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NATA

LumCAT: 2-1676-M	
Luminaire: 92.70.131.00	
Report No: NATA0100	Voltage(V): 36.6000
Test No: GC2018121104	Current(A): 0.5100
LampCAT: OSRAM SOLERIQ S13	Power (W): 18.6660
Lamp flux(lm): 1804.0	PF: 0.0000
Number of Lamps: 1	Ballast type: DC
Length(mm): 70	Width(mm): 70
Phm Type: C	Height(mm): 0

Photometric Results

Lumens(lm): 1610.42
Efficiency(%): 89.27%
Lumens(lm)/Power(W): 87.41
Central intensity(cd): 3785.344
Maximum intensity(cd): 3785.344
Angle of maximum intensity: C=0.0 γ =0.0
Beam Angle(50%Imax): [C0/180]Total=34.1
[C90/270]Total=34.1
Field angle(10%Imax): [C0/180]Total=70.9
[C90/270]Total=70.9
Maximum s/h(1/2): C0_180=0.57 C90_270=0.57
Maximum s/h(1/4): C0_180=0.56 C90_270=0.56
Up flux rate of lamp(%): 0.00%
Down flux rate of lamp(%): 90.44%
Up flux rate of LUM(%): - -
Down flux rate of LUM(%): 100.00%
CIE Type : Direct lighting
Output flux ratio in π solid angle : 97.474%

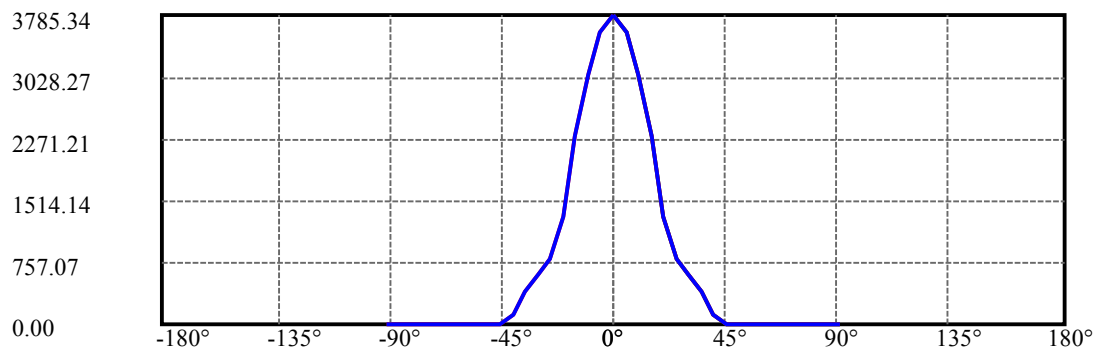
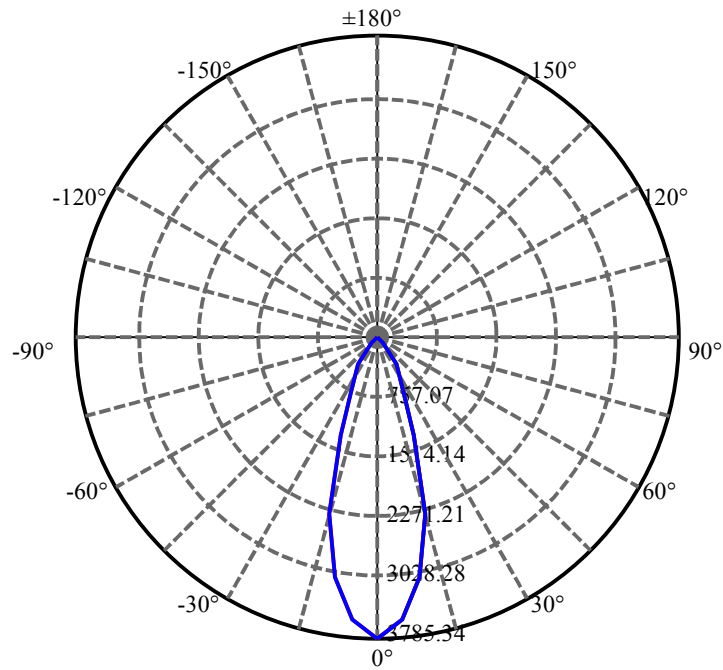
$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
0.0	3785.344	22.637	22.637	1.255%	1.406%
5.0	3562.523	170.194	192.831	9.434%	11.974%
10.0	3067.734	291.996	484.827	16.186%	30.106%
15.0	2296.969	325.867	810.694	18.064%	50.341%
20.0	1318.254	247.138	1057.833	13.699%	65.687%
25.0	806.555	186.841	1244.673	10.357%	77.289%
30.0	602.459	165.115	1409.788	9.153%	87.542%
35.0	404.241	127.093	1536.881	7.045%	95.434%
40.0	109.772	38.677	1575.558	2.144%	97.835%
45.0	11.679	4.527	1580.084	.251%	98.117%
50.0	7.995	3.357	1583.441	.186%	98.325%
55.0	7.545	3.388	1586.829	.188%	98.535%
60.0	7.320	3.475	1590.303	.193%	98.751%
65.0	7.130	3.542	1593.845	.196%	98.971%
70.0	7.003	3.607	1597.452	.200%	99.195%
75.0	6.926	3.667	1601.119	.203%	99.423%
80.0	6.877	3.712	1604.831	.206%	99.653%
85.0	6.820	3.724	1608.556	.206%	99.885%
90.0	6.785	1.860	1610.415	.103%	100.000%

