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NATA

LumCAT: 2-1940-M	
Luminaire: BJB 47.319.2021	
Report No: NATA0100	Voltage(V): 36.4000
Test No: GC2019011803	Current(A): 0.6000
LampCAT: CITIZEN CLU038	Power (W): 21.8400
Lamp flux(lm): 2492.0	PF: 0.0000
Number of Lamps: 1	Ballast type: DC
Length(mm): 78	Width(mm): 78
Phm Type: C	Height(mm): 0

Photometric Results

Lumens(lm): 2230.27
Efficiency(%): 89.50%
Lumens(lm)/Power(W): 103.22
Central intensity(cd): 4371.469
Maximum intensity(cd): 4371.469
Angle of maximum intensity: C=0.0 γ =0.0
Beam Angle(50%Imax): [C0/180]Total=39.9
[C90/270]Total=39.9
Field angle(10%Imax): [C0/180]Total=68.4
[C90/270]Total=68.4
Maximum s/h(1/2): C0_180=0.67 C90_270=0.67
Maximum s/h(1/4): C0_180=0.63 C90_270=0.63
Up flux rate of lamp(%): 0.00%
Down flux rate of lamp(%): 90.46%
Up flux rate of LUM(%): - -
Down flux rate of LUM(%): 100.00%
CIE Type : Direct lighting
Output flux ratio in π solid angle : 97.690%

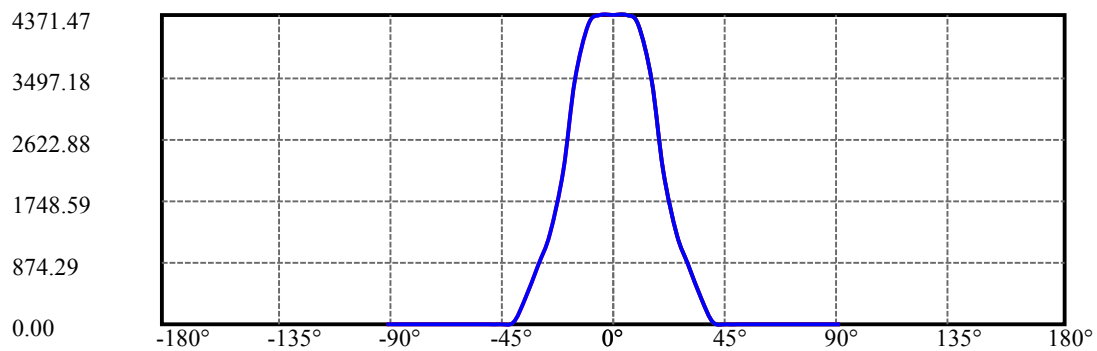
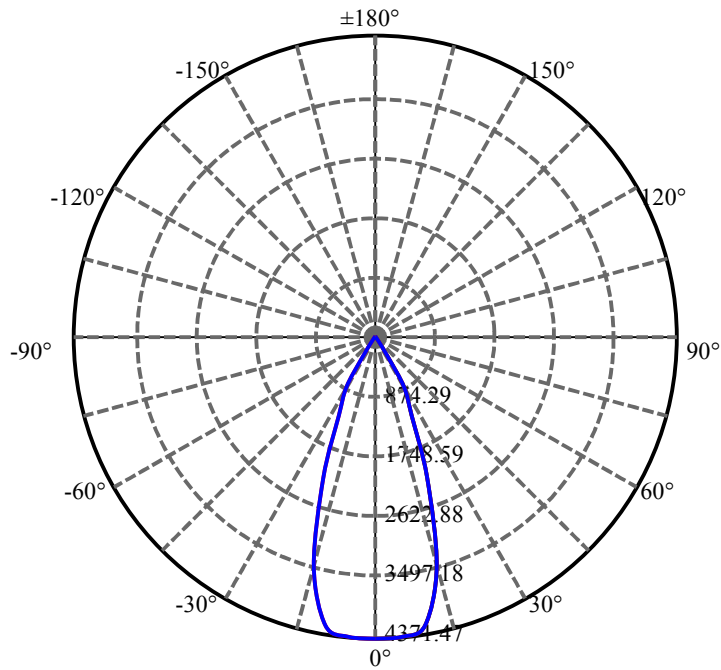
$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
0.0	4371.469	26.142	26.142	1.049%	1.172%
5.0	4363.242	208.447	234.589	8.365%	10.518%
10.0	4235.836	403.180	637.769	16.179%	28.596%
15.0	3443.063	488.462	1126.23	19.601%	50.497%
20.0	2171.180	407.040	1533.27	16.334%	68.748%
25.0	1264.535	292.933	1826.203	11.755%	81.882%
30.0	842.231	230.829	2057.033	9.263%	92.232%
35.0	359.557	113.044	2170.077	4.536%	97.301%
40.0	36.211	12.758	2182.835	.512%	97.873%
45.0	13.275	5.145	2187.981	.206%	98.104%
50.0	11.145	4.680	2192.66	.188%	98.313%
55.0	10.547	4.736	2197.396	.190%	98.526%
60.0	10.167	4.826	2202.222	.194%	98.742%
65.0	9.928	4.932	2207.154	.198%	98.963%
70.0	9.766	5.030	2212.185	.202%	99.189%
75.0	9.675	5.123	2217.307	.206%	99.419%
80.0	9.577	5.170	2222.477	.207%	99.650%
85.0	9.520	5.199	2227.675	.209%	99.883%
90.0	9.485	2.600	2230.275	.104%	100.000%

