中国建筑科学研究院

关于对工程建设国家标准《建筑照明设计标准》征求意见的函

各有关单位及专家：

[illegible]

家，请对该稿内容进行全面、仔细审阅，提出具体的修改意见和建议，按附件二填写，并以信件或电子邮件的形式于 2012 年 10 月 10 日前函告该标准编制组。

编制组联系方式：

[illegible]

Standard for lighting design of buildings

GB 50034　2013

2013　**　**

中国建筑工业出版社

2013

1.
2.
3.
4.
5.

1

1.0.1

1.0.2

1.0.3

2

2.0.1 green lights

2.0.2 visual task

2.0.3 luminous

$$E = \frac{d}{dA} \tag{2.0.6}$$

E lx ,1 lx=1 lm/m^2

2.0.7 maintained average illuminance

2.0.8 reference surface

2.0.9 working plane

2.0.10 luminance contrast

$$C \quad \frac{L}{L_b} \tag{2.0.10}$$

2.0.18 normal lighting

2.0.19 emergency lighting

2.0.20 escape lighting

2.0.21 safety lighting

2.0.22 stand-by lighting

2.0.23 on-duty lighting

2.0.24 security lighting

2.0.25 obstacle lighting

2.0.26 stroboscopic effect

2.0.27 distribution of luminous intensity

2.0.28 luminous efficacy of a source

lm/W

2.0.29 luminaire efficiency

2.0.30 luminaire efficacy

lm/W

2.0.31 uniformity ratio of illuminance

U_0

2.0.32 glare

2.0.33 direct glare

2.0.34 discomfort glare

2.0.35 unified glare rating UGR

CIE

2.0.36 glare rating GR

CIE

2.0.37 glare by reflection

2.0.38 veiling reflection

2.0.39 shielding angle of luminaire

2.0.40 colour rendering

2.0.41 colour rendering index

R

2.0.42 special colour rendering index

CIE

R_i

2.0.43 general colour rendering index

CIE 1974 R_a

2.0.44 colour temperature

T_c K

2.0.45 Correlated colour temperature

T_{cp} K

2.0.46 Color Tolerance Adjustment

SDCM

SDCM

2.0.47 chromaticity

CIE

2.0.48 chromaticity coordinates

X Y Z x y

z

2.0.49 chromaticity diagram

2.0.50 luminous flux maintenance

2.0.51 reflectance

2.0.52 lighting power density LPD

W/m^2

2.0.53 room index

——— 2.0.46

RI

S

l

h

2

53 —

JGJ/T 119-2008

3

3.1

3.1.1

1

2

3

4

1

2

3

4

3.1.2

1

2

1

2

3

3

4

5

1

2

4

5

6

7

1 ≤26mm

2 ≤26mm 26mm

3

4

5

6

7 2011 “ ” 2011 11 1 2012
9 30 2012 10 1 100
2014 10 1 60 2015 10 1 2016
9 30 2016 10 1 15

60W

3.2.3

3.2.4

Ra 80

3.3

3.3.1

	75%	60%

4 3.3.2-4

3.3.2-4 (Ra 80)

	2700K		3000K		4000K	
(lm/W)	55	60	60	65	65	70

5 3.3.2-5

3.3.2-5 (Ra 80)

	2700K			3000K			4000K		
(lm/W)	60	65	70	65	70	75	70	75	80

3.3.4 0

2009 1 1 1 : GB 7000.1-2007

2-22 GB 7000.2-2008 5

1 0

3.3.5

1 IP

2

3

4 IP5X

5

6

7

8

9

1

2

3

4

5

6

7

8

9

3.3.6

IEC598.1-2008

3.3.7

1

2

3 (

). 9 ! GB17625.1

GB17743

4

1

3

4

3.3.8

4

4.1

4.1.1 0.5 1 3 5 10 15 20 30 50 75 100 150 200 300 500 750 1000 1500 2000 3000 5000 lx

