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NATA

LumCAT: 3-1942-M	
Luminaire: BJB 47.319.2011	
Report No: NATA0100	Voltage(V): 35.8000
Test No: GC2018102609	Current(A): 0.6000
LampCAT: LUMILEDS LUXEON 1205	Power (W): 21.4800
Lamp flux(lm): 3003.0	PF: 0.0000
Number of Lamps: 1	Ballast type: DC
Length(mm): 86	Width(mm): 86
Phm Type: C	Height(mm): 0

Photometric Results

Lumens(lm): 2702.62
Efficiency(%): 90.00%
Lumens(lm)/Power(W): 125.95
Central intensity(cd): 12459.380
Maximum intensity(cd): 12459.380
Angle of maximum intensity: C=0.0 γ =0.0
Beam Angle(50%Imax): [C0/180]Total=14.0
[C90/270]Total=14.0
Field angle(10%Imax): [C0/180]Total=58.4
[C90/270]Total=58.4
Maximum s/h(1/2): C0_180=0.24 C90_270=0.24
Maximum s/h(1/4): C0_180=0.33 C90_270=0.33
Up flux rate of lamp(%): 0.00%
Down flux rate of lamp(%): 90.09%
Up flux rate of LUM(%): - -
Down flux rate of LUM(%): 100.00%
CIE Type : Direct lighting
Output flux ratio in π solid angle : 98.577%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
0.0	12459.375	2.981	2.981	.099%	.110%
1.0	12252.164	23.449	26.43	.781%	.978%
2.0	11801.602	45.166	71.596	1.504%	2.649%
3.0	10868.555	62.377	133.973	2.077%	4.957%
4.0	9905.203	75.770	209.743	2.523%	7.761%
5.0	8621.156	82.397	292.14	2.744%	10.810%
6.0	7312.992	83.827	375.967	2.791%	13.911%
7.0	6207.328	82.957	458.923	2.762%	16.981%
8.0	5346.563	81.598	540.522	2.717%	20.000%
9.0	4618.195	79.224	619.746	2.638%	22.931%
10.0	4150.969	79.044	698.79	2.632%	25.856%
11.0	3839.625	80.341	779.132	2.675%	28.829%
12.0	3590.930	81.872	861.004	2.726%	31.858%
13.0	3389.063	83.603	944.606	2.784%	34.952%
14.0	3217.430	85.356	1029.963	2.842%	38.110%
15.0	3057.820	86.788	1116.751	2.890%	41.321%
16.0	2923.172	88.358	1205.109	2.942%	44.590%
17.0	2761.383	88.535	1293.643	2.948%	47.866%
18.0	2605.289	88.286	1381.929	2.940%	51.133%
19.0	2468.672	88.137	1470.066	2.935%	54.394%
20.0	2319.398	86.992	1557.058	2.897%	57.613%
21.0	2172.586	85.380	1642.438	2.843%	60.772%
22.0	2043.141	83.932	1726.369	2.795%	63.878%
23.0	1907.930	81.751	1808.12	2.722%	66.903%
24.0	1775.672	79.200	1887.321	2.637%	69.833%
25.0	1655.930	76.744	1964.064	2.556%	72.673%
26.0	1548.070	74.419	2038.483	2.478%	75.426%
27.0	1442.953	71.837	2110.321	2.392%	78.084%
28.0	1349.578	69.480	2179.801	2.314%	80.655%
29.0	1262.538	67.122	2246.923	2.235%	83.139%
30.0	1183.669	64.901	2311.824	2.161%	85.540%
31.0	1096.889	61.952	2373.776	2.063%	87.833%
32.0	993.052	57.708	2431.484	1.922%	89.968%
33.0	866.918	51.777	2483.261	1.724%	91.884%
34.0	727.966	44.640	2527.901	1.487%	93.535%
35.0	574.305	36.123	2564.024	1.203%	94.872%
36.0	426.734	27.506	2591.53	.916%	95.890%
37.0	315.984	20.854	2612.384	.694%	96.661%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
38.0	184.641	12.466	2624.849	.415%	97.123%
39.0	110.798	7.646	2632.496	.255%	97.405%
40.0	57.473	4.051	2636.547	.135%	97.555%
41.0	40.247	2.896	2639.443	.096%	97.662%
42.0	34.144	2.505	2641.948	.083%	97.755%
43.0	29.482	2.205	2644.153	.073%	97.837%
44.0	25.685	1.957	2646.109	.065%	97.909%
45.0	22.690	1.759	2647.869	.059%	97.974%
46.0	20.250	1.597	2649.466	.053%	98.033%
47.0	18.499	1.484	2650.95	.049%	98.088%
48.0	17.248	1.406	2652.355	.047%	98.140%
49.0	16.207	1.341	2653.697	.045%	98.190%
50.0	15.427	1.296	2654.993	.043%	98.238%
51.0	14.878	1.268	2656.261	.042%	98.285%
52.0	14.449	1.249	2657.509	.042%	98.331%
53.0	14.048	1.230	2658.74	.041%	98.377%
54.0	13.711	1.216	2659.956	.041%	98.422%
55.0	13.359	1.200	2661.156	.040%	98.466%
56.0	13.029	1.184	2662.341	.039%	98.510%
57.0	12.748	1.172	2663.513	.039%	98.553%
58.0	12.530	1.165	2664.678	.039%	98.596%
59.0	12.382	1.164	2665.842	.039%	98.639%
60.0	12.248	1.163	2667.005	.039%	98.682%
61.0	12.136	1.164	2668.169	.039%	98.725%
62.0	12.052	1.167	2669.336	.039%	98.769%
63.0	11.974	1.170	2670.506	.039%	98.812%
64.0	11.876	1.171	2671.677	.039%	98.855%
65.0	11.805	1.173	2672.85	.039%	98.899%
66.0	11.770	1.179	2674.029	.039%	98.942%
67.0	11.700	1.181	2675.21	.039%	98.986%
68.0	11.658	1.185	2676.395	.039%	99.030%
69.0	11.630	1.191	2677.586	.040%	99.074%
70.0	11.566	1.192	2678.778	.040%	99.118%
71.0	11.517	1.194	2679.972	.040%	99.162%
72.0	11.510	1.200	2681.173	.040%	99.207%
73.0	11.489	1.205	2682.377	.040%	99.251%
74.0	11.454	1.207	2683.585	.040%	99.296%
75.0	11.440	1.212	2684.797	.040%	99.341%