ZONAL LUMEN SUMMARY

Zone	Lumens	%Lamp	%Fixt
0-30	2057.03	82.55%	92.23%
0-40	2182.84	87.59%	97.87%
0-60	2202.22	88.37%	98.74%
0-90	2227.68	89.39%	99.88%
0-120	2227.68	89.39%	99.88%
0-180	2230.27	89.50%	100.00%
60-90	30.28	1.22%	1.36%
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%
0-24.28	1784.22	71.60%	80.00%

ZONAL LUMEN SUMMARY

0-10	637.77
10-20	895.50
20-30	523.76
30-40	125.80
40-50	9.82
50-60	9.56
60-70	9.96
70-80	10.29
80-90	5.20
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: —————

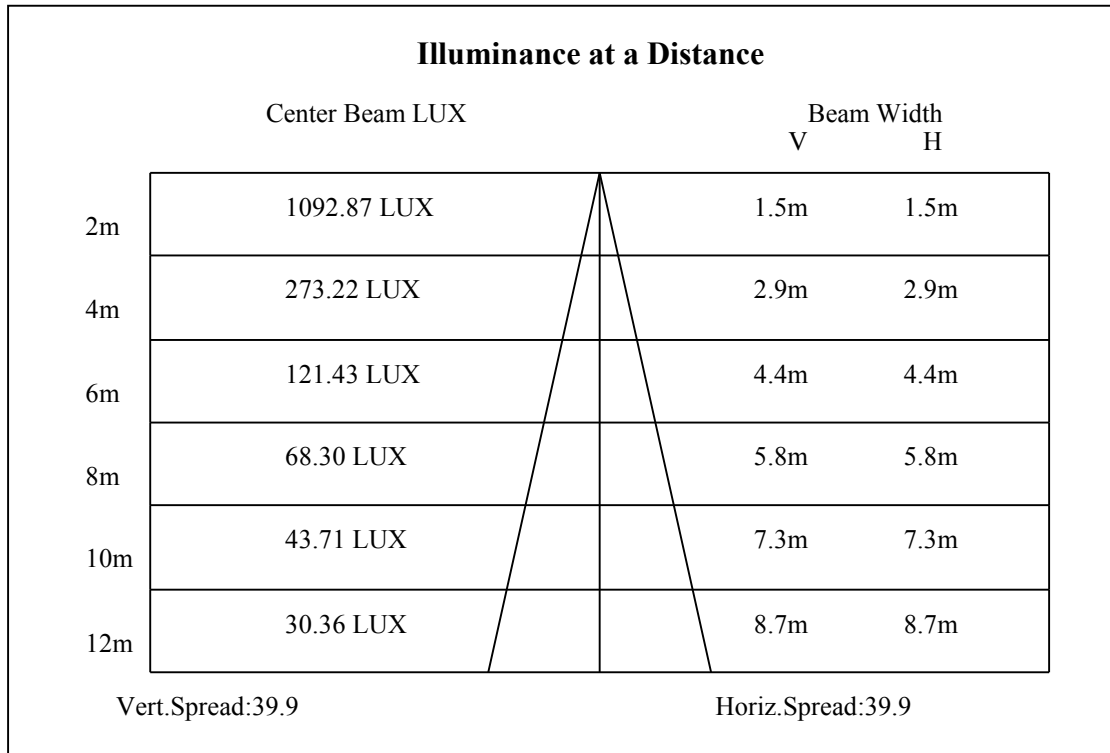
C90/C270: —————

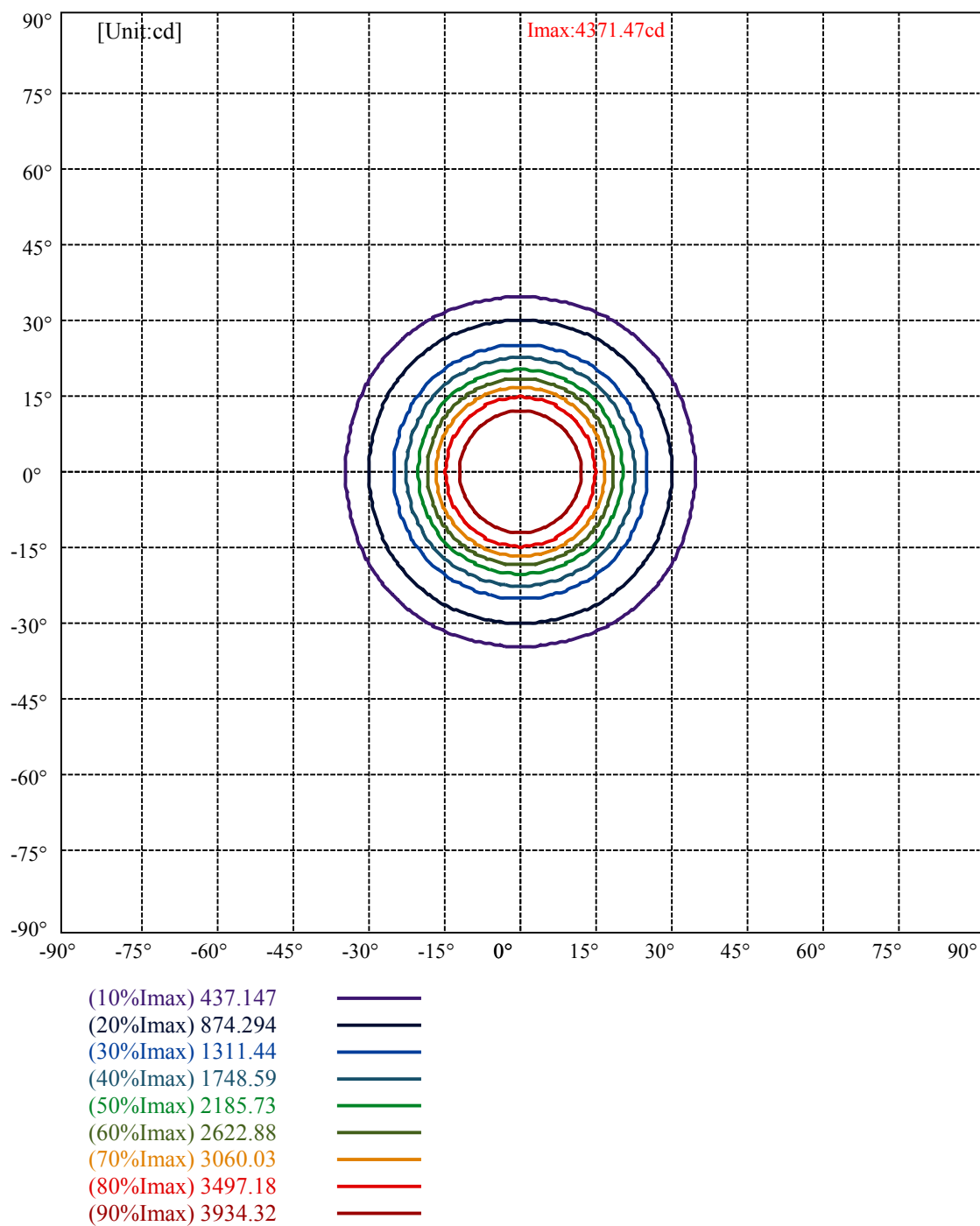
Field angle(10%Imax):C0/180Left:34.2 Right:34.2

