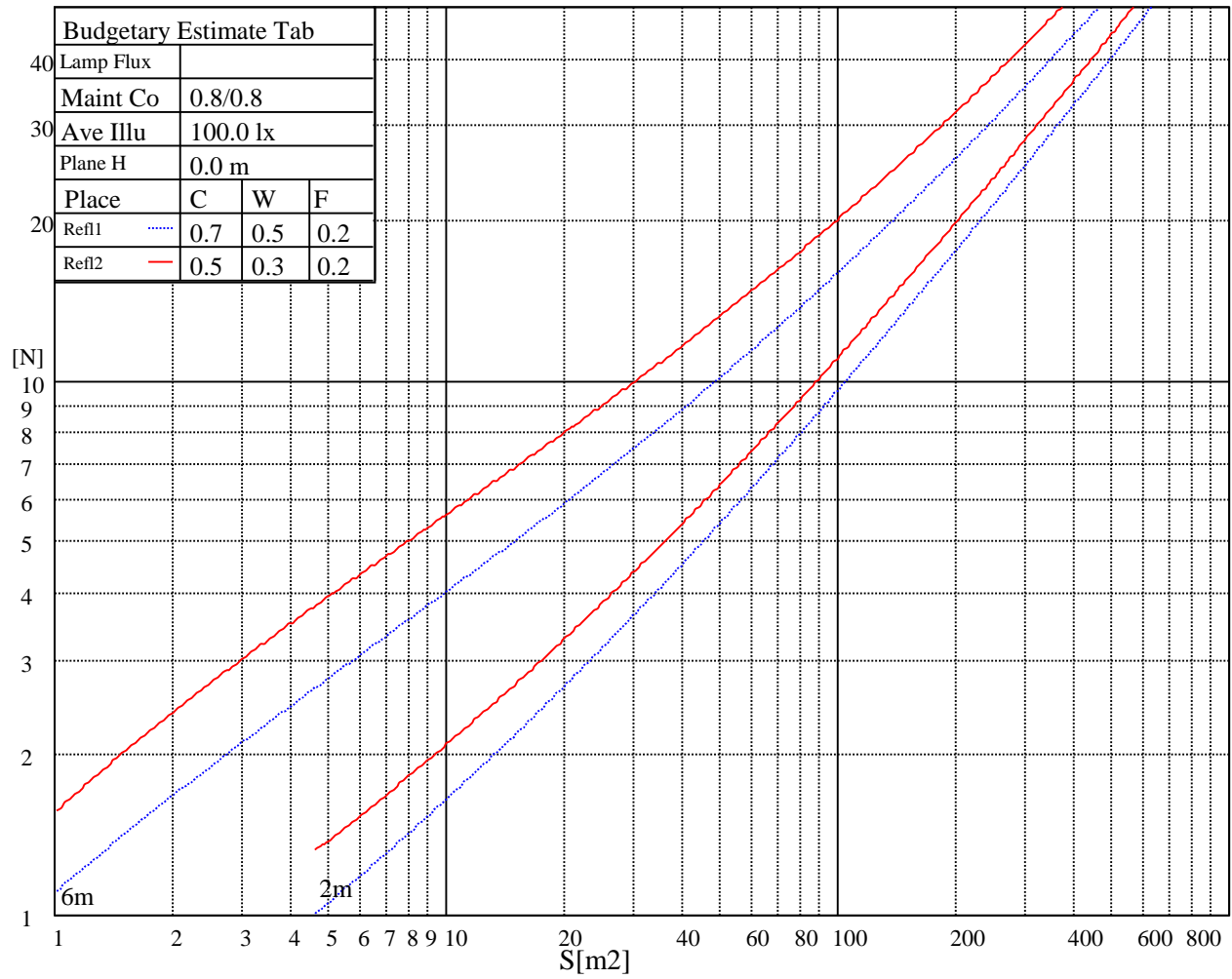
γ	45	50	55	60	65	70	75	80	85
C0	0	9020	0	7416	0	5401	0	2983	0
C45	0	0	0	0	0	0	0	0	0
C90	0	16342	0	17757	0	21053	0	31718	0