ZONAL LUMEN SUMMARY

Zone	Lumens	%Lamp	%Fixt
0-30	1409.79	78.15%	87.54%
0-40	1575.56	87.34%	97.84%
0-60	1590.30	88.15%	98.75%
0-90	1608.56	89.17%	99.88%
0-120	1608.56	89.17%	99.88%
0-180	1610.42	89.27%	100.00%
60-90	21.73	1.20%	1.35%
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%
0-26.32	1288.33	71.42%	80.00%

ZONAL LUMEN SUMMARY

0-10	484.83
10-20	573.01
20-30	351.96
30-40	165.77
40-50	7.88
50-60	6.86
60-70	7.15
70-80	7.38
80-90	3.72
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:

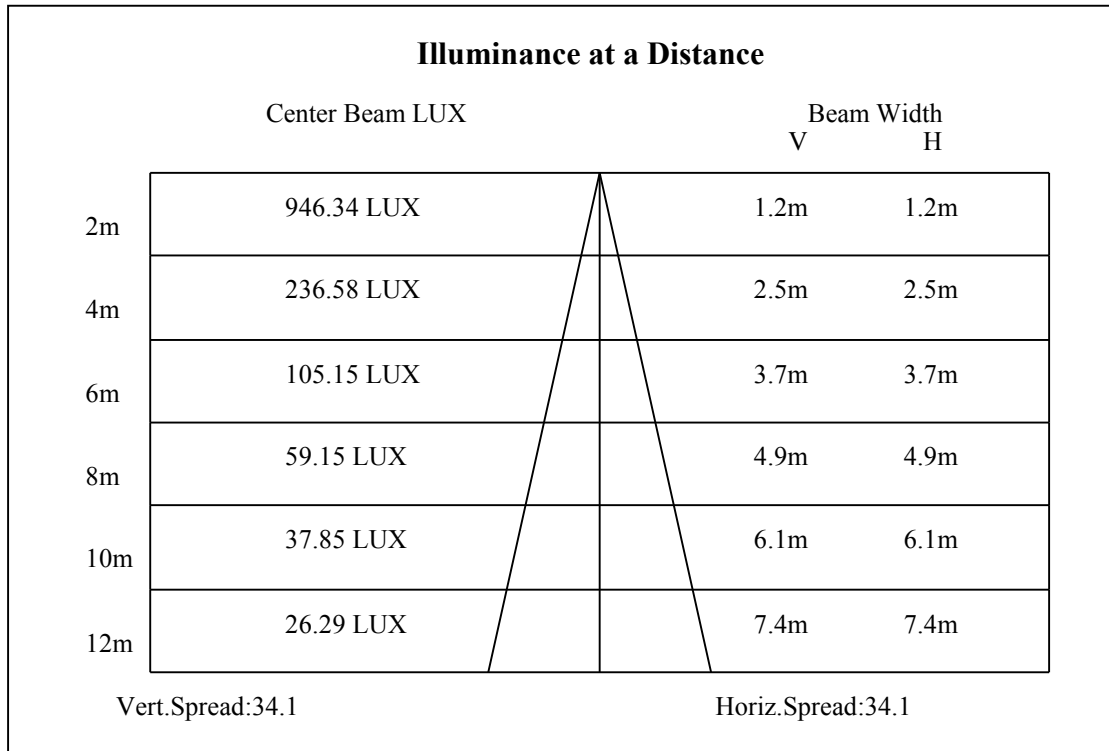
C90/C270:

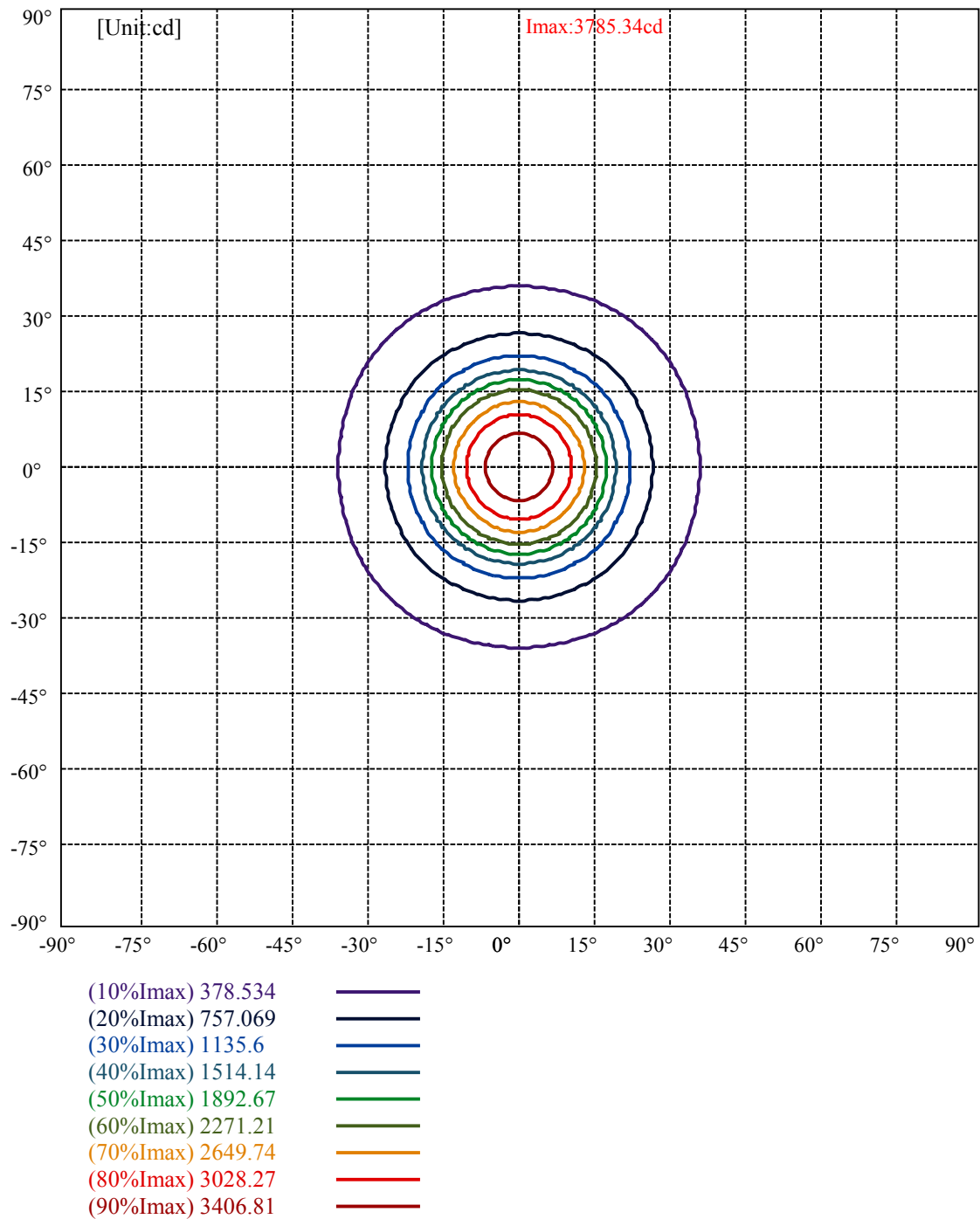
Field angle(10%Imax):C0/180Left:35.4 Right:35.4