CIE S

008/E-2001 1.5

0.5lx

4.1.2

5

4.1.3

1 500mm

2

3

4

5

6

7

8

4.1.4

1

2

3

4.1.5 4.1.5

4.1.5

lx	lx
750 500 300 200	500 300 200
0.5m	

0.5m

4.1.5 CIE

S 008/E-2001

4.1.6

1/3

1/3 CIE 29/2 1986

4.1.7 4.1.6

4.1.6

			/	
			2	0.80
			2	0.70

4.1.6

1 70%

2

1 4 / 2 3 /

3 50

4.1.8 10%

-10% 10%

10 10

4.2

4.2.1 5

NEN-EN 12461-1 2009

4.2.2

1 0.4

2 0.75

3 0.6

4 0.25

CIE

No.83 1989

4.2.3

1 0.5

2 0.7

GAISF

4.3

4.3.1 4.3.1

4.3.1

kcd/m^2	
1 20	10
20 50	15
50 500	20
500	30

CIE S 008/E-2001

4.3.2 UGR

A 5

UGR CIE (S 008/E-2001) UGR 5

A CIE 117 1995

4.3.3 GR B

5.2.12-3

GR GR 5.2.11

GR B CIE 112

1994

4.3.4

1

2

3

4 50lx, 30lx

1

40

2

3

4 LED

4.3.5 65

4.3.5

4.3.5 cd·m^{-2}

	L 200	

EN12464

4.4

4.4.1 4.4.1

4.4.1

		K	
		3300	
		3300 5300	
		5300	

CIE S 008/E-2001

4.4.2 Ra 80

10m Ra 80

5

CIE (S 008/E-2001)

Ra 90 80 60 40 20 CIE

80

10m Ra 80

5

4.4.3 5SDCM

ANSI C78.376

4 SDCM, DOE CFL

7SDCM ANSI C38.377 LED

7 SDCM, LED 7 SDCM

5SDCM

4.4.4

1 4000K

2 CIE 1976

0.007

3 10%

CIE 1976 0.004

1 LED LED

4000K.

2 LED / X,Y CIE 1931

u’v’ CIE 1976 DOE LED

LED CIE 1976 u’v’

0.007

3 LED / DOE LED

LED / 10%

CIE 1976 u’v’ 0.004

4.5

4.5.1 4.5.1

4.5.1

	0.6 0.9
	0.5 0.8
	0.2 0.4
	0.2 0.6

CIE S

008/E-2001

5

5.1

5.1.1 5.1.1

5.1.1

			lx	R_a
		0.75m	100	80
			300*	
		0.75m	75	80
			150*	
		0.75m	150	80
		0.75m	100	80
			150*	
		0.75m	100	80
			75	60
			30	60
			20	60
			30	60
*				

GB50034-2004

CIE S 008/E-2001

5.2

5.2.1 5.2.1

5.2.1

		lx	UGR	U_0	R_a
	0.75m	300	19	0.60	80

	0.75m	500	19	0.60	80
	0.75m	300	19	0.60	80
	0.75m	500	19	0.70	80
	0.75m	500	19	0.60	80
	0.75m	300	19	0.60	80
	0.75m	300	19	0.60	80
	0.25m	50		0.40	80
( )	0.75m	500	19	0.60	80

GB50034-2004

CIE S

008/E-2001

5.2.2 5.2.2

5.2.2

		lx	*UGR*	U_0	R_a
	0.75m	300	19	0.60	80
	0.75m	500	19	0.60	80
	0.75m	300	19	0.60	80
*	0.75m	500	19	0.60	80
	0.75m	200		0.40	80
	0.75m	300	22	0.40	80
		500	19	0.60	80
	0.75m	300		0.40	80
	0.75m	200		0.40	80
1 * 300lx 2					

GB50034-2004

5.2.3 5.2.3

5.2.3

		lx	*UGR*	U_0	R_a
	0.75m	300	22	0.60	80
	0.75m	500	22	0.60	80
	0.75m	300	22	0.60	80
	0.75m	500	22	0.60	80
	0.75m	300	22	0.60	80
	0.75m	300*	22	0.60	80
	0.75m	200	22	0.60	80
		500**		0.60	80
* **					

GB50034-2004

CIE

S 008/E-2001

5.2.4 5.2.4

5.2.4

			lx	*UGR*	U_0	R_a
			200	22	0.40	80
		0.75m	100	22	0.40	80
		0.75m	150	22	0.40	80
			150	22	0.40	80
			200	22	0.40	80

