

LED 路燈照明量測報告書

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prove that the **WANSTAR TECHNOLOGY CO.,LTD** a lighting Association in North America (IES), with four meters wide roadway (lights erected three meters high) and six-meter-wide (five meters high erected street lamps) roadway illumination average (unit: Lux)

Regional Classification	Mixed Zone	Residential areas
Illumination	7	4

Lamps high	Right under the illumination of street lamps	Vertical distribution of light	Side-Distribution	Average illumination (LUX)
3 meters	70 LUX	10 meters	4 meters	13.1363 LUX
3.5 meters	55 LUX	10 meters	4.8 meters	12.4216 LUX
4 meters	48 LUX	12 meters	4.8 meters	9.92971 LUX
4.5 meters	33 LUX	12 meters	5.6 meters	8.524194 LUX
5 meters	27 LUX	14 meters	6.4 meters	8.245455 LUX
5.5 meters	24 LUX	16 meters	7.2 meters	6.666667 LUX

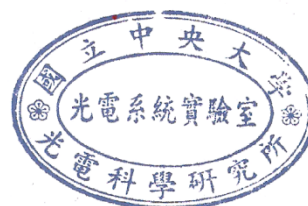
Vertical distribution of Light: Lamps exposure to the largest center brightness illumination on the road at the edge of a LUX 2 times the distance

Side-distribution: 50% of a maximum brightness of the scope covered by the trajectory LED lights 24 hours a day open for 14500 hours, its voltage (19.8 V), current (2.11 A) power (41.8 W), is 30 centimeters below the illumination (1483 LUX), showing stability does not change recession.

Its detailed test report Annex, LED lights lighting Measurement Report

Detection officers : Shang Hsuan Lin , Shu Ping Liu

Test report : 2009/05/20



The purpose of road lighting

The purpose of road lighting in the tunnel at night or rapid changes in places such as brightness settings lighting equipment to enable road users to have good visual environment, to be able to take full advantage of road and traffic conditions, to achieve the purposes of traffic safety and smooth.

The definition of the term

1. Beam (ψ) (unit: lumens (Lumen))

1 lumen of light from the point to a candle light radiation equal to a brightness meters of equidistance square meters within a hemisphere of the amount of light.

2. Brightness (I) (unit: candlelight cd or cp)

From the point source in a solid angle of the beam is fired out of the class, then the brightness of the light source for a candlelight vigil.

3. Illuminance (E) (unit: lux (Lux))

Unit area by the beam irradiation of a few. 1 m^2 received by the smooth lumens of light called a lux.

4. Luminance (L) (unit: Nit= cd/m^2)

Or by the light reflective surface of the observation point in the direction of the unit area or reflection on the brightness values.

Road lighting standards

The most frequently cited general road lighting of the standard is based on the North American foreign Lighting Association (IES) and the International Commission on Illumination (CIE) standards, such as details of Annex 1, to borrow the North American Lighting Association (IES) standards, and domestic use following specifications:

- A. "streetlight design requirements" - the Ministry of Economic Affairs (1986)
- B. "Traffic Engineering Handbook" - Chapter VII of the road lighting Traffic (1980)
- C. urban road project planning and design specifications of the study - chapter 19 of the urban road construction Department of the Ministry of the Interior Lighting Design (2002)

(1) Illumination standards

Table 1 Average roadway illumination (unit: lux (Lux))

Regional Classification	Commercial	Mixed Zone	Residential areas
Illumination	9		4

(Data from the IES and road lighting standard reference design differences CIE)

(2) Lamp brightness distribution

(A) Bare: its greatest brightness cover the range of 0 degrees to 65 degrees.

(Data from the Department of the Ministry of the Interior construction "of urban road project planning and design specifications Study" (2002) compilation)

The type and use of lamps

The type and use of lights should be consistent with the provisions of Table 2.

Table 2 types of lamps

Categories road	Allow the glare of	Lighting patterns	
		Priority	Fair
Trunk	A little	Shelter	Semi-obscure
Other roads	Allowing	Shelter or Semi-obscure	Bare

(Refer to the Ministry of Economic Affairs "streetlight design requirements" (1986) and the Department of the Ministry of the Interior construction "of urban road project planning and design specifications Study" (2002) compilation)

(3) the arrangement of lighting selection principle

Street lighting facilities are usually way, the right width W Table Road (meters), S Table installation interval (meters).

(A) unilateral arrangement, as shown in Figure 1.

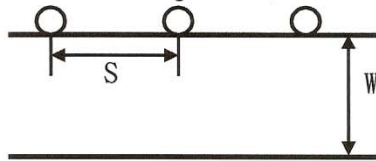


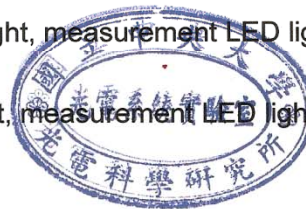
Figure 1 unilateral arrangement

LED lights lighting measurement steps

1. Measurement locations: find an open its surrounding areas no other source (such as street lamps)

Measuring Time: 9:00 p.m., at this time environmental background (Moonlight) illumination of 0.3 lux ,LED lights will be set up in 3 meters height, measurement LED lights below the distribution of illumination.

2. LED lights will be erected at 3.5 m height, measurement LED lights below the distribution of illumination.
3. LED lights will be set up in 4 meters height, measurement LED lights below the distribution of illumination.
4. LED lights will be set up in 4.5 meters height, measurement LED lights below the distribution of illumination.
5. LED lights will be set up in 5 meters height, measurement LED lights below the distribution of illumination.



6. LED lights will be set up in 5.5 meters height, measurement LED lights below the distribution of illumination.

7. Measurement LED lights lamp voltage and current for 10 hours illumination changes.

LED lights Measurement Results

LED lights as time and measure voltage and current measurement

	Voltage (V)	Current (A)	Power (W)	Is 30 centimeters below the illuminance (LUX)
0 Hour	19.9V	2.04A	40.6W	1497 LUX
24Hours	19.9V	2.11A	41.9 W	1496 LUX
48Hours	19.9V	2.11A	41.9 W	1498 LUX
72Hours	19.9V	2.11A	41.9 W	1495 LUX
96Hours	19.9V	2.11A	41.9 W	1490 LUX
120Hours	19.9V	2.11A	41.9 W	1490 LUX
1200Hours	19.9V	2.11A	41.9 W	1490 LUX
1800Hours	19.9V	2.11A	41.9 W	1490 LUX
2400Hours	19.9V	2.11A	41.9 W	1490 LUX
2880Hours	19.8V	2.11A	41.8 W	1490 LUX
3600Hours	19.8V	2.11A	41.8 W	1490 LUX
3700Hours	19.8V	2.11A	41.8 W	1490 LUX
3768Hours	19.8V	2.11A	41.8 W	1490 LUX
10000Hours	19.8V	2.11A	41.8 W	1483 LUX
14500Hours	19.8V	2.11A	41.8 W	1483 LUX

LED lights 24 hours a day open for 14500 hours, its voltage (19.8 V), current (2.11 A) power (4.18 W) is 30 centimeters below the illumination (1483 LUX), showing stability does not change recession.