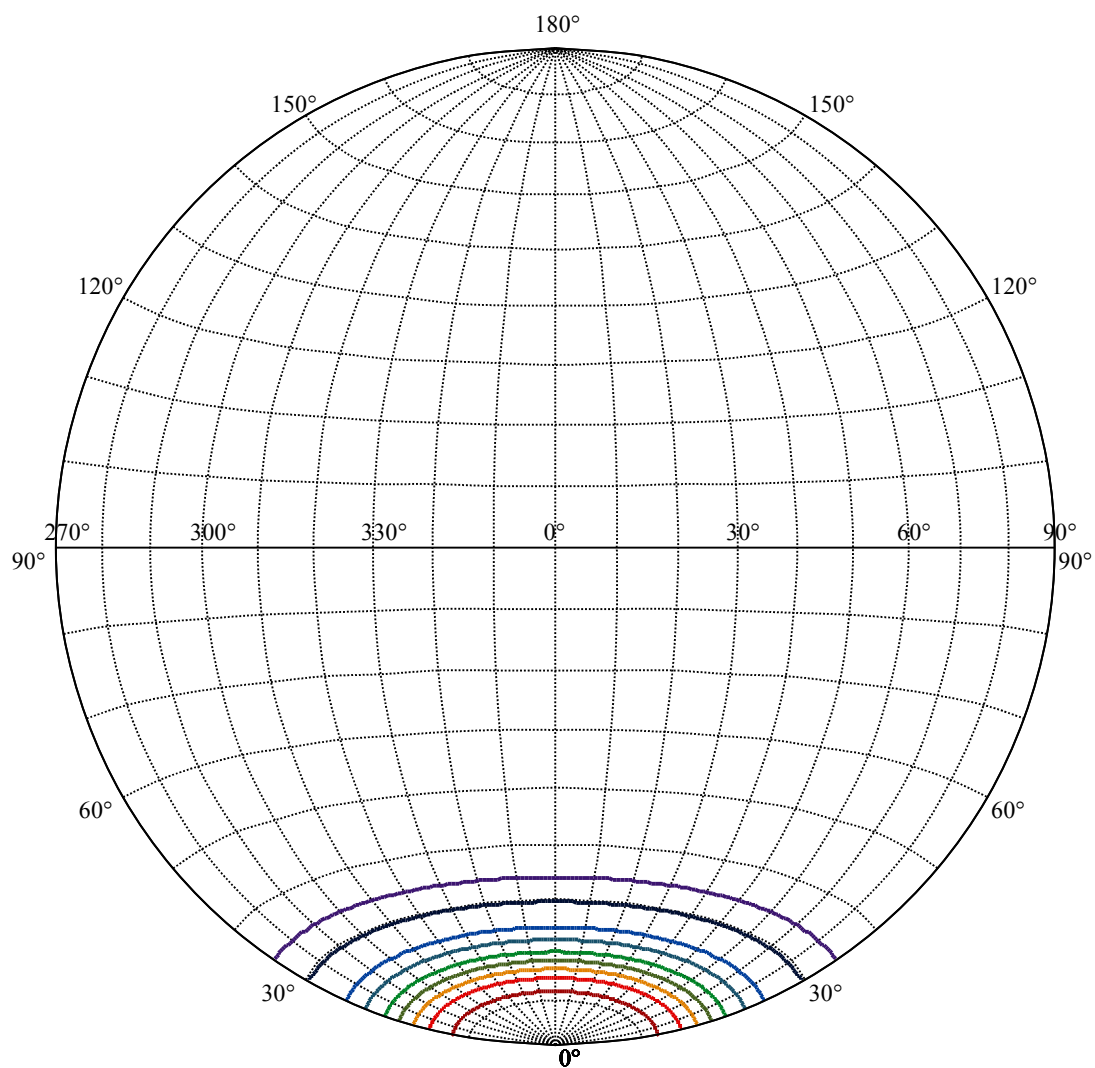
:C90/270Left:34.2 Right:34.2

Beam Angle(50%Imax):C0/180Left:19.9 Right:19.9

:C90/270Left:19.9 Right:19.9







House

[Unit:cd]