			300	22	0.60	80
		0.75m	150	22	0.60	80
		1.1m	500			80

GB50034-2004

5.2.5 5.2.5

5.2.5

			lx	*UGR*	U_0	R_a
		0.75m	75		0.40	80
		0.75m	150			80
			300		0.70	80
		0.75m	150		0.40	80
		0.75m	200	22	0.60	80
		0.75m	150		0.60	80
		0.75m	75		0.40	80
		0.75m	300	22	0.60	80
		0.75m	300	19	0.60	80
			200		0.40	80
			300*			80
			200	22	0.40	80
			50		0.40	80
			300		0.70	80
			200	22	0.60	80
		0.75m	200	22	0.60	80
		0.75m	200		0.40	80
*						

CIE S 008/E-2001

5.2.6 5.2.6

5.2.6 80

		lx	*UGR*	U_0	R_a
	0.75m	300	19	0.70	80
	0.75m	500	19	0.70	80
	0.75m	750	19	0.60	90
	0.75m	300	19	0.60	80
	0.75m	200	22	0.40	80
		100	19	0.60	80
	0.75m	300		0.60	80

ÓÞ51KM P D 125>BDC 167.38 r 493.38 48.4601 ref57469080

5.2.8

1 5.2.8-1

2 5.2.8-2

3 5.2.8-3

5.2.8-4 5.2.8-4 5.2.8-5

5.2.8-1

		lx	*UGR*	U_0	R_a
	0.75m	300	22	0.60	80
	0.75m	150	22	0.40	80
	0.75m	300	19	0.60	80
		200	22	0.40	80
		100	19	0.60	80
		150	19	0.60	80
		150	22	0.60	80
	0.75m	500	19	0.70	90
1. 2. 5.2.8-3					

5.2.8-2

		lx	*UGR*	U_0	R_a
	0.75m	300	19	0.60	80
	0.75m	300	22	0.60	80
	0.75m	300	22	0.60	80
		300	22	0.60	80
		200	22	0.40	80
3D 4D		100	19	0.40	80
		200	22	0.60	80
		200	22	0.60	80

CIE

S 008/E-2001

5.2.9 5.2.9

5.2.9

lx UGR U_0 R

			300		0.60	80
		0.75m	300	19	0.60	80
			200	22	0.40	80
			150		0.40	80
			75		0.60	20
			50		0.40	20
			75		0.60	80
			150		0.60	80
			50		0.60	80
			100		0.60	80
			100	25	0.60	80
			200	22	0.60	80
			150	25	0.60	80
			200	22	0.60	80

GB50034-2004

JGJ 243-2011

5.2.11 5.2.11

					U_0	

CIE S 008/E-2001

5.2.12

1 5.2.12-1

2 5.2.12-2

3 5.2.11-3

5.2.12-1

				lx	
				300	750
				300/200 (/)	750/500 (/)
				300	500
				200	750
				500	750
				500	1000
				500	2000
				750	1000
				300	750
				500	750
				300	1500
				300	750
				300	500
				1000	1500
				300	500
		120m			300
		160m			500
		200m			750
					100
				200	

5.2.12-2

		lx
		m

		25	75	150
A	1.0 m	500	750	1000
B	1.0 m	750	1000	1500
C	1.0 m	1000	1500	
0.25				

5.2.12-3

GB50034-2004

5.3

5.3.1 5.3.1

5.3.1

			lx	*UGR*	U_0	R_a	
1							
		0.75m	200	22	0.40	60	
	0.1mm	0.75m	300	22	0.60	60	
	0.1mm	0.75m	500	19	0.70	60	
		0.75m	200	25	0.60	80	
		0.75m	300	25	0.60	80	
		0.75m	500	22	0.70	80	

