

SECTION 5
STREET LIGHTING

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SECTION 5 STREET LIGHTING

5-1 STREET LIGHTS REQUIRED

Streetlights shall be provided on all public streets. Streetlights may be required adjacent to parcels containing structures which are being improved or altered, depending on the nature and extent of the work. Illustrations of streetlights generally required are shown on Standard Drawing 5-1 and 5-2.

5-2 STREET LIGHTS ON PRIVATE ROADWAYS

Streetlights may be required on private roadways serving more than 4 residences or serving a commercial use, as determined by the County Engineer. For planned developments, residential, commercial, and industrial developments where the internal streets are private, a private street lighting system will be required for the internal non-dedicated streets, in addition to public street lighting provided by the Developer on the external public street frontage.

5-3 DEVELOPER'S RESPONSIBILITY

Existing streetlights which must be relocated or repositioned as a result of the construction of new streets or driveways into a development shall be the responsibility of the Developer.

A new service can with a step-down transformer, required as a result of the modification, replacement or relocation of an existing utility service pedestal shall be the responsibility of the Developer.

It shall be the responsibility of the Developer to ensure that the existing street light system remains operational until the new street light system to replace it is completed and functioning correctly.

The Developer shall coordinate with electric utility for planning, design, preparation of plans, financing (pay all fees and costs) and operation, as required to install new streetlights. The Developer shall submit joint trench utility plans to the County showing the installation of streetlights.

All streetlights will be publicly owned (by County or Community Service District) and maintained by the electric utility via standard LS-series rate charges. Any existing private streetlight to be relocated as part of the project shall be converted to a publicly owned light. In certain limited cases, the lights may be owned and maintained by the electric utility, as directed by the County Engineer.

5-4 UTILITY COMPANY AUTHORIZATION

A written notice from the serving utility company, stating that line clearance and service have been checked and that the street lighting design meets utility standards and will be served by the utility, shall be submitted to the County Engineer for all developments.

5-5 GENERAL PLAN DETAILS

The plans shall show and identify all street lights to be installed, all existing lights in the immediate vicinity of the project, all conduit and conductor runs, service points, trees, and all applicable provisions and details specified in these standards.

On subdivision projects, a separate plan sheet shall be included for the street lighting system. This plan sheet may be combined with a signage plan. In addition, joint trench composite plans shall be submitted. Street lights (exclusive of other required information) shall also be shown on street plan and profile sheets. In addition to the above, the following shall be required on the street light portion of subdivision plans, even though duplications may be involved:

- All details of street light construction.
- A signature block conforming to Standard Drawing 3-2.
- Utility lines and public utility easements.
- Names of adjacent subdivisions.
- Intersecting property lines of adjacent properties.
- Legend indicating electrical symbols.
- A North arrow and appropriate scale. (1" = 10' to 1" = 100')
- All existing street lights on both sides of any streets.
- All new tree installations shall be more than 10' from street lights.
- All trees within the vicinity of the conduit runs or proposed streetlights.
- Street lights shall be located at least 15 feet away from any fire hydrant.

5-6 DESIGN STANDARDS

- A. Street lighting shall be designed in conformance with the "American National Standard Practice for Roadway Lighting" of the American National Standards Institute (ANSI/IESNA RP-8). The following table may be used as guidance for small projects, as determined by the County Engineer.

TABLE 5-1 STREET LIGHTING GUIDE

Street Classification	Width (Feet at Face of Curb)	Typical Pole Height (Feet)	High Pressure Sodium Lamp (Watts)	Distribution Type	Typical Spacing¹ (Feet)	Maintained Illuminance (Ft. Candles)
Local Residential, Local Residential Low-Volume, Primary Residential	32-40	25	70	II mid-block III intersections	200-250	.47
Collector	40-64	30	100	III	200-250	.87
Industrial	48-64	30	100	III	200-250	.41
Arterial (2-lane)	54	30	100	III	150-200 ²	1.07
Arterial (4-lane)	78	30	150	III	150-175 ²	1.11
Bike Path	10	15	70	II	115 ³	.17
Open Space	-	14 to 20	70	III, IV or V	Note 4	.17
Note 1: Standard "Cobra" style with 8' mast arm. Post top style requires review of illuminance based layout.						
Note 2: Lights mounted back to back on single pole in median.						
Note 3: Standard post top style along bike paths.						
Note 4: Calculations to be performed by the lighting designer.						

