



City of Rohnert Park

Street Lighting Design Standards

**STREET LIGHTING DESIGN STANDARDS
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Volume 1

Design Standards

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STREET LIGHTING DESIGN STANDARDS

GENERAL

The purpose of the standards and specifications contained herein is to establish uniform standards for street lights on public streets in the City of Rohnert Park, installed after the date of adoption of these standards. This document is not intended or designed as, nor does it establish, a legal standard for lighting.

- A. These Street Lighting Standards shall be used for all street lights on public streets in the City of Rohnert Park.
- B. These standards shall apply as of the date of adoption and are not considered retroactive.
- C. Deviations from these standards shall require specific approval of the City Engineer.
- D. These standards do not preclude the use of a higher standard.
- E. Encroachment onto any City street, right-of-way, or public utility easement shall require an encroachment permit issued by the City of Rohnert Park.
- F. Street light spacing shall be staggered and located at property lines when possible. Street light designs utilizing one side, median, or opposite configurations shall require specific approval of the City Engineer.
- G. Electrical service shall conform to the requirements of Standard Plans 603A and 603B.
- H. The City Engineer shall designate specific connection points for connecting new street lights into the existing multiple street light system. The City shall only authorize energization after City acceptance of the installation.
- I. The developer shall verify available capacity when proposing to connect to an existing multiple street light system.
- J. The following additional requirements apply to street light systems installed by private developers:
 - 1. The developer shall make arrangements with PG&E for service points. Service points shall be shown on the improvement plans. The developer shall be responsible for all costs associated therewith which shall be paid directly to PG&E. The contractor shall verify the street light service point location(s) with PG&E prior to installation. The City will authorize and request energization from PG&E.

2. The developer shall install the following in accordance with the Street Lighting Standard Plans: concrete foundations, galvanized steel poles, mast arms of the appropriate lengths, and wiring.
3. The developer shall install the entire lighting system, including luminaire.
4. All street light systems utilizing street light lamps up to, and including, 150 watts shall be designed for 120 volt service unless connecting to an existing system. In the latter case, the design shall conform to the system being connected to and must be specifically approved by the City Engineer. Street light systems utilizing street light lamps above 150 watts shall require 240 volt service.

DEFINITIONS

“Average Maintained Footcandles” is the average level of horizontal illuminance on the roadway pavement when the output of the lamp and luminaire is diminished by the maintenance factors; expressed in average footcandles for the pavement area.

“California Standard Plans” shall mean the latest edition of the Standard Plans adopted by the California Department of Transportation.

“California Standard Specifications” shall mean the latest edition of the Standard Specifications adopted by the California Department of Transportation.

“Candela” is the luminous intensity. Formerly the term “candle” was used.

“City Engineer” for the purposes of the Streetlight Standards, shall mean the City Engineer of the City of Rohnert Park.

“City Traffic Engineer” (See definition in the Traffic Standards).

“Collector Street” Major Collector or Minor Collector

“Cul-de-sac street” shall have the primary purpose of serving abutting land use and connecting to the nearest appropriate local street. It is a minor street with only one outlet.

“Electrolier” is the complete street light assembly consisting of street light pole, luminaire, ballast, and lamp.

“Footcandle” is the illuminance on a surface one-square-foot in area on which there is uniformly distributed a light flux of one lumen.

“Industrial street” shall be public and private streets located within industrial areas as defined on the current City zoning map, or roadways that primarily serve large trucks transiting to and from retail centers.

“Illuminance” is the density of the luminous flux incident on a surface; it is the quotient of the luminous flux divided by the area of the surface when the latter is uniformly illuminated.

“Lateral Light Distribution” is a pattern of light distributed upon a series of longitudinal and transverse roadway lines, based on the location of the luminaire as related to the area to be lighted.

“Local street” means a street that provides access to individual sites. Local streets include Minor Streets, Neighborhood Streets, Lanes, Alleys, Utility Access Roads, Trails, Loop Streets and Cul-de-sac Streets. On-street parking is required on Minor Streets and Neighborhood Streets.

“Luminaire” is a complete lighting unit consisting of a lamp or lamps together with the parts designed to distribute the light, to position and protect the lamps and to connect the lamps to the power supply.

“Major arterial” means a street whose primary purpose is to facilitate movement of heavy traffic between major residential areas, or major residential areas and commercial areas with minimal access. Major arterial streets may consist of 2, 4, or 6 lanes. Intersections with local streets are permitted, provided they are right-turn-only and at least 200 feet apart, or they include a left-turn pocket. Driveways are generally not permitted. Driveways are permitted to major traffic generators, provide they are right-turn-only. A deceleration lane must be provided for each driveway. *Major traffic generators include areas designated for Regional Commercial, Office, Mixed Use, and High Density Residential uses.* No on-street parking is allowed. Major arterial streets include Parkways.