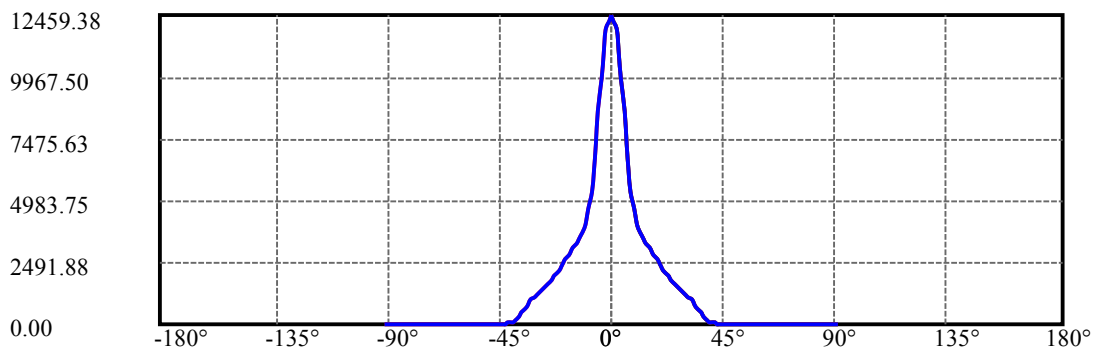
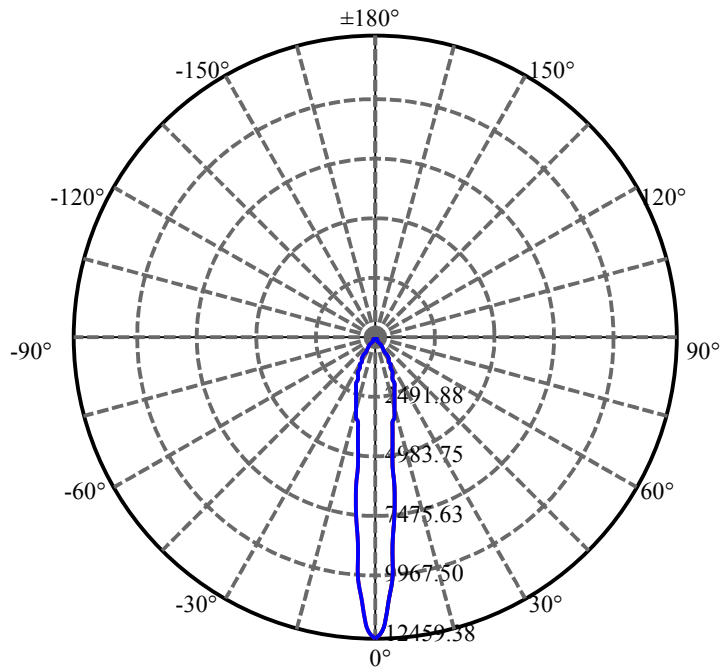
$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
76.0	11.419	1.215	2686.012	.040%	99.386%
77.0	11.405	1.219	2687.23	.041%	99.431%
78.0	11.391	1.222	2688.452	.041%	99.476%
79.0	11.363	1.223	2689.675	.041%	99.521%
80.0	11.348	1.226	2690.901	.041%	99.566%
81.0	11.341	1.228	2692.129	.041%	99.612%
82.0	11.341	1.232	2693.361	.041%	99.658%
83.0	11.320	1.232	2694.593	.041%	99.703%
84.0	11.313	1.234	2695.827	.041%	99.749%
85.0	11.306	1.235	2697.062	.041%	99.794%
86.0	11.292	1.235	2698.297	.041%	99.840%
87.0	11.278	1.235	2699.532	.041%	99.886%
88.0	11.264	1.234	2700.767	.041%	99.932%
89.0	11.250	1.233	2702	.041%	99.977%
90.0	11.243	0.616	2702.617	.021%	100.000%

ZONAL LUMEN SUMMARY

Zone	Lumens	%Lamp	%Fixt
0-30	2311.82	76.98%	85.54%
0-40	2636.55	87.80%	97.56%
0-60	2667.01	88.81%	98.68%
0-90	2702.00	89.98%	99.98%
0-120	2702.00	89.98%	99.98%
0-180	2702.62	90.00%	100.00%
60-90	36.16	1.20%	1.34%
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%
0-27.75	2162.09	72.00%	80.00%

ZONAL LUMEN SUMMARY

0-10	698.79
10-20	858.27
20-30	754.77
30-40	324.72
40-50	18.45
50-60	12.01
60-70	11.77
70-80	12.12
80-90	11.10
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