- B.** Data and calculations indicating compliance shall be submitted for review, when required by the County Engineer. The electrical system shall be designed for 120 volts single phase. In special circumstances, the design voltage may be increased to 240 volts. Voltages higher than 240 will not be allowed. Electronic copies of light photometric distribution patterns shall be provided for any non-standard lights.
- C.** Lumens used to calculate the Average Illuminance shall be based on 80% of the manufacturer's value for the lamp. The luminaire depreciation factor (dirt accumulation) shall be 60%.
- D.** Lamps other than High Pressure Sodium are not allowed.
- E.** Light Spacing may be adjusted $\pm 10\%$ to allow for driveways and other physical obstacles.
- F.** Open space design criteria shall be reviewed and approved by the County Engineer on a case by case basis.
- G.** Provide luminosity plan.
- H.** Provide shields on house-side of luminaire.

5-7 STREET LIGHT DESIGN DETAILS

- A. Intersections: Intersections shall have at least one streetlight. Intersection street light locations and the number required shall conform to Standard Drawings 5-3 and 5-4.
- B. Cul-de-sacs: All cul-de-sacs exceeding 130 feet in length, measured from the street light location at the intersection to the right-of-way line at the end of the cul-de-sac, shall have a street light within the bulb. The location of the streetlight within the bulb shall conform to Standard Drawing 5-4.
- C. Bike Paths: Streetlights shall be placed as indicated in the Street Lighting Guide table, and at both ends.
- D. Spacing: The maximum street light spacing, measured along the street centerline, shall conform to the above table. Streetlights on arterial streets shall be staggered. Double median poles will be considered on a case-by-case basis and require special approval.
- E. Street Light Poles: All street light poles shall be of galvanized steel, aluminum or concrete, as required to match nearby facilities. Poles shall be identified on the plans or in the special provisions. Identification information shall include material type, bolt circle diameter, luminaire mounting height, pole dimensions and length of mast arm.

The County Engineer may approve special or unusual designs if warranted by the character of the surrounding neighborhood. Where special or unusual design street light poles are not listed in the Caltrans Standard Specifications, the Developer shall supply additional poles to the County for future pole replacement. The minimum number of replacement poles to be supplied to the County shall be 10% of the poles being installed with any fractional percent rounded up to the next whole number.

The position of the street light poles relative to sidewalk shall conform to Standard Drawing 5-5.

- F. Street Lights on Existing Utility-Owned Poles: When there are permanent existing utility owned poles with existing streetlights adjacent to the project, the existing streetlights shall be replaced with publicly owned streetlights in accordance with these standards. The Developer shall make all arrangements with the owning utility for disconnection and removal of existing pole mounted streetlights.
- G. Luminaires and Ballasts:
 - 1. Luminaires shall be high-pressure sodium type with internal ballasts. The type of street light and the appropriate wattage shall be specified on the plans. All luminaires shall conform to the standards outlined in the Caltrans Standard Specifications; light distribution shall be ANSI type II or III per these design standards and shall be full cut-off type unless specified otherwise by the County Engineer. The light pattern for each luminaire shall be specified on the plans.
 - 2. Ballasts shall conform to the standards outlined in the Caltrans Standard Specifications, except that for 70 and 100-watt high-pressure sodium luminaires the ballast shall be energy efficient.
- H. Service: All street light systems shall have underground service provided. Service points shall be provided within a utility easement immediately adjacent to or within the right-of-way and shall be open and easily accessible to the street frontage. Types of service are as follows:
 - 1. A direct underground service consists of one light being served from a single service point. Whenever possible, new lights on developments adjacent to existing development

shall connect to an existing service point. The service point may be in the form of a pullbox or a service pedestal installed by the Developer. See Standard Drawings 5-6 and 5-7 for design details.