Road

Imax:4371.47

(10%Imax) 437.147

(20%Imax) 874.294

(30%Imax) 1311.44

(40%Imax) 1748.59

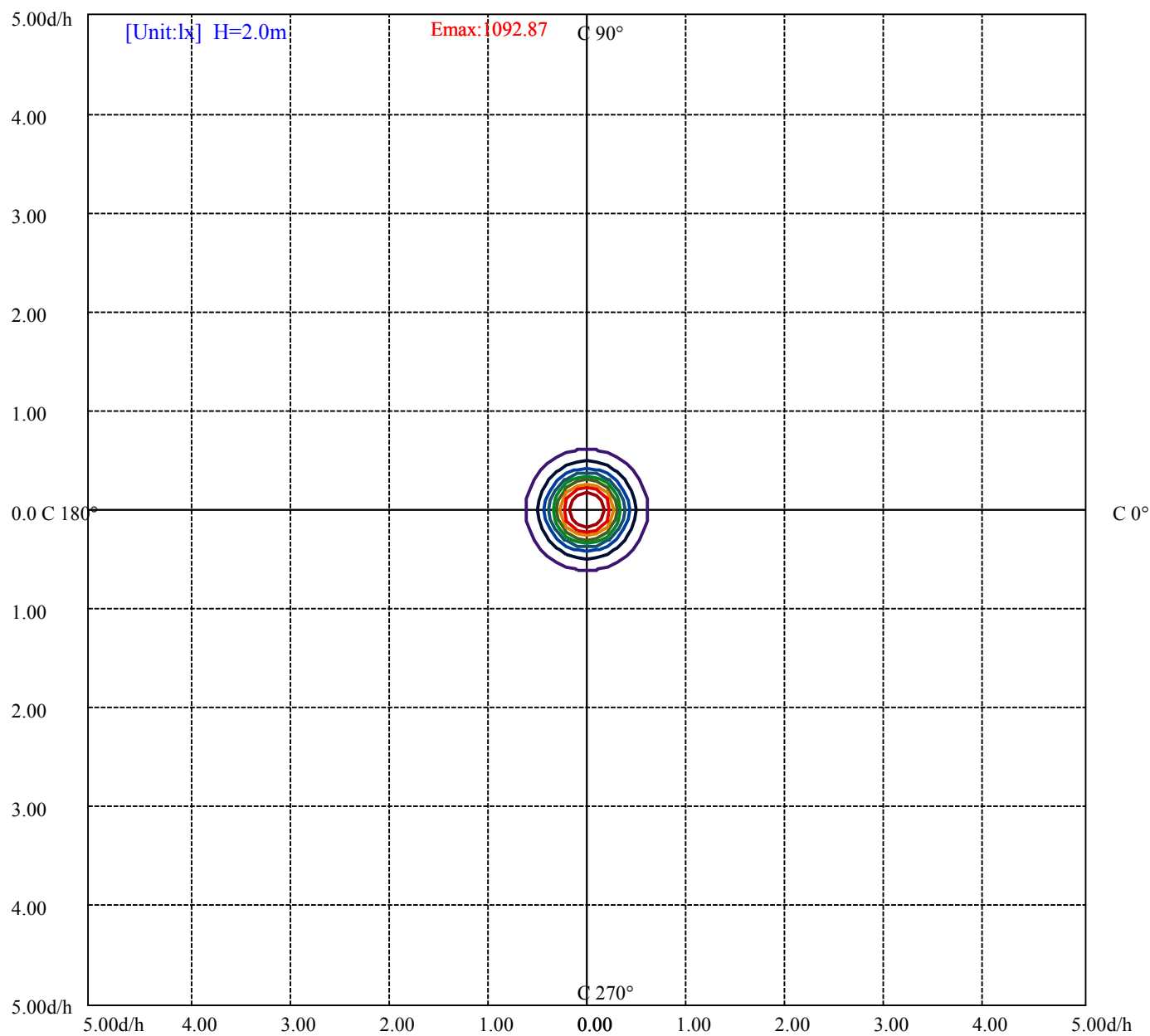
(50%Imax) 2185.73

(60%Imax) 2622.88

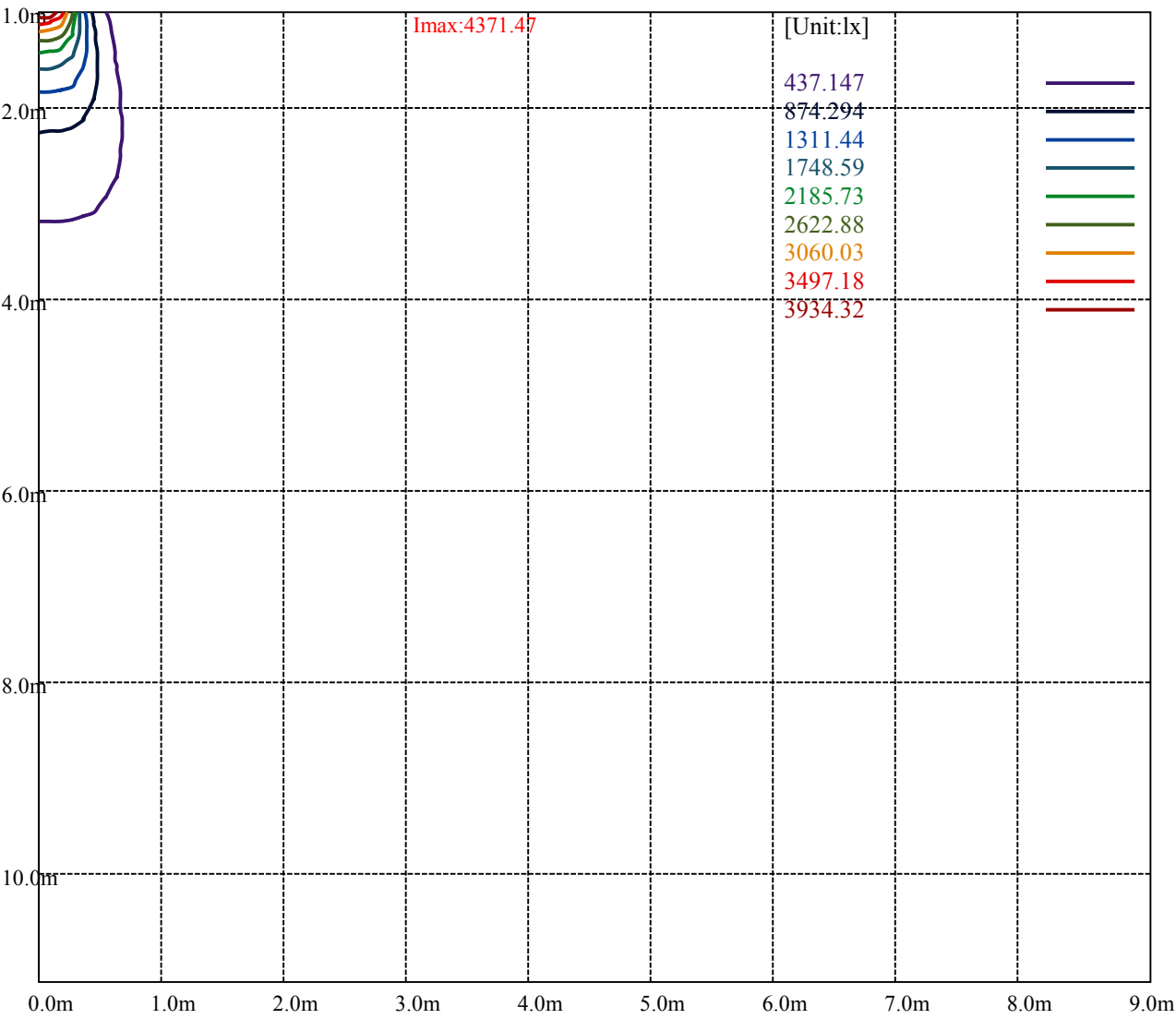
(70%Imax) 3060.03

(80%Imax) 3497.18

(90%Imax) 3934.32



(10%E _{max}) 109.2868	—
(20%E _{max}) 218.5735	—
(30%E _{max}) 327.86	—
(40%E _{max}) 437.1475	—