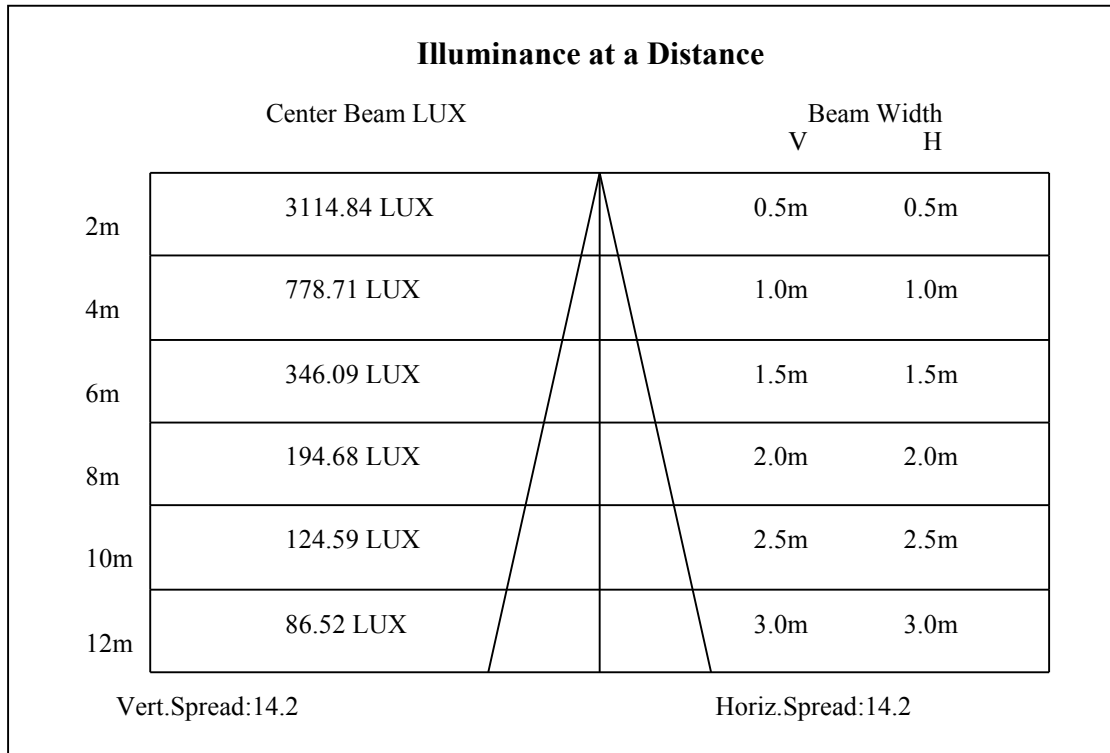
C0(Max): —————

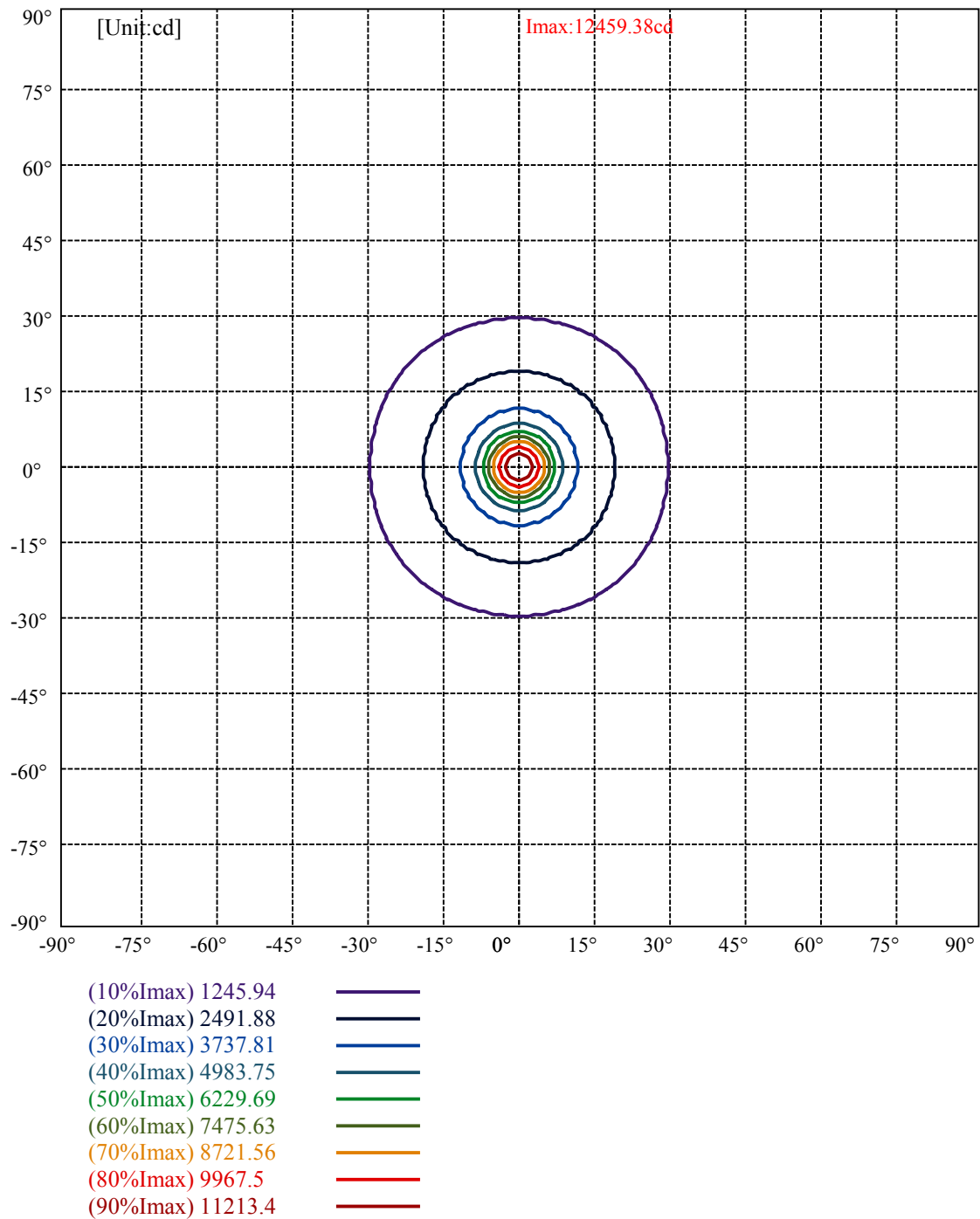
C0/C180: —————

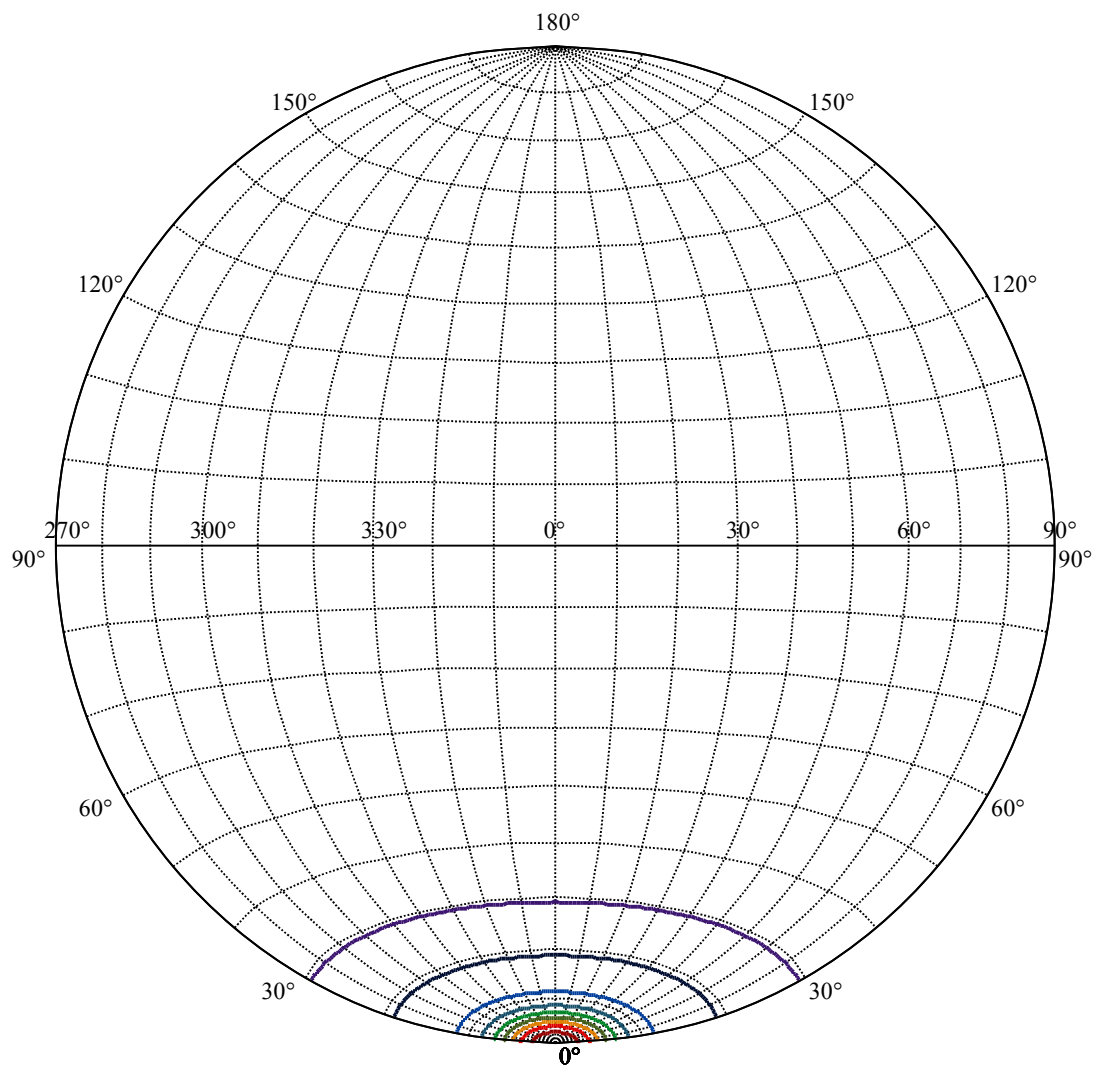
C90/C270: —————