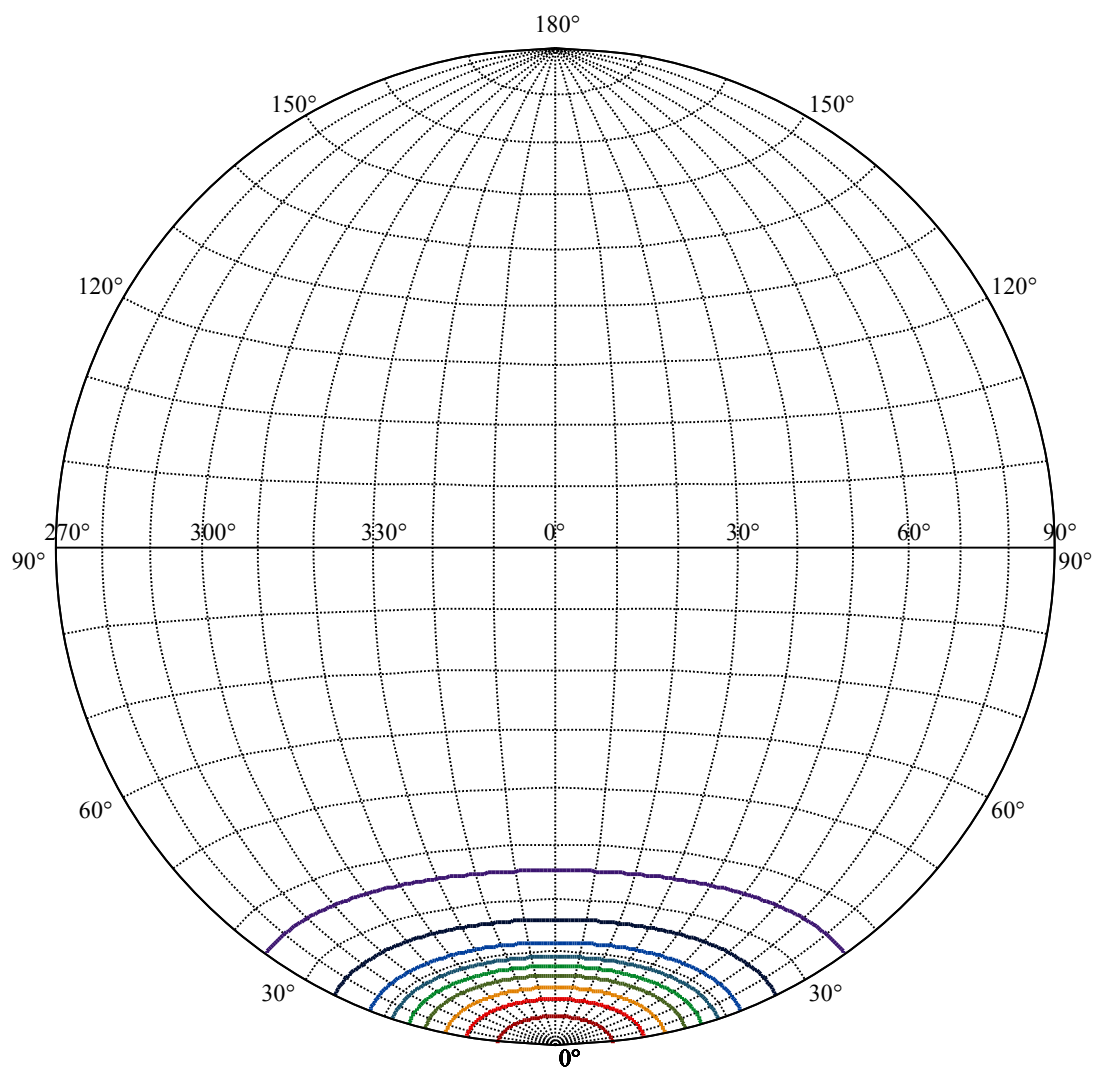
:C90/270Left:35.4 Right:35.4

Beam Angle(50%Imax):C0/180Left:17.1 Right:17.1

:C90/270Left:17.1 Right:17.1







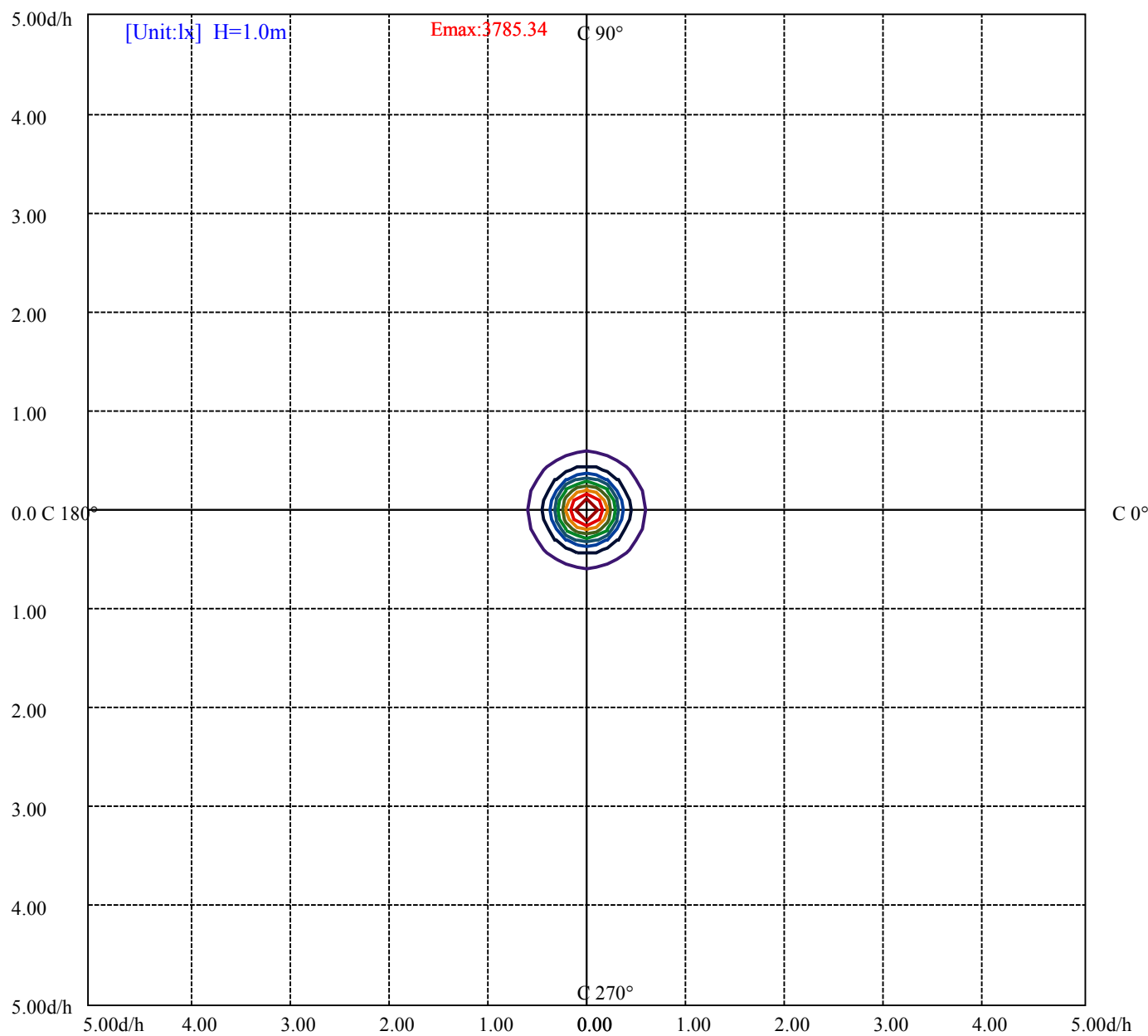
House

[Unit:cd]