(50%E _{max}) 546.4325	—
(60%E _{max}) 655.72	—
(70%E _{max}) 765.0075	—
(80%E _{max}) 874.2925	—
(90%E _{max}) 983.58	—



Luminance Table

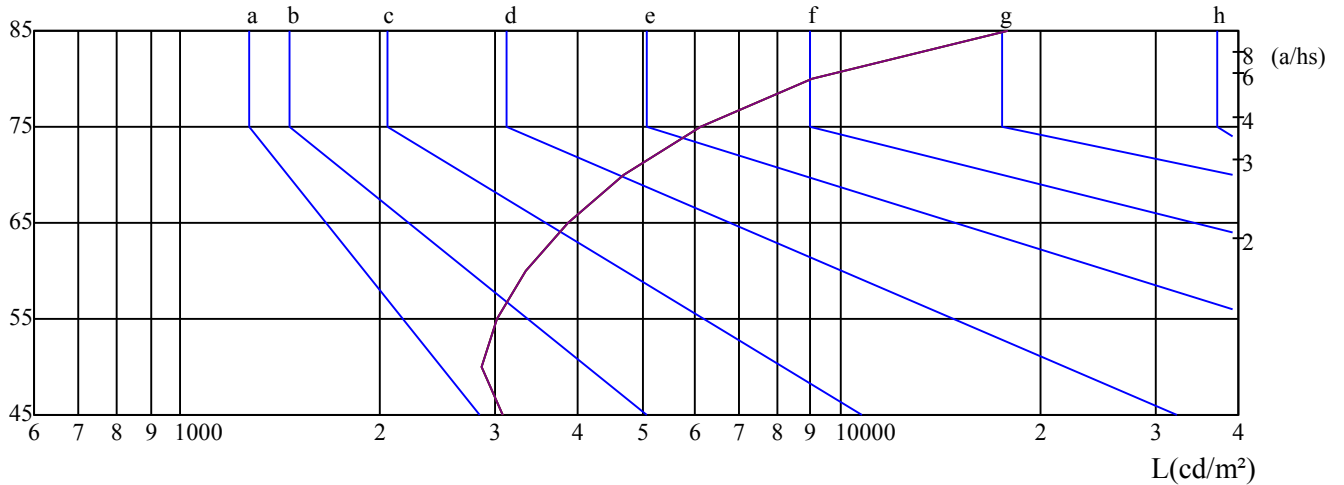
γ	45	50	55	60	65	70	75	80	85
C0	3086	2850	3022	3342	3861	4693	6144	9065	17954
C45	3086	2850	3022	3342	3861	4693	6144	9065	17954
C90	3086	2850	3022	3342	3861	4693	6144	9065	17954