Field angle(10%Imax):C0/180Left:29.2 Right:29.2
:C90/270Left:29.2 Right:29.2

Beam Angle(50%Imax):C0/180Left:7.0 Right:7.0
:C90/270Left:7.0 Right:7.0







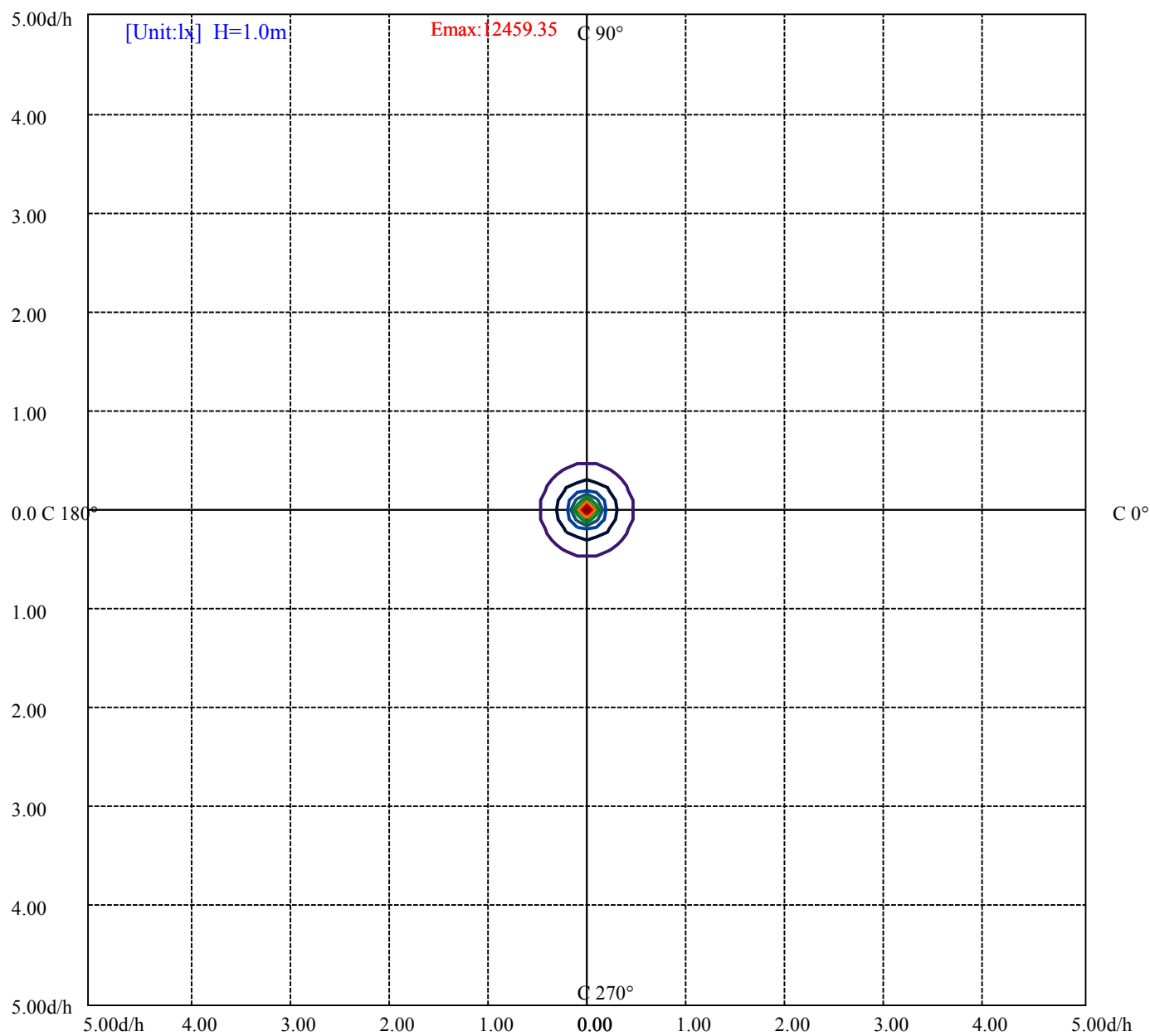
House

[Unit:cd]

