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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 35626-2017

**Specification for the limitation of obtrusive light from outdoor
lighting**

室外照明干扰光限制规范

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1 Scope

China's national specification for limiting obtrusive light from outdoor lighting. It specifies the division of urban environments by ambient brightness, the classification of obtrusive light, the limitation requirements and the restrictive measures. Obtrusive light is the light that goes where it was not wanted: upward into the sky, sideways into bedroom windows, or straight into the eyes of a driver. Each is a different problem with a different limit. Sky glow is a regional effect and is why the stars are invisible over a city. Light trespass is a local nuisance, and it is the one that generates complaints. Glare is a safety matter. The environmental zoning is what makes the limits workable: the same luminaire that is unacceptable beside a rural observatory is reasonable in a city centre, so the standard divides territory into brightness zones and sets limits per zone. The measures are mostly geometric - shielding, aiming, cut-off optics - because light that never leaves the fitting in the wrong direction needs no further control.

This Standard specifies urban environment brightness division, obtrusive light classification and the limitation requirements and measures of obtrusive light related to obtrusive light of outdoor lighting. This Standard is applicable to limitation requirements for obtrusive light of urban roads, residential buildings, outdoor public activity areas and natural ecological areas, etc.

2 Normative References

The following documents are indispensable to the application of this document. In terms of references with a specified date, only versions with a specified date are applicable to this document. In terms of references without a specified date, the latest version (including all

the modifications) is applicable to this document.

GB/T 2900.65 Electrotechnical Terminology - Lighting CJJ

45 Standard for Lighting Design of Urban Road JGJ/T 163 Code for Lighting Design of Urban Nightscape

3 Terms and Definitions

What is defined in GB/T 2900.65, and the following terms and definitions are applicable to this Standard.

3.1 Spill Light Spill light refers to the light shining outside the scope of the illuminated target.

3.2 Obtrusive Light Obtrusive light refers to the light that causes people's annoyance, discomfort, distraction or reduced ability to view important information (for example, traffic signals) due to its quantity or direction characteristics.

3.3 Light Pollution Light pollution is a general term for the sum of various adverse effects of artificial light.

c) Light pollution to the night sky: the light of lighting device directly shines into or is reflected into the night sky, affecting astronomical observation;

d) Obtrusive light to motor vehicle road traffic: various non-road lighting devices around the road cause glare effects on motor vehicle drivers, resulting in a decrease in their visibility;

e) Obtrusive light that affects public activity areas (such as: urban squares and pedestrian streets, etc.), natural ecological areas and animal habitat areas.

4.2.3 In accordance with the source of the obtrusive light, it may be divided into the following categories:

a) Obtrusive light generated by advertisements, signs or display screens: the surrounding environment and people's lives are affected due to inappropriate brightness, colors, flickers and excessive overflow light of advertisements, sign lighting or display screens;

b) Obtrusive light generated by landscape lighting: the surrounding environment and people's lives are affected due to inappropriate brightness, colors, flickers and excessive overflow light of landscape lighting;

c) Obtrusive light formed by the overflow light of functional lightings, such as: road lighting and outdoor worksite lighting, etc.

5.1 Limitation of Obtrusive Light in Residential Areas

5.1.1 The limitation of obtrusive light in residential areas shall be evaluated through the vertical illuminance limit on the outer surface of the windows of residential buildings and the luminous intensity limit of the luminaire facing the windows of the living rooms.

5.1.2 The vertical illuminance limit of the outer surface of the windows of residential buildings shall not exceed the stipulations of Table 2.

5.5 Limitation of Obtrusive Light to Urban Public Rest Areas, Natural Ecological Areas and Animal Habitat Areas

5.5.1 Lighting fixtures installed on the waterside of urban rivers and lakes shall prevent the direct light and reflected light from the water surface from affecting road users and surrounding residential buildings.

5.5.2 The limitation of obtrusive light of urban park road lighting fixtures to pedestrians should comply with the stipulations of 5.2; the lighting of public activity areas shall not affect the environment beyond the areas.

5.5.3 In urban forest parks, in addition to safety precaution lighting and pedestrian walkway lighting, other lightings shall not be installed; lighting facilities shall be prevented from illuminating surrounding trees; luminaires with an upward luminous flux of 0 shall be used.

5.5.4 Landscape lighting should not be set up in nature reserves.

5.5.5 The lighting of plants shall comply with the following requirements:

- a) Landscape lighting shall not be installed on rare trees; landscape lighting facilities installed around them shall not affect rare and ancient trees;
- b) Normal landscape lighting should not be installed for ordinary trees;
- c) Lighting fixtures should not be installed on trees; lighting fixtures installed around trees shall not affect the growth of the branches, leaves and roots of the trees.

5.5.6 Landscape lighting should not be installed in animal habitat areas and related protection areas. When setting up lighting in places where animals or insects might show up, light sources that have a series impact on animals and insects shall not be used.

5.6 Limitation of Obtrusive Light of Advertisements and Sign Lighting

5.6.1 The limitation of obtrusive light of advertisements and sign lighting shall be evaluated through the average brightness limit of the light-emitting surface of advertisements and signs.

5.6.2 The maximum allowable average brightness of the light-emitting surface of advertisements and signs shall not exceed the stipulations of Table 6.

6 Restrictive Measures

6.1 The lighting design shall be based on the area and the characteristics of the illuminated object, and the demands for lighting. In addition, it shall comply with the requirements of relevant national and industry standards.

6.2 During the design of outdoor lighting, analysis and evaluation of the influence of obtrusive light shall be conducted on potentially obtruded objects.

6.3 The dynamic pattern, frequency of change, color parameters, spectral power distribution and intensity of landscape lighting shall be coordinated with the environment. Except for the commercial areas, and culture and entertainment areas, dynamic lighting facilities that frequently change patterns should not be set up.

6.4 During the design of landscape lighting for building facades with mixed reflection characteristics, when the specular reflection component of the wall reflectance exceeds 50%, the mode of flood lighting should not be adopted.

6.5 The limitation of obtrusive light of urban squares or pedestrian street lighting shall comply with the requirements of relevant stipulations in JGJ/T 163.

6.6 When the mode of flood lighting is used for landscape lighting, the spill light shined beyond the illuminated area shall comply with the requirements of relevant clauses in JGJ/T 163.

6.7 The spill light of urban outdoor worksite lighting shall not be greater than 15%.

7 Test Methods

7.1 The obtrusive light in the residential area shall be measured through the vertical illuminance limit on the outer surface of the windows of the living rooms of residential buildings and the luminous intensity limit of the luminaire (after being installed in place) facing the windows of the living rooms.

7.2 The obtrusive light of the sidewalk shall be measured through the maximum average brightness between the 85° and 90° directions of the luminaire and the downward perpendicular, and the total light-emitting area of the luminaire between the 85° and 90° directions from the downward perpendicular.

7.3 The light pollution of the night sky shall be measured through the upward light output ratio of the luminaire. The upward light output ratio of the luminaire is obtained by measuring the luminous flux of the luminaire shined above the horizontal plane with the position of the luminaire in on-site installation and usage.