L(Hor)(65)	L(Ver)(65)	L45(65)	L(Hor)(75)	L(Ver)(75)	L45(75)	L(Hor)(85)	L(Ver)(85)	L45(85)
3861	3861	3861	6144	6144	6144	17954	17954	17954

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

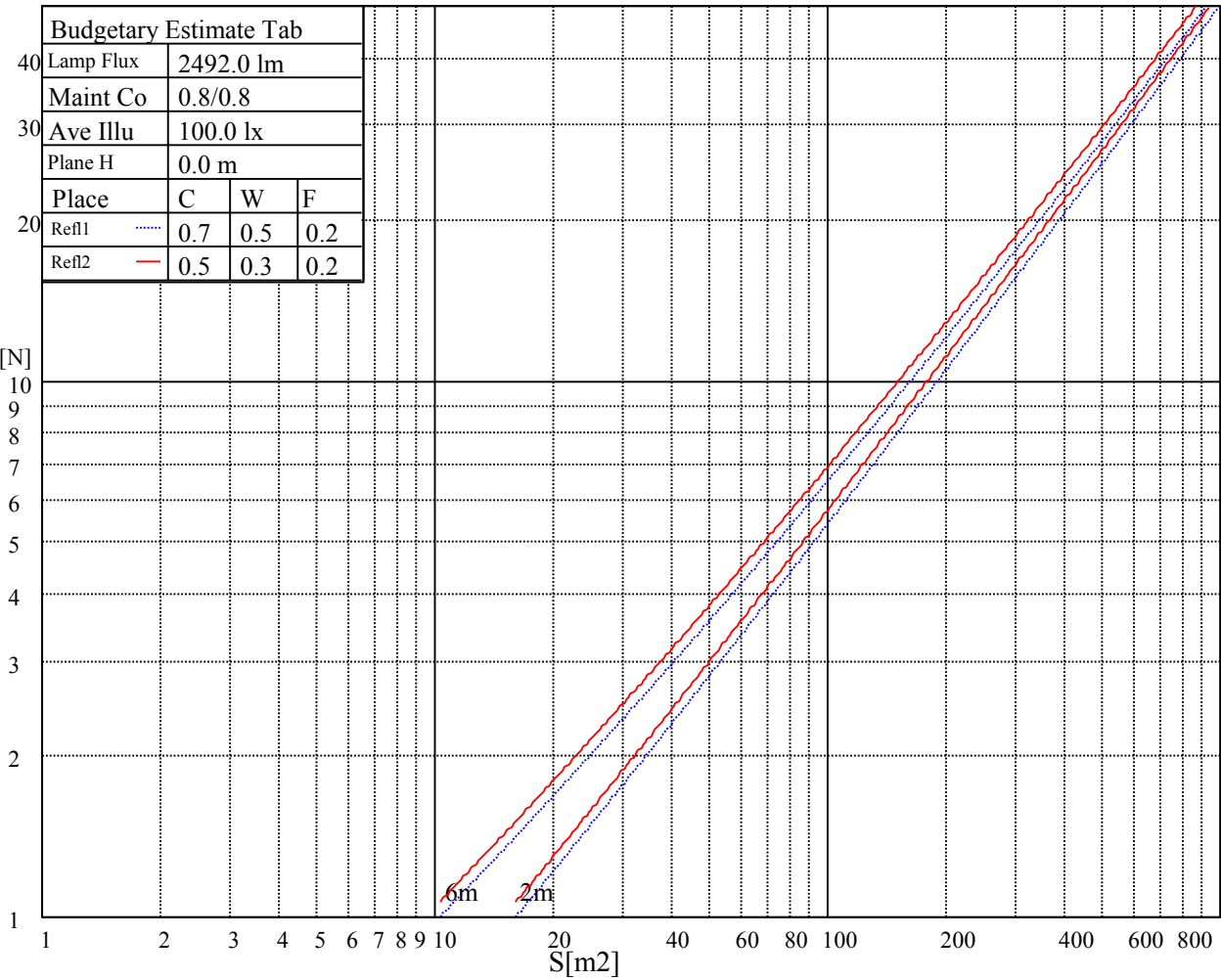
 $\gamma(^{\circ})$ 

C0 ———

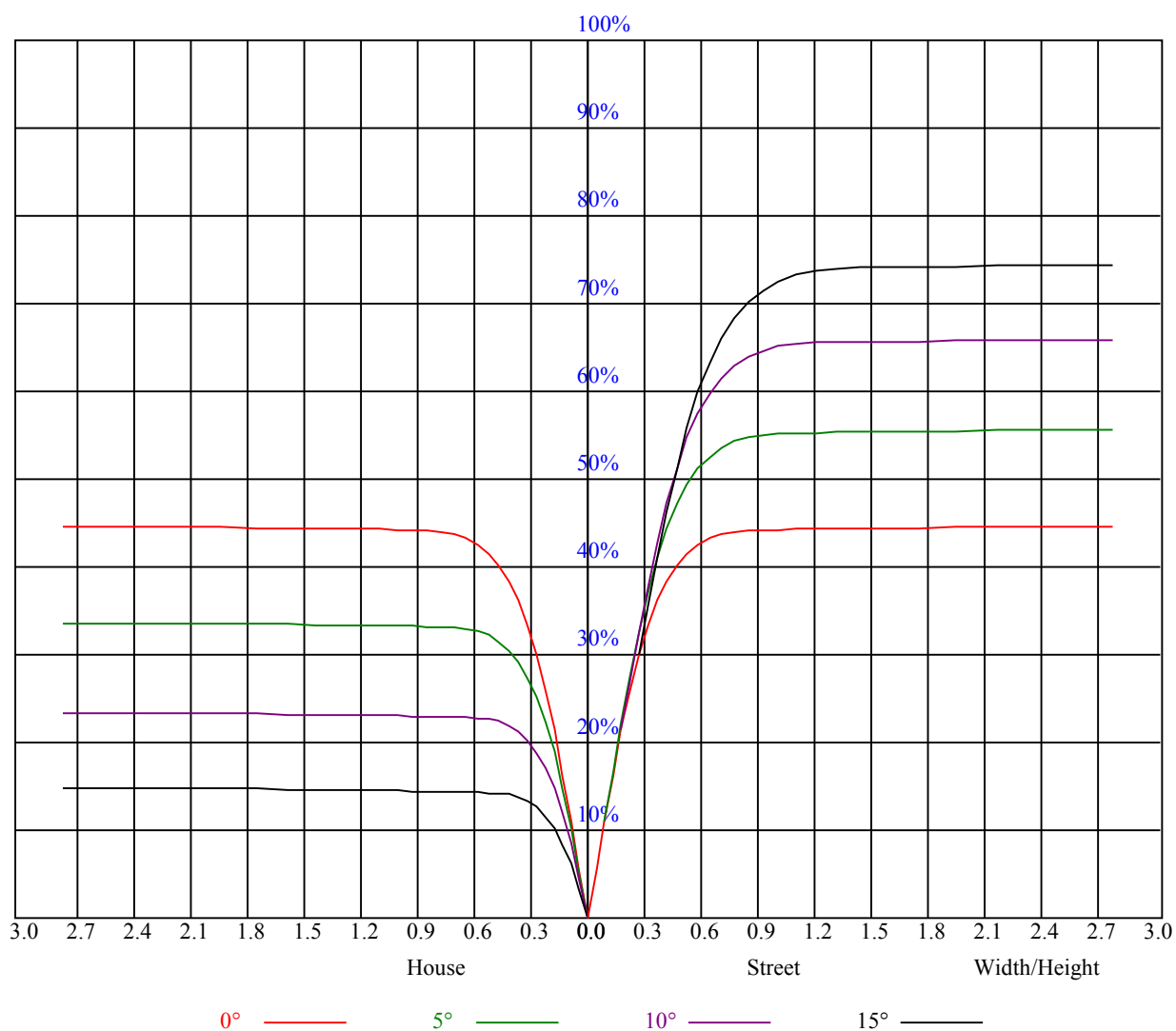
C45 ———

C90 ———

Illumination 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	1.90	2.81	2.27	3.12	3.44	1.95	2.86	2.32	3.17	3.49
	3H	5.19	6.00	5.58	6.33	6.70	5.23	6.04	5.61	6.37	6.74
	4H	6.97	7.71	7.38	8.07	8.46	7.03	7.77	7.43	8.13	8.52
	6H	8.96	9.64	9.38	10.01	10.41	9.02	9.71	9.44	10.08	10.48
	8H	10.06	10.69	10.49	11.09	11.50	10.13	10.77	10.57	11.16	11.57
	12H	11.84	12.45	12.27	12.83	13.26	11.91	12.52	12.35	12.91	13.34
4H	2H	2.84	3.58	3.24	3.93	4.33	2.87	3.62	3.28	3.97	4.36
	3H	6.35	6.96	6.77	7.37	7.78	6.39	7.00	6.80	7.41	7.82
	4H	8.29	8.84	8.73	9.26	9.71	8.34	8.89	8.78	9.31	9.76