		0.75m	750	19	0.70	80	
		0.75m	300	25	0.60	60	
		0.75m	300	25	0.60	80	
		0.75m	500	22	0.70	80	
		0.75m	750	19	0.70	80	
		0.75m	300	25	0.60	80	
		0.75m	200		0.60	60	
		0.75m	300		0.70	60	
		0.75m	300		0.60	60	
		0.75m	300		0.60	60	
		0.5m	200		0.60	20	
		0.5m	200		0.60	20	
		0.5m	300	25	0.60	60	
		0.5m	500	25	0.60	60	
		0.5m	200		0.60	20	
		0.75m	300		0.60	80	
		0.75m	300		0.60	80	
		0.75m	500	22	0.70	80	
		0.75m	300		0.60	80	
		0.75m	300	22	0.60	80	
		0.75m	500	22	0.70	80	
		0.75m	500	22	0.60	80	
		0.75m	200		0.60	60	
		0.75m	300	22	0.70	60	
		0.75m	300	22	0.60	80	
		0.75m	300	22	0.60	80	
		0.75m	500	19	0.70	80	

		0.75m	500	19	0.70	80	
		0.75m	500	19	0.70	80	
		0.75m	300	19	0.60	80	
		0.75m	500	19	0.60	80	
		0.75m	300	22	0.60	80	
		0.75m	300	22	0.60	80	
		0.75m	300		0.60	80	
		0.75m	300	22	0.70	80	
		0.75m	150	22	0.60	80	
		0.75m	200	22	0.60	80	
		0.75m	300	22	0.60	80	
		0.75m	300	22	0.60	80	
		0.75m	300	22	0.70	80	
		0.75m	300	22	0.70	60	
		0.75m	100		0.60	80	
		0.75m	150	22	0.60	80	
		0.75m	200	22	0.60	60	
		0.75m	75		0.60	60	
		0.75m	100	25	0.60	60	
		0.75m	150	25	0.60	60	
		0.75m	150	25	0.70	80	
		0.75m	200	22	0.70	60	
		0.75m	100	22	0.60	60	
4							

		0.75m	300	22	0.60	80	
			200		0.40	80	
			200		0.40	80	
			100		0.40	40	
5							
		0.75m	300		0.60	80	
		0.75m	300		0.60	80	
		0.75m	300	22	0.60	80	
		0.75m	300		0.60	80	
6							
			100		0.60	40	
			200		0.60	60	
		0.75m	500	19	0.60	80	
7							
			30		0.60	40	
			100		0.60	40	
			50		0.60	40	
			150		0.60	40	
			150		0.60	60	
			200	25	0.60	40	
			150		0.60	40	
			150		0.60	40	
			150		0.60	40	

			150		0.60	20	
			50		0.60	40	
		0.75m	150		0.60	80	
		0.75m	200	22	0.70	80	
8							
		0.75m	150		0.60	60	
		0.75m	200		0.60	60	
		0.75m	200		0.60	60	
		0.75m	300		0.60	60	
		0.75m	300	25	0.60	60	
		0.75m	500	22	0.60	60	
		0.75m	200		0.60	40	
9							
		0.75m	200	22	0.60	80	
		0.75m	300	22	0.60	80	
		0.75m	300	22	0.60	80	
		0.75m	200		0.60	80	
		0.75m	150		0.60	80	
		0.75m	150	25	0.60	80	
10							
		0.75m	150		0.60	60	
			100		0.60	20	
11							
			100		0.60	20	
			75		0.60	40	

		30		0.40	20	
	0.75m	300		0.60	60	
12						
	0.75m	200		0.60	60	
	0.75m	200	22	0.60	60	
		100		0.60	20	
13						
	0.75m	200		0.60	80	
	0.75m	300		0.70	80	
	0.75m	300	22	0.60	80	
	0.75m	500	22	0.70	80	
	0.75m	200		0.60	80	
	1.0m	100		0.60	60	
	1.0m	100		0.60	60	
14						
		100		0.60	20	
		75		0.70	60	
		30		0.60	20	
		75		0.60	20	
		30		0.60	20	
	0.75m	100		0.40	40	
	0.75m	150		0.40	60	
15						
	0.75m	200	22	0.60	60	
	0.75m	500	19	0.70	80	

		0.75m	300	25	0.60	60	
		0.75m	300	22	0.60	60	
		0.75m	750	22	0.70	60	
		0.75m	300	25	0.60	60	
		0.75m	750	22	0.70	80	

1.0 3.0

GB50034-2004

5.4

5.4.1 5.4.1

5.4.1

			lx	*UGR*	U_0	R_a	
			100		0.40	60	
			200		0.60	60	
			50		0.40	60	
			100		0.60	60	
			30		0.40	60	
			75		0.60	60	
			150		0.60	60	
			100		0.40	60	
			150		0.60	80	
			100		0.40	60	
			150		0.60	80	