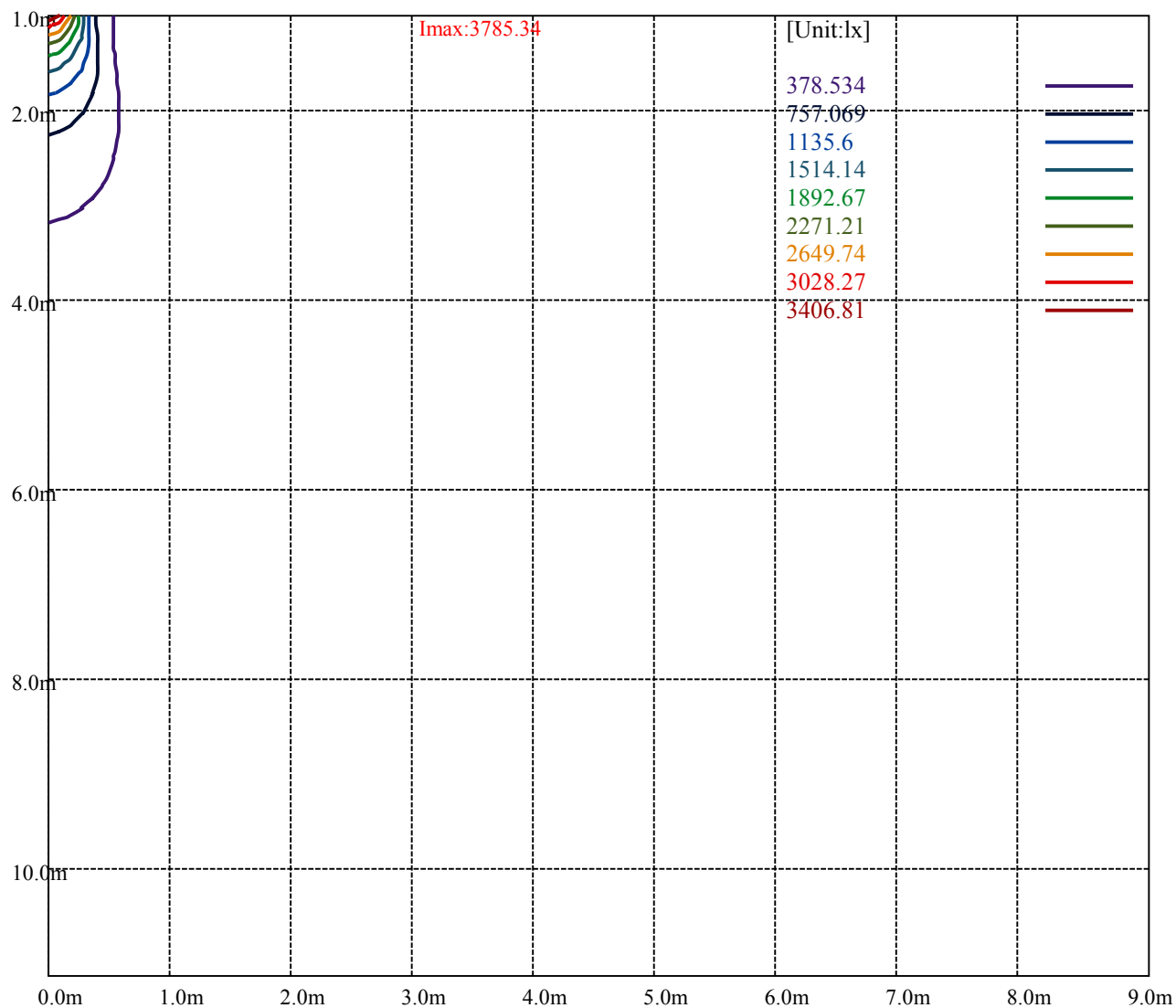
Road

Imax:3785.34

(10%Imax)	378.534	
(20%Imax)	757.069	
(30%Imax)	1135.6	
(40%Imax)	1514.14	
(50%Imax)	1892.67	
(60%Imax)	2271.21	
(70%Imax)	2649.74	
(80%Imax)	3028.27	
(90%Imax)	3406.81	