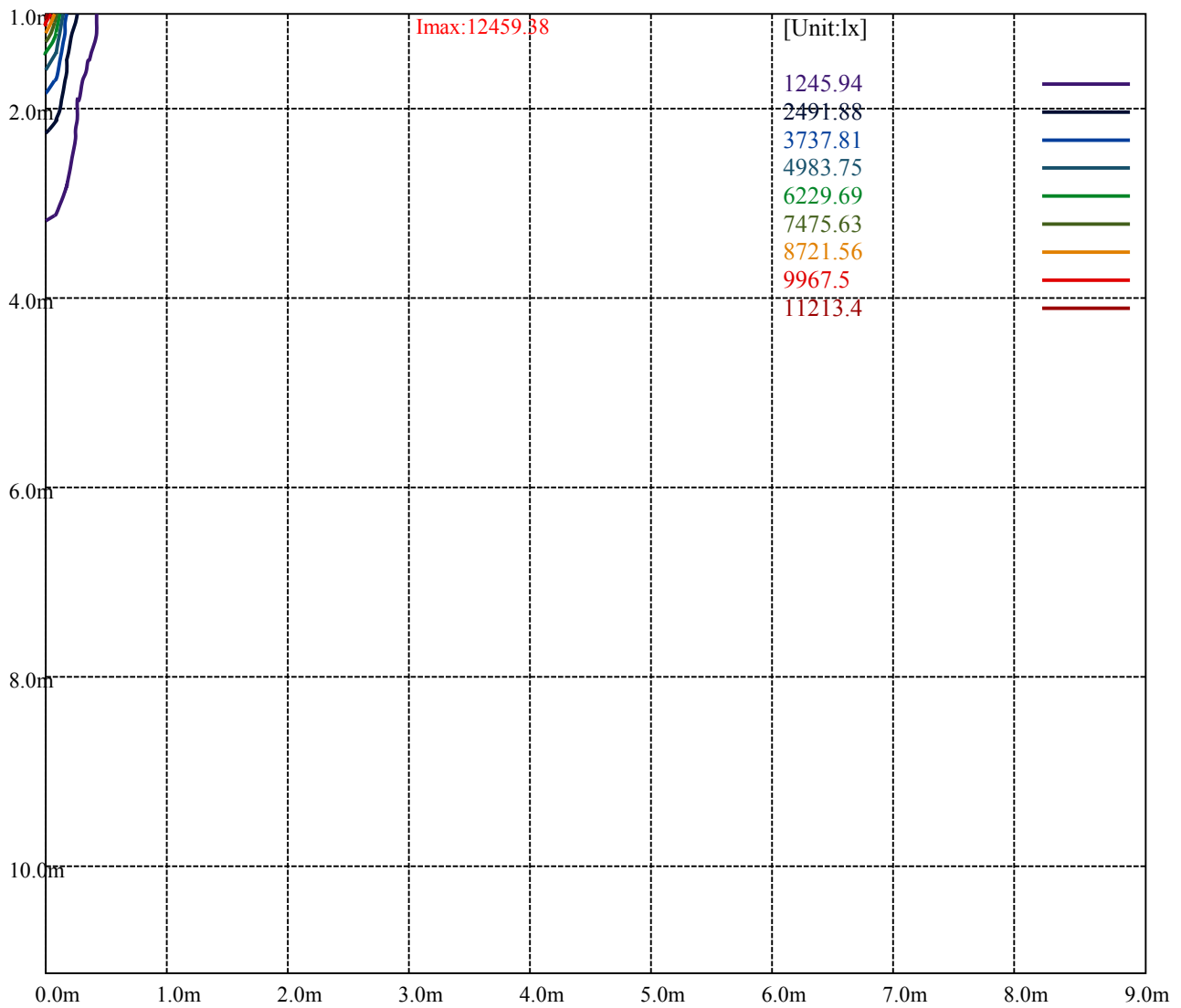
Road

Imax:12459.38

(10%Imax)	1245.94	
(20%Imax)	2491.88	
(30%Imax)	3737.81	
(40%Imax)	4983.75	
(50%Imax)	6229.69	
(60%Imax)	7475.63	
(70%Imax)	8721.56	
(80%Imax)	9967.5	
(90%Imax)	11213.4	



(10%E _{max}) 1245.93	—
(20%E _{max}) 2491.87	—
(30%E _{max}) 3737.8	—
(40%E _{max}) 4983.74	—
(50%E _{max}) 6229.67	—
(60%E _{max}) 7475.61	—
(70%E _{max}) 8721.54	—
(80%E _{max}) 9967.47	—
(90%E _{max}) 11213.4	—



Luminance Table

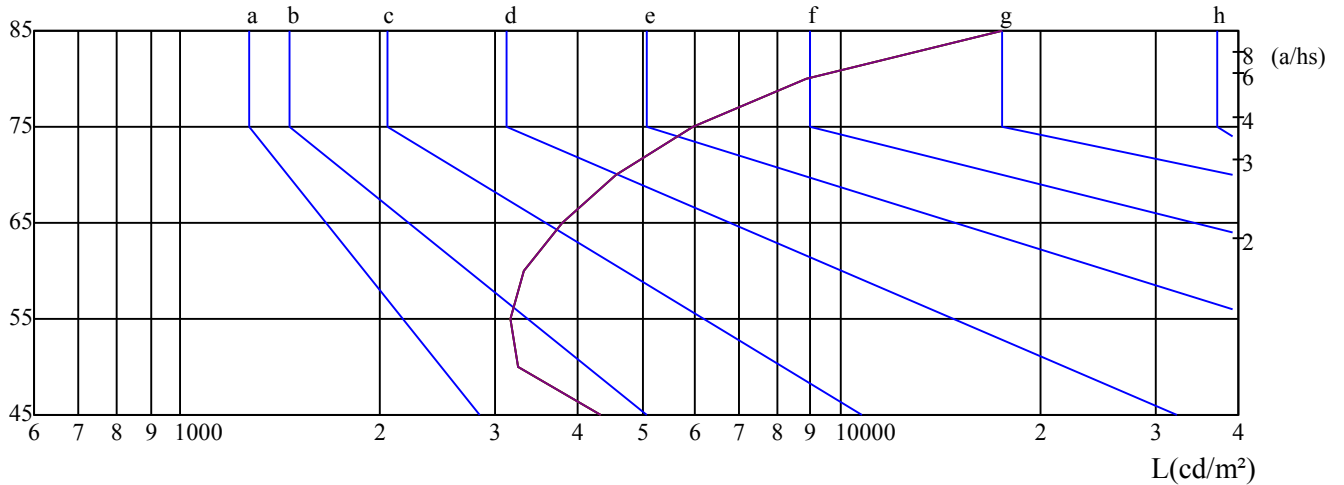
γ	45	50	55	60	65	70	75	80	85
C0	4339	3245	3149	3312	3777	4572	5976	8836	17540
C45	4339	3245	3149	3312	3777	4572	5976	8836	17540
C90	4339	3245	3149	3312	3777	4572	5976	8836	17540

L(Hor)(65)	L(Ver)(65)	L45(65)	L(Hor)(75)	L(Ver)(75)	L45(75)	L(Hor)(85)	L(Ver)(85)	L45(85)
3777	3777	3777	5976	5976	5976	17540	17540	17540