		0.75m	750	19	0.60	80	
		0.75m	500	19	0.70	80	
		0.75m	500	19	0.60	80	
		0.75m	500	19	0.60	80	
		0.75m	200		0.60	80	
			100		0.60	60	
			200	25	0.60	80	
			200	25	0.60	80	
		0.75m	300	22	0.60	80	
		0.75m	500	19	0.60	80	
			100		0.60	60	
			100		0.60	60	
			150		0.60	60	
			150		0.60	60	
			100		0.60	60	50lx

5.4. 4

1 2lx

2 5lx

3 40 1

4

5lx

1.5m

GB

*****

6

6.1

6.

1	GB17896-1999	
2	GB19043-2003	
3	GB19044-2003	
4	GB19415-2003	
5	GB19573-2004	
6	GB19574-2004	
7	GB20053-2006	
8	GB20054-2006	

6.2.2

——

6.2.3

28W

1200mm

600mm T8 18W T5 14W

28 45W 14 18W

6.2.4

6.2.5 0.9

6.2.6 25W 3

33%

GB17625.1——2003 C 25W

≤25W 3 86%

3 33%

6.2.7

1

2

3

4

10% 30%

6.2.8

6.2.9

6.2.10

“ ”

6.3

6.3.1 6.3.1

6.3.1

	W/m^2		lx
	6	5	100
			75
			150
			100
			100
	4.0	3.0	30 50

6.3.2 6.3.2

6.3.2

	W/m^2	lx	

	9.0	8.0	300	1.50
	15.0	13.5	500	
	9.0	8.0	300	
	15.0	13.5	500	
	11.0	10.0	300	

6.3.3 6.3.3

6.3.3

	W/m²		lx	
	10.0	9.0	300	2.00
*	16.0	14.5	500	2.00
	11.0	10.0	300	1.50
	17.0	15.5	500	2.00
	11.0	10.0	300	2.00
	11.0	10.0	300	1.00
	10.0	8.0	200	1.50
5W				

6.3.4 6.3.4

6.3.4

	W/m²		lx	
	7.0	6.0	—	—
	10.0	8.0	200	1.00
	6.0	5.0	150	—
	15.0	13.5	300	1.00
	4.0	3.0	50	—

	11.0	9.0	300	1.50
	9.0	8.0	300	1.50
5W				

6.3.5 6.3.5

6.3.5

	W/m^2		lx	
	9.0	8.0	300	1.50
	15.0	13.5	500	1.50
	6.0	5.5	200	1.00
	5.0	4.5	100	1.50
	17.0	15.0	500	2.00
	9.0	8.0	300	1.50

6.3.6 6.3.6

6.1.6

	W/m^2		lx	
*	9.0	8.0	300	1.50
	9.0	8.0	300	
	15.0	13.5	500	
	9.0	8.0	300	
	15.0	13.5	500	
	6.5	5.5	150	

6.3.7

1 6.3.7-1

2 6.3.7-2

3 6.3.7-3

6.3.7-1

	W/m²		lx	
	9.0	8.0	300	1.50
	9.0	8.0	300	1.50
	9.0	8.0	200	1.00
	5.0	4.5	100	1.00
	6.5	5.5	150	1.00

6.3.7-2

	W/m²		lx	
	9.0	8.0	300	1.50
	9.0	8.0	300	1.50
	9.0	8.0	300	1.50
	10.0	8.0	300	1.50
	9.0	8.0	200	1.00
	5.0	4.5	100	1.00

6.3.7-3

	W/m²		lx	
	15.0	13.5	300	1.00
	9.0	8.0	300	1.50
	9.0	8.0	300	1.50
	4.5	4.0	75	1.00

	6.5	5.5	150	1.00

6.3.8 6.3.8

6.3.8

	W/m²		lx	
	9.0	8.0	300	1.50
	15.0	13.5	300	1.00
	15.0	13.5	300	1.00
	9.0	8.0	200	1.00
	15.0	13.5	300	1.00