(10%Emax)	378.534	
(20%Emax)	757.067	
(30%Emax)	1135.6	
(40%Emax)	1514.13	
(50%Emax)	1892.67	
(60%Emax)	2271.2	
(70%Emax)	2649.74	
(80%Emax)	3028.27	
(90%Emax)	3406.8	



Luminance Table

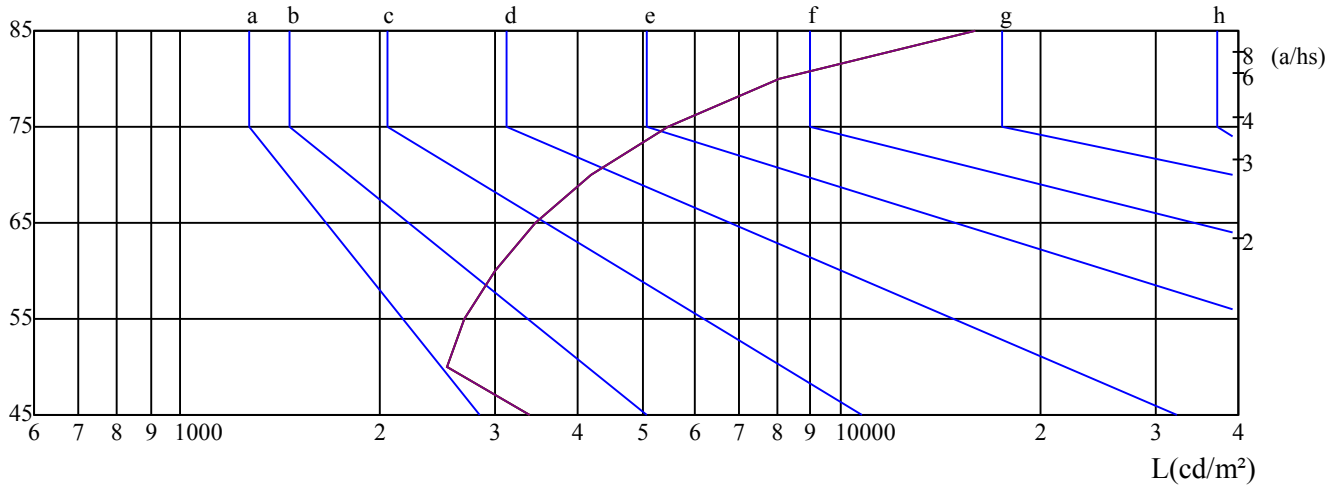
γ	45	50	55	60	65	70	75	80	85
C0	3371	2538	2684	2988	3443	4179	5461	8082	15970
C45	3371	2538	2684	2988	3443	4179	5461	8082	15970
C90	3371	2538	2684	2988	3443	4179	5461	8082	15970

L(Hor)(65)	L(Ver)(65)	L45(65)	L(Hor)(75)	L(Ver)(75)	L45(75)	L(Hor)(85)	L(Ver)(85)	L45(85)
3443	3443	3443	5461	5461	5461	15970	15970	15970