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

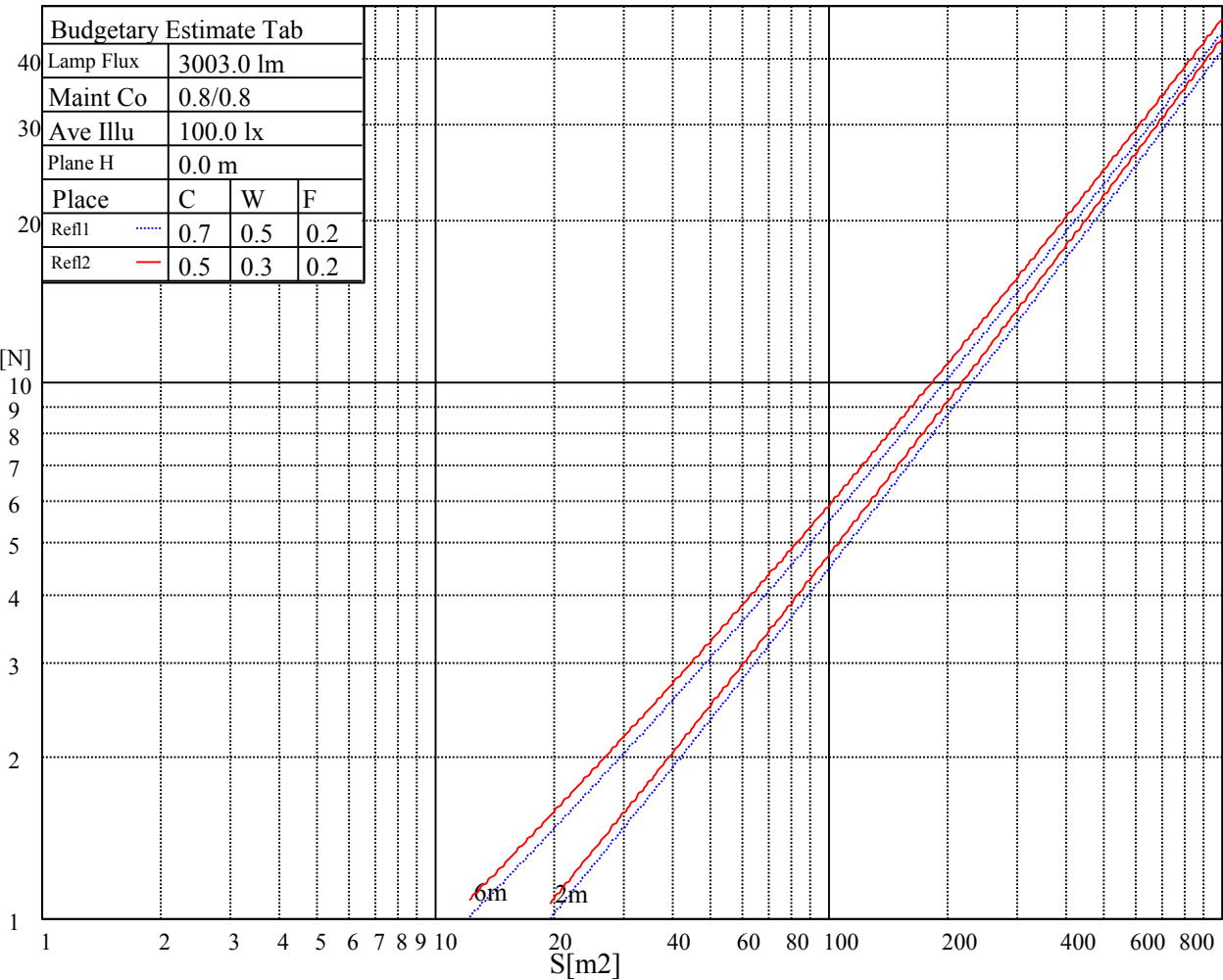
Luminance Limiting Curve

 $\gamma(^{\circ})$ 

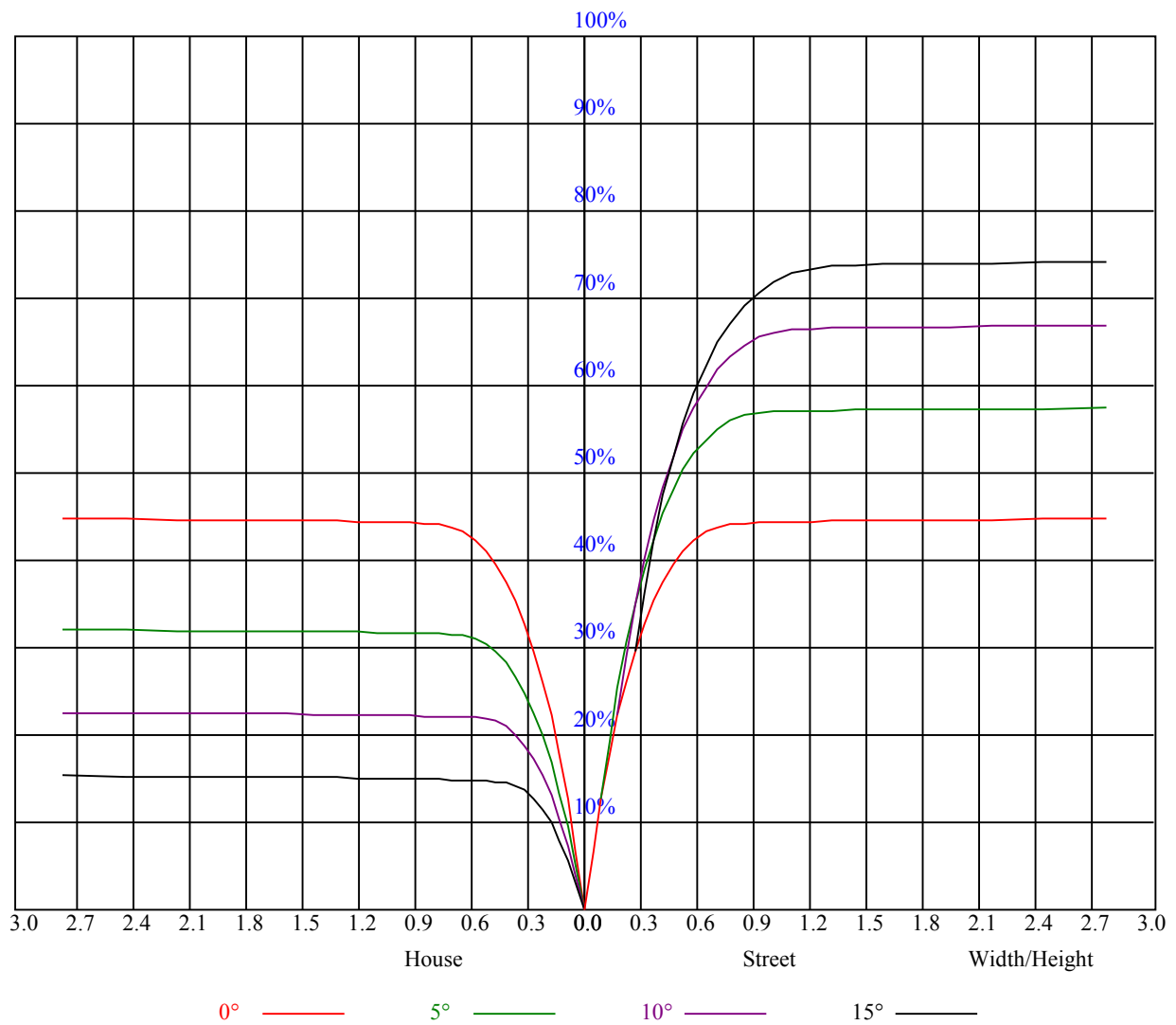
C0 ———

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	1.07	1.07	1.07	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	0.98	0.97	0.99	0.97	0.95	0.95	0.93	0.92	0.92	0.90	0.89	0.89	0.88	0.87	0.85
2	0.95	0.92	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	0.88	0.85	0.82	0.86	0.83	0.81	0.84	0.82	0.80	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	0.73	0.80	0.76	0.73	0.79	0.75	0.72	0.77	0.74	0.72	0.76	0.73	0.71	0.70
6	0.77	0.73	0.70	0.77	0.73	0.69	0.76	0.72	0.69	0.74	0.71	0.69	0.73	0.70	0.68	0.67
7	0.74	0.70	0.66	0.74	0.69	0.66	0.72	0.69	0.66	0.71	0.68	0.66	0.71	0.68	0.65	0.64
8	0.71	0.67	0.63	0.71	0.66	0.63	0.70	0.66	0.63	0.69	0.65	0.63	0.68	0.65	0.63	0.62
9	0.68	0.64	0.61	0.68	0.64	0.61	0.67	0.63	0.61	0.66	0.63	0.60	0.66	0.62	0.60	0.59
10	0.66	0.61	0.58	0.65	0.61	0.58	0.65	0.61	0.58	0.64	0.61	0.58	0.63	0.60	0.58	0.57



NATA 3-1942-M

Intensity data(cd)										Appendix Page: 16 Total:18	
C/γ(°)	0.0	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0		
0.0	12510.00	12566.25	12352.50	11739.38	10783.13	9506.25	7897.50	6761.25	5743.13		
45.0	12515.63	12172.50	11300.63	10136.25	8848.13	7312.50	6187.50	5253.75	4601.25		
90.0	12285.00	11116.69	10551.38	9073.13	7795.13	6489.56	5482.69	4652.44	4136.06		
135.0	12526.88	12127.50	11435.63	10074.38	8797.50	7537.50	6136.88	5236.88	4606.88		
180.0	12510.00	12166.88	11130.19	10448.44	8934.75	7867.13	6584.06	5492.25	4791.38		
225.0	12515.63	12616.88	12487.50	11874.38	11199.94	9867.38	8586.00	7262.44	6078.94		
270.0	12285.00	12622.50	12690.00	12425.63	11840.63	10732.50	9298.13	8026.88	7008.75		
315.0	12526.88	12628.13	12465.00	11176.88	11042.44	9656.44	8331.19	6972.75	5806.13		
360.0	12510.00	12566.25	12352.50	11739.38	10783.13	9506.25	7897.50	6761.25	5743.13		
C/γ(°)	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0		
0.0	4781.25	4286.25	3931.88	3650.63	3431.25	3273.75	3105.00	2970.00	2840.63		
45.0	4061.25	3774.38	3549.38	3352.50	3183.75	3048.75	2908.13	2840.63	2638.13		
90.0	3837.94	3589.31	3393.00	3245.63	3106.13	2943.00	2818.69	2692.69	2549.25		
135.0	4100.63	3830.63	3639.38	3448.13	3268.13	3121.88	2964.38	2840.63	2662.88		
180.0	4321.13	3932.44	3712.50	3526.31	3314.81	3159.00	3006.56	2854.13	2658.38		
225.0	5203.69	4517.44	4082.06	3812.63	3598.31	3362.06	3196.69	3045.38	2883.38		