	6H	10.44	10.90	10.91	11.36	11.83	10.51	10.97	10.98	11.42	11.90
	8H	11.64	12.07	12.12	12.52	13.00	11.70	12.14	12.18	12.59	13.07
	12H	13.31	13.69	13.81	14.18	14.65	13.38	13.76	13.88	14.25	14.73
8H	4H	9.03	9.47	9.51	9.92	10.39	9.07	9.50	9.55	9.96	10.43
	6H	11.45	11.79	11.96	12.30	12.78	11.50	11.84	12.01	12.35	12.83
	8H	12.84	13.14	13.37	13.66	14.16	12.89	13.19	13.42	13.71	14.21
	12H	14.64	14.90	15.17	15.40	15.99	14.70	14.96	15.23	15.46	16.04
12H	4H	9.24	9.62	9.74	10.11	10.58	9.28	9.65	9.77	10.14	10.62
	6H	11.97	12.07	12.31	12.55	13.10	12.02	12.12	12.35	12.59	13.14
	8H	13.29	13.55	13.81	14.05	14.63	13.34	13.59	13.86	14.09	14.68
Variation with the observer position at spacings:											
S = 1.0H		5.7/-6.3					5.7/-6.3				
S = 1.5H		7.6/-4.6					7.6/-4.6				
S = 2.0H		8.8/-3.3					8.8/-3.3				
Standard tables:		BK3					BK3				
Uncorrected UGR		-0.1					-0.1				