6.3.9 6.3.9

6.3.9

		W/m²		lx	
		6.5	5.5	150	1.50
		9.0	8.0	200	
		10.0	9.0	200	1.00
		9.0	8.0	200	1.00
		7.0	6.0	75	—
		5.0	4.5	100	1.00
		9.0	8.0	200	
		6.5	5.5	150	1.00
		9.0	8.0	200	

6.3.10 6.3.10

6.3.10

	W/m²	lx	

	9.0	8.0	200	1.00
	9.0	8.0	300	1.50

		18.0	16.0	500	1.50
		8.0	7.0	200	1.50
		13	12	300	1.50
		15	14	300	1.50
		25	23	500	1.50
		15	14	300	1.50
		12.0	11.0	300	1.50
		19.0	17.0	500	1.50
		18.0	16.0	500	1.50
		7.5	6.5	200	1.50
		11.0	10.0	300	1.50
2.					
		11.0	9.5	300	1.50
		11.0	9.5	300	1.50
		19.0	17.0	500	1.00
		19.0	17.0	500	1.00
		19.0	17.0	500	1.00
		11.0	9.5	300	1.00
		19.0	17.0	500	1.00
		11.0	9.5	300	1.00
		11.0	9.5	300	1.50
		14	12	300	1.50

6.3.12 6.3.12

6.3.12

		W/m^2		lx	
		9.5	8.0	300	1.50

		16.0	14.0	500	
		9.5	8.0	300	
		24.0	21.0	750	
		16.0	14.0	500	
		7.0	6.0	200	1.00
		4.0	3.0	100	0.80
		7.0	6.0	200	1.00
		9.5	8.0	300	
		16.0	14.0	500	1.50
		16.0	14.0	500	
		16.0	14.0	500	1.50
		4.0	3.5	100	
		4.0	3.5	100	
		6.0	5.0	150	0.80
		6.0	5.0	150	
		5.0	4.5	100	
		2.5	2.0	50	—
		5.4	3.5	100	—
		6.0	5.0	150	—
		7.0	6.0	200	—
		4.0	3.0	50	—
		5.0	4.5	100	—

6.3.13

6.3.13

6.3.13

	0.8	1	1.5	2

RI 0.8	1.21	1.40	1.71	1.86
0.8≤RI 1	1.00	1.16	1.41	1.53
1≤RI 1.5	0.87	1.00	1.22	1.33
1.5≤RI 2	0.71	0.82	1.00	1.09
RI 2	0.65	0.75	0.92	1.00