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

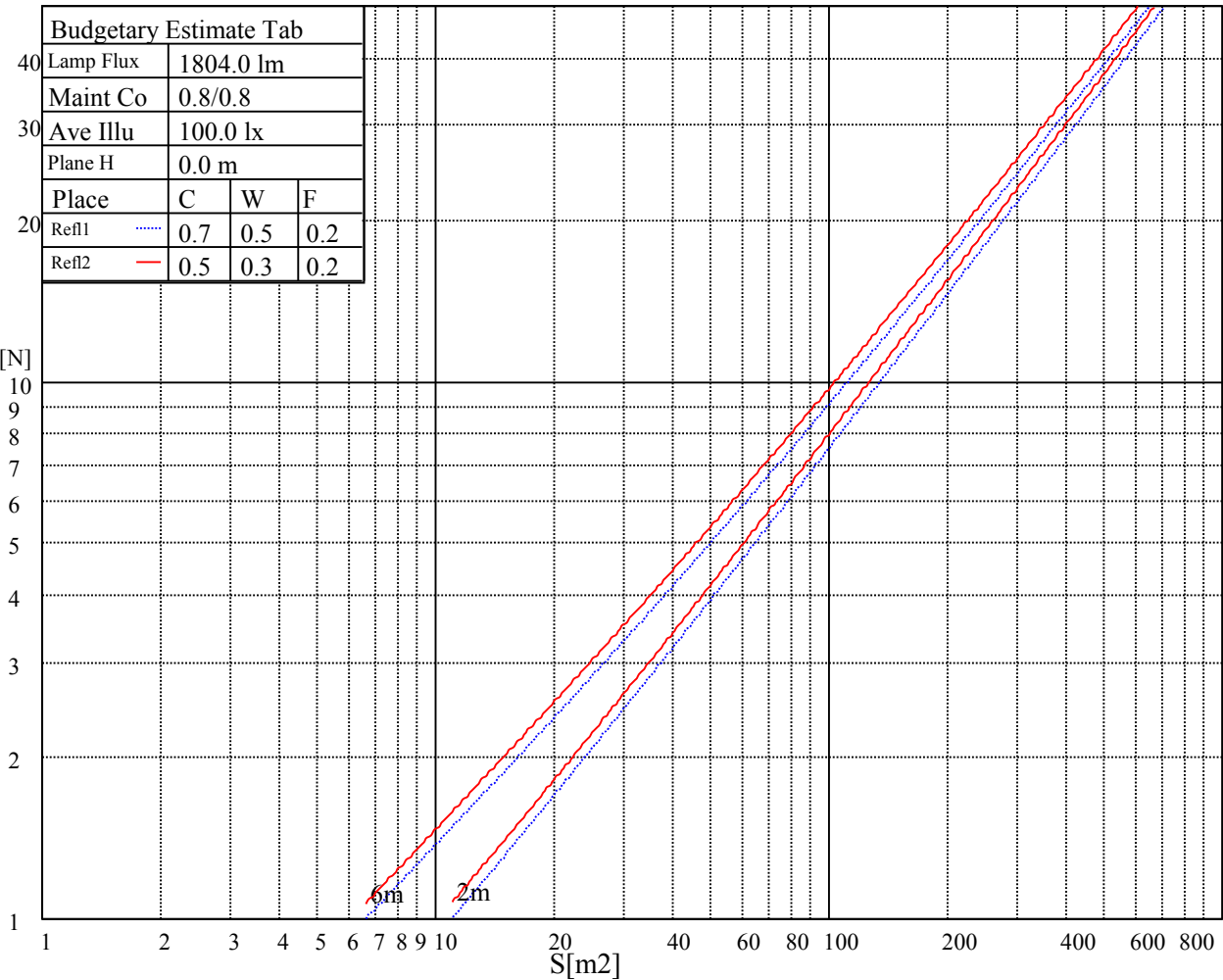
Luminance Limiting Curve

 $\gamma(^{\circ})$ 

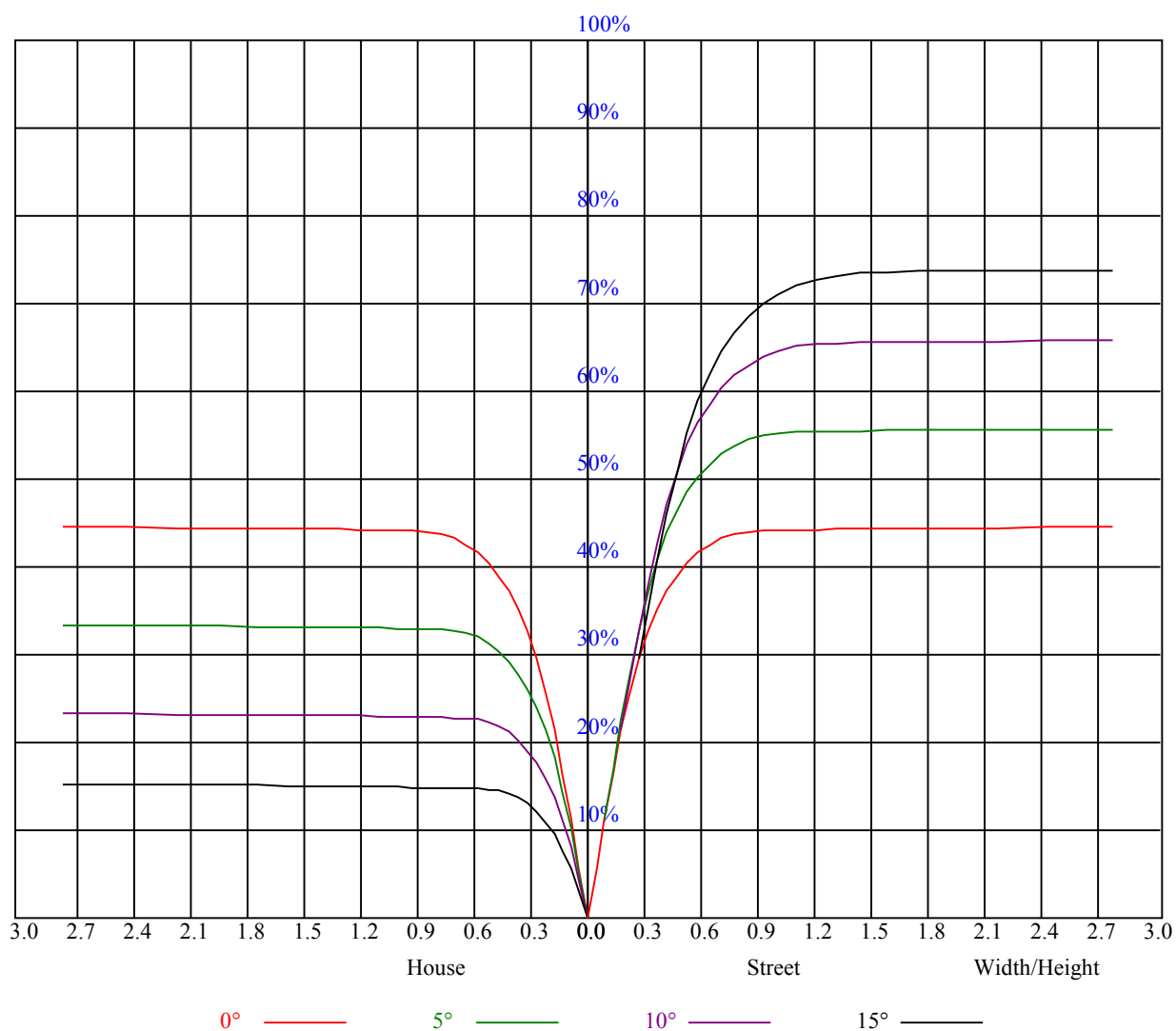
C0 ———

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	1.08	1.08	1.08	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	1.00	0.97	0.95	0.98	0.96	0.94	0.94	0.92	0.91	0.91	0.89	0.88	0.88	0.86	0.85	0.84
2	0.94	0.91	0.88	0.93	0.90	0.87	0.90	0.87	0.85	0.87	0.85	0.83	0.85	0.83	0.81	0.80
3	0.89	0.85	0.82	0.88	0.85	0.82	0.86	0.83	0.80	0.84	0.81	0.79	0.82	0.80	0.78	0.77
4	0.85	0.81	0.78	0.84	0.80	0.77	0.82	0.79	0.76	0.81	0.78	0.75	0.79	0.77	0.75	0.73
5	0.81	0.77	0.74	0.81	0.76	0.73	0.79	0.75	0.73	0.78	0.75	0.72	0.76	0.74	0.72	0.70
6	0.78	0.74	0.70	0.77	0.73	0.70	0.76	0.72	0.70	0.75	0.72	0.69	0.74	0.71	0.69	0.68
7	0.75	0.70	0.67	0.74	0.70	0.67	0.73	0.70	0.67	0.72	0.69	0.66	0.71	0.68	0.66	0.65
8	0.72	0.68	0.65	0.72	0.67	0.64	0.71	0.67	0.64	0.70	0.66	0.64	0.69	0.66	0.64	0.63
9	0.69	0.65	0.62	0.69	0.65	0.62	0.68	0.65	0.62	0.68	0.64	0.62	0.67	0.64	0.62	0.61
10	0.67	0.63	0.60	0.67	0.63	0.60	0.66	0.62	0.60	0.65	0.62	0.60	0.65	0.62	0.59	0.59



NATA 2-1676-M

Intensity data(cd)										Appendix Page: 14 Total:14	
C/γ(°)	0.0	5.0	10.0	15.0	20.0	25.0	30.0	35.0	40.0		
0.0	3782.81	3650.63	3184.88	2558.81	1614.94	877.50	641.81	486.56	284.06		