270.0	5647.50	4905.00	4443.75	3988.13	3706.88	3532.50	3313.13	3133.13	3003.75		
315.0	4992.19	4372.31	3965.06	3703.50	3503.25	3298.50	3150.00	3008.81	2854.69		
360.0	4781.25	4286.25	3931.88	3650.63	3431.25	3273.75	3105.00	2970.00	2840.63		
C/γ(°)	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0	26.0		
0.0	2677.50	2548.69	2408.06	2268.00	2144.25	2019.94	1869.75	1753.31	1642.50		
45.0	2487.38	2356.88	2215.13	2066.06	1936.69	1820.25	1677.38	1567.13	1464.75		
90.0	2404.13	2272.50	2123.44	1972.13	1842.75	1710.00	1599.75	1482.75	1374.75		
135.0	2502.56	2368.69	2216.81	2064.38	1926.56	1794.94	1665.00	1559.25	1460.81		
180.0	2504.81	2356.88	2206.69	2062.69	1936.69	1801.69	1679.63	1564.31	1469.81		
225.0	2726.44	2587.50	2430.56	2284.31	2155.50	2007.56	1877.06	1741.50	1621.69		
270.0	2840.63	2688.19	2527.31	2375.44	2244.38	2099.25	1954.69	1830.94	1720.69		
315.0	2698.88	2570.06	2427.19	2287.69	2158.31	2009.81	1882.13	1748.25	1629.56		
360.0	2677.50	2548.69	2408.06	2268.00	2144.25	2019.94	1869.75	1753.31	1642.50		
C/γ(°)	27.0	28.0	29.0	30.0	31.0	32.0	33.0	34.0	35.0		
0.0	1521.56	1409.63	1320.19	1240.88	1158.19	1097.44	976.50	847.13	690.75		
45.0	1352.81	1269.56	1191.38	1121.63	1032.75	927.00	756.56	608.63	471.38		
90.0	1284.75	1180.69	1103.68	1029.38	913.89	748.41	612.28	476.83	318.77		
135.0	1353.38	1267.88	1187.44	1109.81	1018.69	899.44	738.00	579.38	443.25		
180.0	1382.06	1290.38	1206.56	1121.85	1067.91	920.42	784.97	645.24	468.84		
225.0	1523.25	1434.94	1334.25	1257.75	1170.56	1087.43	989.55	855.51	694.29		
270.0	1594.69	1502.44	1420.31	1330.31	1241.44	1167.75	1087.31	957.38	817.88		
315.0	1531.13	1441.13	1336.50	1257.75	1171.69	1096.54	990.17	853.65	689.29		
360.0	1521.56	1409.63	1320.19	1240.88	1158.19	1097.44	976.50	847.13	690.75		
C/γ(°)	36.0	37.0	38.0	39.0	40.0	41.0	42.0	43.0	44.0		
0.0	550.13	392.06	299.81	152.27	62.38	45.34	38.31	32.46	28.13		
45.0	316.69	298.13	92.42	48.21	41.06	35.83	29.76	25.93	23.06		
90.0	206.33	113.34	47.64	41.34	35.55	29.87	26.55	22.95	20.08		
135.0	295.88	221.85	82.52	44.49	38.19	32.91	28.07	24.24	21.60		
180.0	335.70	218.76	110.14	49.67	41.18	35.21	30.71	26.21	22.61		
225.0	531.62	392.23	250.31	133.65	64.52	44.66	39.99	34.88	30.15		
270.0	651.38	503.44	346.50	284.06	113.34	55.86	42.13	36.84	32.12		
315.0	526.16	388.07	247.78	132.69	63.56	42.30	37.63	32.34	27.73		
360.0	550.13	392.06	299.81	152.27	62.38	45.34	38.31	32.46	28.13		