“Major collector” means to provide circulation within and between neighborhoods. Driveways are permitted, provided they are right-turn-only and at least 50 feet apart, or they include a left-turn pocket. No on-street parking is allowed. Major collector includes Boulevards.

“Minor arterial” means to provide circulation between neighborhoods, activity centers, and highways and other regional routes, and also to provide circulation in rural and open space areas. Intersections with local streets are permitted, provided they are right-turn-only and at least 200 feet apart, or they include a left-turn pocket. *This provision is intended to maximize access between neighborhoods.* Driveways are permitted, provided they are right-turn-only and at least 100 feet apart. A deceleration lane must be provided for each driveway. No on-street parking is allowed. Minor arterial streets include Parkways.

“Minor collector” means to provide circulation within and between neighborhoods. Minor collector streets shall have the primary purpose of intercepting traffic from intersecting local streets and handling traffic to the nearest arterial/regional street, or intercepting traffic from one collector street and handling traffic to another collector street. It shall serve as an access to abutting properties. Minor collector streets connect residential neighborhoods to commercial centers and service commercial districts. On-street parking is required on both sides of each segment of a one-way couplet. Minor collector streets include Avenues, Main Streets, and Industrial Streets.

“**Minor Street**” shall have the primary purpose of serving abutting land use and handling traffic to the nearest collector street.

“**Street Lighting Standard Plan**” shall mean a typical standard detail of the Street Lighting Standards and Details of the City of Rohnert Park.

“**Uniformity Ratio**” is the ratio of average footcandles of illuminance on the pavement area to the footcandles at the point of minimum illuminance on the pavement.

ASTM	American Society for Testing and Materials
FC	Footcandle
IES	Illuminating Engineering Society of North America
NEC	National Electric Code
NEMA	National Electrical Manufacturer’s Association
PG&E	Pacific Gas and Electric Company
PVC	Polyvinyl Chloride
UL	Underwriter’s Laboratories, Inc.
U/R	Uniformity Ratio

1. Roadway Illumination Requirements

- A. Design Conformity
 - 1. The design of all street light systems shall conform to the average maintained footcandle and uniformity ratio requirements of these specifications.

- B. Area Classifications
 - 1. Area classifications shall be used when determining the required illuminance levels for street lighting systems. The area classification selected for designing the street light system shall be determined by the City Engineer:
 - a. “Commercial” shall mean that portion of the City 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. This definition applies to densely developed business areas.

- b. “Intermediate” shall mean that portion of the City which is within the zone of influence of a business or industrial development, often characterized by a moderately heavy nighttime pedestrian traffic and a 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.
- c. “Residential” shall mean 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.

C. Average Maintained Footcandle Requirements

- 1. The design of all street lighting systems shall conform to these illumination requirements. Evidence that demonstrates that the street lighting system conforms to these requirements shall be submitted to the City with the proposed design.
- 2. The below-listed chart shall be used for determining the average maintained footcandle (Avg. Maint. FC) and Uniformity Ratio (U/R) requirements for the specific roadway and area types:

Roadway Classification	Area Classification	Avg. Maint. FC	U/R
Arterial	Commercial	.75	3:1
	Intermediate	.75	3:1
	Residential	.75	3:1
Collector	Commercial	.30	5:1
	Intermediate	.30	5:1
	Residential	.30	5:1
Minor	Intermediate	.20	4:1
	Residential	.20	4:1

D. Lateral Light Distribution

1. Lateral light distribution patterns shall conform to Illuminating Engineering Society of North America (I.E.S.) lateral light distribution patterns shown in Street Lighting Standard Plan 604
 - a. Type II lights shall be used on local roadways.
 - b. Type III lights shall be used on major arterials and major collectors.
 - c. Type IV lights shall be used at the terminus of cul-de-sacs.
2. Luminaires shall be full cutoff on all local roads and in all residential areas. Luminaires shall be cutoff or full cutoff in all other areas.
3. Design shall conform to these requirements except as specifically approved by the City Engineer.