2. Multiple service is two or more lights being served from a single service point installed by the Developer. The service point shall be a pullbox. Multiple systems shall have a service pedestal normally located adjacent to the PG&E service point. The service pedestal shall be a Caltrans Type III-AF, stainless steel cabinet.
 3. The County Engineer may approve overhead service in unusual areas where it cannot be provided underground. The Developer's Design Engineer shall be responsible for all electrical details and modifications to the standards relating to overhead service.
- I. Pullboxes:** All pullboxes, including the size, shall be shown and identified on the plans. Pullboxes shall be installed adjacent to all street lights, at junction points of conduit runs, and when distance between pull boxes exceeds 200 feet long. The standard pull box shall be a Caltrans #3½, with the cover labeled "Street Lighting", and shall be located at least 20 feet from any fire hydrant.
- J. Conductors:** All conductors, including quantity and size, shall be identified on the plans. Unless otherwise specified, conductors shall be single conductor, solid or stranded copper, sized in accordance with these standards and the National Electrical Code.
1. On a direct underground service, the minimum conductor shall be No. 8 A.W.G. In general, conductors larger than No. 2 A.W.G. will not be allowed.
 2. On multiple service, the minimum conductor size from the service point to the service can shall be No. 8 A.W.G.
 3. The size of each conductor from the service point to the luminaires shall be such that the voltage drop along each circuit will not exceed 7% for 2-wire systems and 6% for 3-wire systems of the nominal service voltage to the farthest luminaire. The nominal service voltage to be used in the voltage drop calculations shall be 115 volts. Calculations shall be submitted substantiating the design criteria for every circuit, including the total load in amperes of each circuit at the service can.
 4. The lamp amperage (or power demand) shall be based on total lamp wattage, including any losses in the ballast or other electrical components of the luminaire.
 5. Where only one photocell is required in a multiple service system, it shall be connected to the service can with three No. 14 A.W.G. conductors.
- K. Photo Cell:** A single photocell receptacle shall be provided on the luminaire nearest to the service point for multiple service containing four or more lights. All other light systems shall have a photocell in each luminaire.
- L. Conduit:** All conduit runs, including the size, shall be shown and identified on the plans. The minimum size for new conduits is one-and-one-half-inch (1½") diameter conduit. Minimum cover shall be 24 inches to finished ground in landscaped areas and 30 inches in roadway areas.
- For a system designed using the 3-wire system, only 2 circuits (one set of 3 wires) shall be allowed in any conduit. Circuits based on the 2-wire system and the 3-wire system shall not be mixed in any conduit. All circuits may, however, be mixed in the same conduit from the service can to the first pull box.

The design may include more than two circuits in a conduit if the conductors for each circuit (2-wire) or set of circuits (3-wire) are identified by conductor insulation which is a solid color or a basic color with a permanent colored stripe. The identification stripe shall be continuous over the entire length of the conductor.

New development shall install one-and-one-half-inch (1½") conduit, or larger as required, with one No. 10 A.W.G. stranded pullwire from the last light on each end of the system to the adjacent property line, where the adjacent property has no existing street lighting system.

- M. Electrical Equipment and Work:** Control and switching equipment and fusing of all circuits shall meet the requirements of the National Electrical Code, the Basic Electrical Regulations, Title 24, Part 3, of the California Administrative Code, the rules of the National Board of Fire Underwriters, and Yolo County.

5-8 MASTER PLANNING

Master planning is the determination of street light locations between control points. Control points are proposed street light locations at street intersections in accordance with the above sections and Standard Drawings 5-3 and 5-4, and existing streetlights. The purpose of master planning is to establish an overall uniform street light system that meets minimum requirements. Master planning shall apply to both sides of the street. The procedure is outlined as follows:

- A.** Identify the nearest intersections each way from the street light locations being planned. Determine the location of the streetlights at the intersections in conformance with the design standards in the above sections.
- B.** Identify any existing street lights situated between the intersections.
- C.** Determine the distance between the adjacent designed intersection streetlights and/or adjacent existing streetlights, whichever are nearest to the street light locations being planned.
- D.** Divide the distance into equal spaces between lights not to exceed the maximum spacing requirements specified in the above sections.
- E.** Compare the light locations to intersecting property lines, driveways, pedestrian lanes, and other obstructions as follows:
 - 1. If the location falls close to a property line and it can be adjusted to the property line while staying within the maximum spacing allowed, then the adjustment should be made.
 - 2. Generally, streetlights should be situated at intersecting property lines for residential lots and parcels with minimal frontage (75 feet or less). The light spacing may have to be unbalanced, with additional lights being added to attain this and still comply with the maximum spacing allowed.
 - 3. Street light locations shall be adjusted to miss driveways, mailboxes, utility boxes, and other obstructions by five feet, and shall be located at least 20 feet from any fire hydrant.
- F.** Street light locations on arterial streets should be adjusted, when possible, to obtain a more uniform light distribution if there are existing street lights on the opposite side of the street.