45.0	3779.44	3650.06	3217.50	2509.88	1635.75	889.88	635.63	473.06	202.39		
90.0	3791.25	3579.75	3065.06	2266.88	1108.86	782.44	586.97	378.68	72.28		
135.0	3787.88	3607.31	3136.50	2338.88	1449.56	802.13	598.50	421.31	87.75		
180.0	3782.81	3481.31	2939.63	2070.00	1083.94	729.90	564.08	328.11	39.15		
225.0	3779.44	3466.69	2917.13	2009.25	1102.11	749.14	570.66	326.42	27.39		
270.0	3791.25	3544.31	3075.75	2372.06	1461.38	828.00	623.81	424.13	82.35		
315.0	3787.88	3520.13	3005.44	2250.00	1089.51	793.46	598.22	395.66	82.80		
360.0	3782.81	3650.63	3184.88	2558.81	1614.94	877.50	641.81	486.56	284.06		
C/γ(°)	45.0	50.0	55.0	60.0	65.0	70.0	75.0	80.0	85.0		
0.0	13.84	8.16	7.59	7.37	7.14	7.03	6.92	6.92	6.81		
45.0	13.39	8.21	7.65	7.43	7.20	7.09	6.98	6.92	6.86		
90.0	11.14	7.99	7.59	7.37	7.14	6.98	6.92	6.81	6.81		
135.0	11.76	7.93	7.54	7.31	7.09	6.98	6.92	6.86	6.81		
180.0	9.84	7.82	7.48	7.26	7.09	6.98	6.92	6.86	6.81		
225.0	9.96	7.88	7.43	7.26	7.14	6.98	6.92	6.92	6.81		
270.0	11.81	8.04	7.59	7.31	7.14	7.03	6.92	6.86	6.86		
315.0	11.70	7.93	7.48	7.26	7.09	6.98	6.92	6.86	6.81		
360.0	13.84	8.16	7.59	7.37	7.14	7.03	6.92	6.92	6.81		
C/γ(°)	90.0										
0.0	6.81										
45.0	6.75										
90.0	6.81										
135.0	6.81										
180.0	6.75										
225.0	6.81										
270.0	6.75										
315.0	6.81										
360.0	6.81										