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	1.01	1.01	1.01	0.96	0.96	0.96	0.92	0.92	0.92	0.90
1	1.00	0.98	0.96	0.98	0.96	0.94	0.94	0.93	0.91	0.91	0.90	0.89	0.88	0.87	0.86	0.84
2	0.95	0.91	0.89	0.93	0.90	0.88	0.90	0.88	0.86	0.88	0.86	0.84	0.85	0.84	0.82	0.81
3	0.90	0.86	0.83	0.89	0.85	0.82	0.87	0.84	0.81	0.84	0.82	0.80	0.82	0.80	0.79	0.77
4	0.86	0.82	0.79	0.85	0.81	0.78	0.83	0.80	0.77	0.81	0.79	0.76	0.80	0.77	0.76	0.74
5	0.82	0.78	0.75	0.81	0.77	0.74	0.80	0.76	0.74	0.79	0.76	0.73	0.77	0.75	0.73	0.71
6	0.79	0.75	0.71	0.78	0.74	0.71	0.77	0.73	0.71	0.76	0.73	0.70	0.75	0.72	0.70	0.69
7	0.76	0.72	0.69	0.75	0.71	0.68	0.74	0.71	0.68	0.73	0.70	0.68	0.72	0.70	0.67	0.66
8	0.73	0.69	0.66	0.73	0.69	0.66	0.72	0.68	0.65	0.71	0.68	0.65	0.70	0.67	0.65	0.64
9	0.71	0.66	0.63	0.70	0.66	0.63	0.69	0.66	0.63	0.69	0.65	0.63	0.68	0.65	0.63	0.62
10	0.68	0.64	0.61	0.68	0.64	0.61	0.67	0.64	0.61	0.67	0.63	0.61	0.66	0.63	0.61	0.60



NATA 2-1940-M

Intensity data(cd)										Appendix Page: 15 Total:15	
C/ γ (°)	0.0	5.0	10.0	15.0	20.0	25.0	30.0	35.0	40.0		
0.0	4370.63	4392.56	4349.81	3812.63	2587.50	1536.19	972.56	532.13	81.00		
45.0	4374.00	4275.56	4190.63	3498.19	2171.25	1289.81	873.56	344.81	22.56		
90.0	4365.00	4214.81	4007.25	2984.06	1843.31	1080.79	646.54	193.33	18.06		
135.0	4376.25	4285.13	4137.75	3296.81	1982.25	1131.75	783.00	303.75	19.46		
180.0	4370.63	4319.44	4059.00	3044.81	1797.75	1071.39	682.71	182.64	16.65		
225.0	4374.00	4414.50	4180.50	3403.13	2102.06	1099.35	840.15	333.56	21.21		
270.0	4365.00	4491.00	4497.19	3853.13	2599.88	1510.31	996.19	570.38	66.54		
315.0	4376.25	4512.94	4464.56	3651.75	2285.44	1396.69	943.14	415.86	44.21		
360.0	4370.63	4392.56	4349.81	3812.63	2587.50	1536.19	972.56	532.13	81.00		
C/ γ (°)	45.0	50.0	55.0	60.0	65.0	70.0	75.0	80.0	85.0		
0.0	15.24	11.48	10.80	10.29	10.01	9.90	9.79	9.68	9.62		
45.0	13.33	11.03	10.52	10.13	9.84	9.68	9.62	9.51	9.45		
90.0	11.59	10.86	10.41	10.07	9.84	9.73	9.62	9.51	9.45		
135.0	12.66	11.08	10.58	10.18	9.96	9.79	9.68	9.62	9.56		
180.0	11.93	11.03	10.46	10.18	9.96	9.79	9.73	9.68	9.62		
225.0	12.32	10.91	10.35	10.07	9.84	9.68	9.56	9.51	9.45		
270.0	15.13	11.42	10.58	10.18	9.96	9.73	9.68	9.56	9.51		
315.0	14.01	11.36	10.69	10.24	10.01	9.84	9.73	9.56	9.51		
360.0	15.24	11.48	10.80	10.29	10.01	9.90	9.79	9.68	9.62		
C/ γ (°)	90.0										
0.0	9.56										
45.0	9.39										
90.0	9.45										
135.0	9.51										
180.0	9.56										
225.0	9.45										
270.0	9.45										
315.0	9.51										
360.0	9.56										