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


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	17.9	19.3	18.3	19.6	20.0	19.5	20.9	19.9	21.3	21.6
	3H	19.3	20.6	19.8	21.0	21.4	22.0	23.3	22.4	23.6	24.1
	4H	19.7	20.8	20.2	21.3	21.7	23.1	24.2	23.6	24.7	25.1
	6H	20.2	21.3	20.7	21.7	22.2	24.6	25.7	25.1	26.2	26.6
	8H	20.4	21.4	20.8	21.9	22.3	25.5	26.6	25.9	27.0	27.5
4H	12H	20.2	21.1	20.8	21.6	22.1	26.2	27.0	26.7	27.5	28.1
	2H	18.7	19.7	19.1	20.2	20.6	19.9	21.0	20.4	21.4	21.9
	3H	20.3	21.2	20.8	21.6	22.2	22.6	23.4	23.1	23.9	24.5
	4H	21.1	21.9	21.6	22.4	23.0	24.2	25.0	24.7	25.5	26.0
	6H	21.7	22.5	22.2	23.0	23.6	25.8	26.7	26.4	27.2	27.7
8H	8H	21.7	22.2	22.3	22.8	23.4	26.6	27.1	27.2	27.7	28.3
	12H	21.9	22.4	22.5	22.9	23.6	27.6	28.1	28.2	28.7	29.3
	4H	21.8	22.3	22.3	22.8	23.5	24.4	24.9	24.9	25.4	26.1
	6H	22.6	23.1	23.2	23.6	24.3	26.2	26.7	26.8	27.3	28.0
	8H	22.9	23.4	23.5	24.0	24.6	27.3	27.8	27.9	28.4	29.0
12H	12H	23.1	23.6	23.7	24.2	24.9	28.5	29.1	29.1	29.6	30.3
	4H	22.0	22.5	22.6	23.1	23.7	24.4	24.9	25.0	25.5	26.1
	6H	22.9	23.4	23.5	24.0	24.6	26.3	26.8	26.9	27.4	28.1
	8H	23.4	23.9	23.9	24.4	25.1	27.5	28.0	28.1	28.6	29.2
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		7.3					10.9				
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	1.18	1.18	1.18	1.14	1.14	1.14	1.08	1.08	1.08	1.02	1.02	1.02	0.97	0.97	0.97	0.94
1	0.99	0.94	0.89	0.96	0.92	0.87	0.91	0.87	0.83	0.86	0.83	0.80	0.81	0.79	0.76	0.74
2	0.85	0.78	0.71	0.83	0.76	0.70	0.78	0.72	0.67	0.74	0.69	0.65	0.70	0.66	0.62	0.60
3	0.74	0.65	0.58	0.72	0.64	0.57	0.68	0.61	0.55	0.65	0.59	0.54	0.61	0.56	0.52	0.49
4	0.65	0.56	0.49	0.64	0.55	0.48	0.60	0.53	0.47	0.57	0.51	0.45	0.54	0.49	0.44	0.42
5	0.58	0.49	0.42	0.57	0.48	0.41	0.54	0.46	0.40	0.51	0.44	0.39	0.49	0.43	0.38	0.36
6	0.52	0.43	0.36	0.51	0.42	0.36	0.48	0.41	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	0.31	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	0.33	0.27	0.38	0.32	0.27	0.37	0.31	0.26	0.24
9	0.39	0.31	0.25	0.39	0.30	0.25	0.37	0.30	0.25	0.35	0.29	0.24	0.34	0.28	0.24	0.22
10	0.36	0.28	0.23	0.36	0.28	0.23	0.34	0.27	0.22	0.33	0.26	0.22	0.31	0.26	0.21	0.20

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	449.60	441.31	419.28	382.52	334.74	279.06	208.69	132.26	59.92		
30.0	449.60	445.33	423.30	387.13	342.33	285.77	222.22	160.60	103.44		
60.0	449.60	443.84	425.38	397.11	357.07	308.55	260.17	208.38	157.03		
90.0	449.60	447.26	429.40	401.87	363.91	321.05	272.97	223.86	176.67		
120.0	449.60	443.69	424.79	392.79	352.16	306.16	253.92	201.38	152.11		
150.0	449.60	446.07	423.60	386.09	338.16	280.12	216.12	153.60	93.62		
180.0	449.60	441.16	416.16	377.16	327.15	264.64	192.00	115.65	39.84		
210.0	449.60	439.97	413.63	375.23	327.89	272.65	209.43	147.01	93.20		
240.0	449.60	436.25	410.80	375.82	331.62	282.48	232.19	181.70	135.71		
270.0	449.60	438.63	413.48	378.20	336.53	290.22	241.70	195.17	150.85		
300.0	449.60	436.55	412.14	375.08	331.91	282.93	230.60	180.74	133.33		
330.0	449.60	441.46	417.05	379.69	327.89	273.31	209.45	145.12	89.68		
360.0	449.60	441.31	419.28	382.52	334.74	279.06	208.69	132.26	59.92		
C/γ(°)	90.0	100.0	110.0	120.0	130.0	140.0	150.0	160.0	170.0		
0.0	5.11	2.71	2.86	3.05	3.24	3.33	3.33	3.44	3.62		
30.0	58.30	8.93	6.74	9.82	7.43	5.94	4.76	4.08	3.74		
60.0	114.76	59.63	8.22	6.56	15.21	9.21	5.75	3.72	3.01		
90.0	133.06	62.81	10.36	7.70	20.08	11.54	6.70	4.03	3.02		
120.0	108.80	50.16	8.01	7.20	14.05	8.77	5.55	3.88	3.16		
150.0	45.52	8.74	12.16	9.09	7.37	6.18	5.21	4.51	3.97		
180.0	5.73	5.77	5.94	6.07	6.09	5.86	5.34	4.82	4.33		
210.0	51.74	17.89	4.63	6.30	5.21	4.32	3.74	3.47	3.50		
240.0	96.81	11.37	7.08	5.69	4.70	7.49	4.82	3.62	3.08		
270.0	111.60	11.55	29.89	6.89	5.30	9.47	5.70	3.78	3.01		
300.0	93.58	11.45	6.94	5.46	4.49	7.29	4.81	3.53	3.07		
330.0	47.58	14.54	4.15	6.19	4.82	4.08	3.59	3.36	3.48		
360.0	5.11	2.71	2.86	3.05	3.24	3.33	3.33	3.44	3.62		
C/γ(°)	180.0										
0.0	3.35										
30.0	3.35										
60.0	3.35										
90.0	3.35										
120.0	3.35										
150.0	3.35										
180.0	3.35										
210.0	3.35										
240.0	3.35										
270.0	3.35										
300.0	3.35										
330.0	3.35										
360.0	3.35										