



Section 103

Street Lighting

This section establishes the uniform policies and procedures for the preparation of the street lighting requirements in the City of Irvine.

It is not intended as a textbook, or substitute for engineering knowledge, experience, or judgment but rather as a guideline to uniformity and to provide the designer with sufficient information for the preparation of desired plans with a minimum amount of uncertainty.

Please refer to the latest posted amendment for any updates or modifications to the standards herein.



Public Works

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Public Works

Section 103 *Street Lighting*

103.1 GENERAL

The purpose of these standards is to promote the application of adequate, uniform illumination of streets and highways throughout the City of Irvine.

Reference for additional information regarding actual design and application techniques of lighting systems is in accordance with the American National Standards Institute Practice for Roadway Lighting, (RP-8) 1983 and the Orange County Traffic Engineer's Council Street Lighting Policy dated 1-24-74.

Street light locations and bulb intensity shall be submitted to the City Engineer for approval on all public and private streets. Once approved by the City Engineer, the approved plans shall be submitted to the Southern California Edison Company for implementing design and locations of street lights.

All new or retrofitted lighting systems shall utilize high pressure sodium vapor (HPSV) or Light-Emitting Diode (LED) lamps with cut-off luminaires.

The use of other light sources will require prior approval from the City Engineer.

103.2 DESIGN CRITERIA

A. Classification

1. Commercial

The portion of a municipality in a business development where ordinarily there are large numbers of pedestrians and a heavy demand for parking space during periods of peak traffic, or a sustained high pedestrian volume and a continuously heavy demand for off-street parking space during business hours. The definition applies to densely developed business areas outside of, as well as those that are within, the central part of a municipality.

2. Intermediate

The portion of a municipality which is outside of a downtown area but generally within the zone of influence of a business or industrial development, characterized often by a moderately heavy nighttime pedestrian traffic and somewhat lower parking turnover than is found in a commercial area. This definition includes densely developed apartment areas, hospitals, public libraries, and neighborhood recreational centers.

3. Residential

A residential development or a mixture of residential and commercial establishments, characterized by few pedestrians and a low-parking demand or turnover at night. This definition includes areas with single family homes, townhouses, and/or small apartments. Regional parks, cemeteries, and vacant lands are also included.

B. Uniformity

1. The illumination values in the Table of Horizontal Foot-Candles (see below) are minimum and provide effective visibility only when combined with uniformity, or relatively even illumination spread on the pavement and sidewalks.
2. The average level to minimum point method shall be used. With this method the average illumination of the roadway design area between two adjacent luminaires is divided by the lowest value at any point in the area. The average to minimum ratio should not exceed three to one for any roadway in the Table, except local roadways which shall be a ratio not to exceed six to one.

3. A specified luminaire and lamp provides a distinct light distribution and hence its uniformity. The normal position is to have the luminaire level. These factors must all be considered in relation to the spacing-to-mounting height ratio.
4. Photometric data for system design purposes shall be of the actual type of luminaire and lamp (or the equivalent) to ensure illumination uniformity.

C. Levels of Illumination

1. Street and pathway lighting shall be designed in accordance with the following criteria for each project area:

TABLE OF HORIZONTAL FOOT-CANDLES						
<u>Recommended Average Horizontal Foot-Candles</u>						
	Roadway Classification				Sidewalks	
	Major	Primary Secondary	Commuter Local	Alleys	Within Public Street ROW	Parks, Skywalks
Commercial	2.0	1.2	0.9	0.6	0.9	2.0
Intermediate	1.4	0.9	0.6	0.4	0.6	1.0
Residential	1.0	0.6	0.4	0.2	0.2	0.5

2. The values in the Table are for roadway sections which are approximately straight and nearly level. Intersecting, converging or diverging roadway areas require higher illumination. The illumination within these areas shall at least be equal to the sum of the values recommended for each roadway which forms the intersection. They also include very high volume driveway connections to public streets and mid-block pedestrian crosswalks.
3. Situations involving traffic conflict areas are treated in detail as part of Appendix A of ANSI D17.1-1972.
4. Maintain a minimum distance of 20 feet between luminaires and trees.
5. Light loss factor shall be 70%.

D. Electrolier Arrangement and Spacing

1. It is generally more economical to use larger lamps at reasonable spacing and mounting heights than smaller lamps at more frequent intervals with lower mounting heights.

2. Maintain a minimum distance of 20 feet between luminaires and trees.
3. The layout of electroliers should start at the intersection of the streets involved.
4. At intersections, electroliers shall be placed at or near the B.C.R. at the far right of the dominant approach.
5. Spacing and heights of poles at hillside locations shall be investigated to prevent obstruction of view from view lots.
6. Electroliers in median islands shall not be placed closer than 100 feet from arterial highway or collector street intersection. Electroliers shall not be placed in median islands less than 6 feet in width.
7. The following are the minimum quantity of electroliers to be installed and the minimum bulb intensity. Additional electroliers may be required depending on lamp size and pattern used.

Location (Intersection)	Minimum Number of Electroliers	
Two Residential Streets	1 (one)	
Residential T	1 (one) at nearest T-intersection pedestrian crossing or head of T-intersection	
Cul-de-Sac	1 (one) at beginning of Cul-de-Sac widening on Lot Line	
Knuckle/ Street Bend	Beginning and end on outside of Knuckle/Bend	
Residential T at Arterial	2 (on Arterial)	
Arterial with Residential	2 (on Arterial)	
Two Arterials	4	
<u>Street Types</u>	<u>Maximum Spacing</u>	<u>Lumens/Watts</u> ¹
Local, Collector	150 feet	5,800/70W
Arterial with medians	150 feet w/ double mast arm in median	9,500/100W
Arterial w/o medians	180 feet staggered side to side	22,000/200W
Street widths <100 feet (no medians)	180 feet staggered side to side	16,000/150W
Super Streets (8 lanes)	300 feet with double mast arms in medians and 300 feet both sides of street; 150 feet from either median lights or parkway lights. 8 ft. medians – 6 ft. mast arms; 10 ft. medians – 8 ft. mast arms; Over 10 foot medians- place poles 18 in. from curb face on both sides of median.	27,500/250W

¹ When LED lighting is used, the equivalent Lumens/Watts shall be used.

E. Mounting Heights/Mast Arms

1. Minimum mounting height for local streets is 25 feet and for arterial highways is 30 feet.
2. Electroliers may be set behind the sidewalk; in no case shall the luminaire (for side of street installation) be less than two feet over the pavement.

Wattage ¹	Height (feet)	Mast Arm Length
50 HPS	25	4' ² , 6' ³
70 HPS	25	4' ² , 6' ³
100 HPS	25, 30	4' ² , 6' ³
150 HPS	30	6' ² , 8' ³
200 HPS	30	6' ² , 8' ³
250 HPS	30, 35	6' ² , 8' ³

- ¹ When LED lighting is used, the equivalent Lumens/Watts shall be used.
- ² Street light pole in accordance with example II of Standard Plan 218.
- ³ Street light pole behind sidewalk in accordance with example I of Standard Plan 218.