2. Street Lights

A. Cobra Style Streetlights

1. The luminaire shall be LED, produced by a manufacturer approved by the City of Los Angeles Bureau of Street Lighting. Color temperature shall be between 4000K and 4700K unless otherwise approved by the City Engineer. The luminaire shall have a minimum 5-year unconditional warranty on both the fixture and the bulb.
2. It is recommended that designers use the lowest wattage LED fixture that meets lighting criteria.
3. Street light poles and mast arms shall be galvanized steel.
4. The street light poles shall be an Ameron Series PL, Landmark Lighting S3508, Pacific Union Metal LA 10120 or an approved equal.
5. Street light pole heights shall conform to the applicable standard plan. Alternate pole heights shall require specific approval of the City Engineer by variance.
6. Street light mast arm lengths shall conform to the applicable standard plan. Alternate mast arm lengths shall require specific approval of the City Engineer by variance.
7. The concrete footing requirements shall conform to the requirements of Street Lighting Standard Plan 620A.
8. The base leveling requirements shall conform to the requirements of Street Lighting Standard Plan 621.
9. The wiring for the electrolier shall conform to the requirements of Street Lighting Standard Plan 602.

B. Decorative Street Light (Residential Streets)

1. Decorative street lighting in residential areas is generally discouraged due to glare and light spillage onto residential property. Decorative lighting in

residential areas must be specifically approved by the City Engineer and Planning Director.

2. If decorative street lighting is to be installed, luminaire shields shall be required, unless waived by the City Engineer and Planning Director.

C. Decorative Street Light (City Center Area)

1. Street lights installed within the current boundaries of the City center area shall conform to the requirements of Street Lighting Standard Plan 618.
2. Alternate street light installations shall require the specific approval of the City Engineer and Planning Director by variance.
3. Each luminaire shall have installed an individual photocell control.
4. Base and concrete footing details shall conform to the requirements of Street Lighting Standard Plan 620B. The base leveling requirements shall conform to Street Lighting Standard Plan 621.
5. At the discretion of the City Engineer, luminaire shields may be required.

3. Wiring

- A. Except as noted, all wiring methods and equipment construction shall conform to the National Electric Code (NEC) and applicable sections of the California Standard Specifications.
- B. All splices shall be made with solderless and waterproof connectors.
- C. Unless authorized otherwise, all wiring shall be THW A.W.G. stranded, copper only. Unless otherwise specified on the Street Lighting Standard Plans, all wiring shall be of the following sizes:
 1. All field wiring: #8 minimum (NEC)
 2. Pullbox to electrolier: #10 minimum (NEC)
 3. All wire in pole: #10 minimum (NEC)

4. Photocells

- A. All street lights shall be equipped with photoelectric control. The photocell shall be Type IV consisting of a photoelectric unit which plugs into an EEI-NEMA twist lock receptacle integral with the luminaire and shall conform to the provisions of the California Standard Specifications. The photoelectric controls shall be operable within a minimum voltage range between 105 and 280 volts. All photoelectric controls shall be oriented to the north.

5. Conduit

- A. All conduit to be used shall be a minimum of 2-inch diameter, schedule 40 PVC, except from each street light to the adjacent pull box which shall be 1-1/2-inch

diameter galvanized steel. All conduits shall have a 2-foot minimum cover from the top of conduit to the finished grade of the sidewalk, parkway, or roadway.

- B. All steel conduit and other metal parts, including bonding bushing, shall be NEC-approved parts and shall be continuously bonded and grounded per NEC requirements.
- C. All bends and/or offsets shall be made with factory sections using approved couplers per NEC requirements.
- D. All empty conduits shall have a one-quarter-inch polypropylene pull rope provided inside and sealed with a duct seal, approved by the City Engineer, on both ends of the conduit.
- E. The ends of all conduits installed shall be sealed with a duct seal approved by the City Engineer. Conduits stubbed for future extension shall be capped.

6. Pullboxes

- A. Unless specifically approved by the City Engineer by special request, a No. 5 concrete pull box (California State Standard ES-8) shall be installed within five feet of the base of all street light poles.
- B. All pull boxes shall be installed per Street Lighting Standard Plan 601.
- C. Pull boxes shall not be more than 250 feet apart on long runs.
- D. Pull boxes shall not be placed where they will be subject to vehicular traffic. Exceptions shall require specific written approval of the City Engineer.
- E. All pull box covers shall be inscribed with “Street Lighting” and be secured with 3/8-inch bolts, cap screws, or studs and nuts that meet the provisions of the California Standard Specifications.
- F. Poles shall be stenciled with “RP (Pole No.) W (Wattage)” with 2-inch black numbers at 8 feet above the ground to designate the assigned pole number and wattage. Numbers shall be on the street side of the pole.