NATA 3-1942-M

Intensity data(cd)										Appendix Page: 17 Total:18	
C/ γ (°)	45.0	46.0	47.0	48.0	49.0	50.0	51.0	52.0	53.0		
0.0	25.03	21.43	19.80	18.00	16.76	15.86	15.24	14.68	14.23		
45.0	20.14	18.39	17.21	16.20	15.41	14.85	14.34	14.01	13.61		
90.0	18.84	17.04	15.92	15.41	14.96	14.46	14.12	13.78	13.44		
135.0	19.13	17.72	16.76	16.09	15.24	14.79	14.46	14.12	13.73		
180.0	20.31	18.56	17.27	16.37	15.64	14.96	14.51	14.18	13.78		
225.0	26.61	23.63	20.98	19.46	17.72	16.59	15.92	15.41	15.02		
270.0	27.11	23.63	20.93	18.90	17.38	16.37	15.53	14.96	14.51		
315.0	24.36	21.60	19.13	17.55	16.54	15.53	14.91	14.46	14.06		
360.0	25.03	21.43	19.80	18.00	16.76	15.86	15.24	14.68	14.23		
C/ γ (°)	54.0	55.0	56.0	57.0	58.0	59.0	60.0	61.0	62.0		
0.0	13.84	13.44	13.11	12.77	12.49	12.38	12.21	12.09	11.98		
45.0	13.33	13.05	12.66	12.43	12.32	12.21	12.09	11.98	11.93		
90.0	13.16	12.88	12.66	12.49	12.32	12.21	12.09	12.04	11.98		
135.0	13.50	13.05	12.77	12.60	12.49	12.38	12.26	12.15	12.09		
180.0	13.44	13.16	12.88	12.60	12.49	12.32	12.21	12.09	12.04		
225.0	14.51	14.12	13.73	13.16	12.83	12.66	12.49	12.32	12.21		
270.0	14.18	13.78	13.39	13.05	12.71	12.54	12.38	12.26	12.15		
315.0	13.73	13.39	13.05	12.88	12.60	12.38	12.26	12.15	12.04		
360.0	13.84	13.44	13.11	12.77	12.49	12.38	12.21	12.09	11.98		
C/ γ (°)	63.0	64.0	65.0	66.0	67.0	68.0	69.0	70.0	71.0		
0.0	11.93	11.81	11.76	11.76	11.70	11.64	11.64	11.59	11.53		
45.0	11.87	11.76	11.70	11.70	11.59	11.59	11.53	11.48	11.42		
90.0	11.87	11.81	11.76	11.70	11.64	11.59	11.59	11.53	11.48		
135.0	12.04	11.93	11.87	11.87	11.76	11.76	11.70	11.64	11.59		
180.0	11.98	11.87	11.81	11.81	11.76	11.70	11.64	11.59	11.53		
225.0	12.09	11.98	11.87	11.76	11.70	11.64	11.59	11.53	11.48		
270.0	12.04	11.93	11.87	11.81	11.76	11.70	11.70	11.59	11.59		
315.0	11.98	11.93	11.81	11.76	11.70	11.64	11.64	11.59	11.53		
360.0	11.93	11.81	11.76	11.76	11.70	11.64	11.64	11.59	11.53		
C/ γ (°)	72.0	73.0	74.0	75.0	76.0	77.0	78.0	79.0	80.0		
0.0	11.53	11.48	11.48	11.48	11.48	11.48	11.42	11.42	11.42		
45.0	11.42	11.42	11.36	11.36	11.36	11.31	11.31	11.31	11.31		
90.0	11.48	11.48	11.42	11.36	11.42	11.36	11.36	11.31	11.31		
135.0	11.59	11.53	11.53	11.53	11.48	11.48	11.42	11.42	11.36		
180.0	11.53	11.53	11.48	11.48	11.42	11.42	11.42	11.36	11.36		
225.0	11.48	11.42	11.42	11.42	11.36	11.36	11.36	11.31	11.31		
270.0	11.53	11.53	11.48	11.42	11.42	11.42	11.42	11.36	11.36		
315.0	11.53	11.53	11.48	11.48	11.42	11.42	11.42	11.42	11.36		
360.0	11.53	11.48	11.48	11.48	11.48	11.48	11.42	11.42	11.42		
C/ γ (°)	81.0	82.0	83.0	84.0	85.0	86.0	87.0	88.0	89.0		
0.0	11.42	11.42	11.36	11.36	11.36	11.36	11.31	11.31	11.25		
45.0	11.25	11.25	11.25	11.25	11.31	11.25	11.25	11.19	11.19		
90.0	11.31	11.31	11.31	11.25	11.25	11.25	11.25	11.25	11.19		
135.0	11.36	11.36	11.31	11.36	11.31	11.31	11.31	11.31	11.31		
180.0	11.36	11.36	11.31	11.31	11.31	11.31	11.25	11.25	11.25		
225.0	11.31	11.31	11.31	11.31	11.25	11.25	11.25	11.25	11.19		
270.0	11.36	11.36	11.36	11.31	11.31	11.31	11.31	11.31	11.31		
315.0	11.36	11.36	11.36	11.36	11.36	11.31	11.31	11.25	11.31		
360.0	11.42	11.42	11.36	11.36	11.36	11.36	11.31	11.31	11.25		

Intensity data(cd)

Appendix Page: 18 Total:18

C/γ(°)	90.0
0.0	11.25
45.0	11.19
90.0	11.25
135.0	11.25
180.0	11.31
225.0	11.19
270.0	11.25
315.0	11.25
360.0	11.25