4 3 2.75

≤ *RI*

6.3.2 300lx 1.5

9W/ *RI*=0.86 6.3.13 1.41

LPD

LPD LPD 9 1.41 12.69W/m^2

6.3.14 **4.1.3 4.1.4**

4.1.3 4.1.4

6.3.15 **50%**

50% LPD

100m^2 2000W

800W 1200W 50%

LPD LPD

$$LPD \quad \frac{1200 \quad 800 \quad 50\%}{100} \quad 16W/m^2$$

6.4

6.4.1 GB 50033

GB 50033

6.4.2

6.4.3

6.4.4

7

7.1

7.1.1 220V 1500W

380V

220V ; 1500W

220V 380V 380V

,

7.1.2

3

7.2.2

1

2

3

4

EPS UPS

7.2.3

7.2.2 1 3

7.2.4

10%

GB 13499/T-2002 IEC60076-8

1997

7.2.5 16A

25 25A 60

25A

7.2.6

7.2.7

7.2.8

0.9

0.4 0.5

250W HID

0.85

GB/T15042-2008

IEC60293-2006

7.2.9

1

2

7.2.10 PE

GB7000.1-2007

7.2.11

SELV

50V

7.2.12 1.5mm^2

7.2.13

3 33%

GB50054

3

3

7.2.14

7.3

7.3.1

7.3.2

7.3.3

7.3.4

7.3.5 2

6

7.3.6

1

2

3

4

1 2

3

4

7.3.7

1

2

3

4

7.3.8

1

2

3

4

5

8

8.1

8.1.1

8.1.2

1

2

3

4

8.1.3

8.2

8.2.1

8.2.2

8.2.3

8.2.4

8.2.1 8.2.4

A UGR

A.0.1 UGR

1 UGR A.0.1

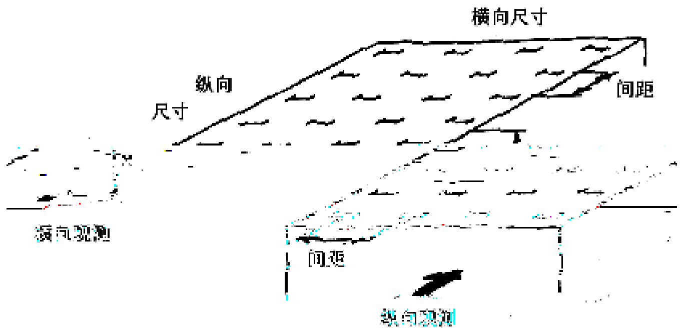
$$UGR \quad 8\lg\frac{0.25}{L_b} \quad \frac{L^{\ 2}}{P^2} \qquad \text{A.0. 1}$$

L_b cd/m^2

L cd/m^2

sr

p



A.0.1

x = x =

y = y =

2 A.0.1

1 L_b A.0.1-1

$$L_b \quad \frac{E_i}{} \qquad \text{A.0.1-1}$$

E_i lx

2 L A.0.1-2

$$L \quad \frac{I}{A \ \cos} \qquad \text{A.0.1-2}$$

I cd

$A \quad cos$ m^2

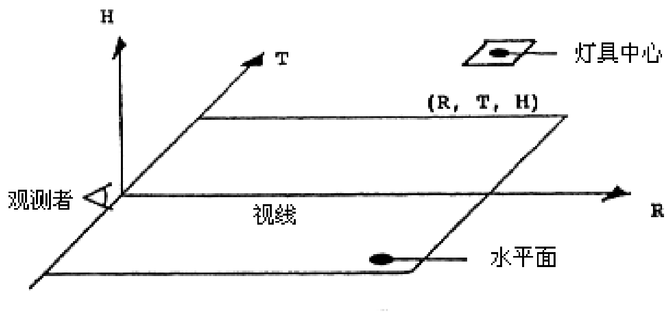
3 A.0.1-3

$$\frac{A_p}{r^2} \quad \text{A.0.1-3}$$

A_p m^2

r m

4 P A.0.1-2 H/R T/R A.0.2



A.0.1-2 R T H H/R T/R

A.0.2

H/R T/R	0.00	0.10	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00	1.10	1.20	1.30	1.40	1.50	1.60	1.70	1.80	1.90
0.00	1.00	1.26	1.53	1.90	2.35	2.86														
0.10	1.05	1.22	1.45	1.80	2.20	2.75														
0.20	1.12	1.30	1.50	1.80	2.20	2.66														
0.30	1.22	1.38	1.60	1.87	2.25															
0.40	1.32	1.47	1.70	1.96	2.35															

2.50	4.00	4.50	4.95	5.40	5.85	6.40.	6.95	7.55	8.25	8.85	9.50	10.05	10.85	11.55	12.30	13.00	13.80	14.50	15.25	15.00
2.60	4.07	4.55	5.05	5.47	5.95	6.45	7.00	7.65	8.35	8.95	9.55	10.10	10.90	11.60	12.32	13.00	13.80	14.50	15.25	16.00
2.70	4.10	4.60	5.10	5.53	6.00	6.50	7.05	7.70	8.40	9.00	9.60	10.16	10.92	11.63	12.35	13.00	13.80	14.50	15.25	16.00
2.80	4.15	4.62	5.15	5.56	6.05	6.55	7.08	7.73	8.45	9.05	9.65	10.20	10.95	11.65	12.35	13.00	13.80	14.50	15.25	15.00
2.90	4.20	4.65	5.17	5.60	6.07	6.57	7.12	7.75	8.50	9.10	9.70	10.23	10.95	11.65	12.35	13.00	13.80	14.50	15.25	16.00
3.00	4.22	4.67	5.20	5.65	6.12	6.60	7.15	7.80	8.55	9.12	9.70	10.23	10.95	11.65	12.35	13.00	13.80	14.50	15.25	16.00

A.0.2 UGR

1 UGR

2

1

GB50057

4 GB50054