SECTION 7
STREET LIGHTING

7.01 GENERAL

A. General Requirements

These specifications shall cover the design and installation of street lights and park trail lights. The design and installation shall conform to these Design Standards, the Standard Construction Specifications, the Standard Details, and Section 86 of the State Standard Specifications.

B. Submittal Requirements

1. The Consulting Engineer shall show the existing and proposed street lighting system or park trail lighting system on separate street light plans of the project improvement plans.

   The plans shall include the following items:

   a. Location of electroliers.

   b. Location of service points.

   c. Location of pull boxes.

   d. Intensity of luminaries.

   e. Conduit size, lengths, and runs.

   f. Wire size, lengths, and runs.

   g. Mounting height and arm length.

   h. Service Voltage and wiring diagram.

2. The Consulting Engineer shall submit two (2) copies of the street light plans to the City for preliminary review. The Consulting Engineer shall then obtain service locations, service voltages and identification numbers from the Pacific Gas and Electric Company (PG&E).

   After the Consulting Engineer receives the service locations, he shall determine the wire size and length of each conduit run. These items may be shown in tabular form or denoted next to each conduit run on the plans.

   The cost for all PG&E services shall be paid for by the developer or contractor. This shall include the PG&E connection charge for energizing street lights.

7.02 DESIGN

A. Spacing, Intensity and Pole Heights

Street lights shall have the maximum spacing, distribution, mast arm length, intensity and pole heights according to the type of street on which they are to be installed as shown in the Standard Details 613.

Note that on Standard Detail 613, light spacing for streets with a width of 60 feet or more is based on a one-sided arrangement and that spacing for narrower streets is based on a two-sided arrangement. The one-sided spacing arrangement is a system whereby the street light spacing relates to the distance between street lights all on the same side of the street. The two-sided arrangement relates to the distance between street lights taking into consideration the street lights on both sides of the street. The actual constructed street width shall be the controlling factor for determination of street light spacing rather than the street classifications (arterial, collector, etc.)

1. The following steps shall be taken to determine the appropriate spacing and location for street lights.

    a. Identify the nearest intersections each way from the street light location being planned. Determine the location of the street lights at the intersections in conformance with the design standards.

    b. Determine the distance between the adjacent intersection requiring lights and then divide the distance into equal spaces. The spacing is not to exceed the maximum allowable spacing on Standard Detail #613.

    c. Compare the light locations to intersecting property line, driveways and other obstructions as follows:

2. 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.

3. Generally, street lights 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.

    a. Variations to these requirements may be approved on an individual basis by the City Engineer.

B. Location of Street Lights

1. On streets with separated sidewalks, street lights shall be located at the front of sidewalk, as long as the front of the street light foundation would not be more than five (5) feet behind the back of curb.

Otherwise, the front of the street light foundation shall be located five (5) feet behind the back of curb.

2. On streets with monolithic curb, gutter, and sidewalk, street lights shall be located at the back of sidewalk. The edge of the pole foundation shall meet the back of sidewalk.
3. Where there is only curb and gutter, the front edge of the street light foundation shall be located five (5) feet from the back of curb.
4. In cul-de-sacs, a street light shall be located within the bulb area.
5. For intersection lighting refer to Standard Detail #605.
6. Street Lights shall be placed on the outer edge of curves.
7. Street Lights shall be placed adjacent to bus stop shelters.

C. Lighting Distribution Pattern

1. All street lighting shall be as listed in the Standard Details.
2. All park trail lighting shall be Type IV - Symmetric Distribution Lighting.

D. Pull Boxes

1. Pull boxes shall be spaced at a maximum of 200 feet.
2. One pull box shall be located next to each electrolier unless there is a secondary electric service whose pull box is located within 8' feet of the electrolier and such electrolier is singularly serviced.
3. One pull box shall be located at each side of all street crossings.
4. Pull boxes shall be placed immediately behind the sidewalk in sidewalk areas or five (5) feet behind the back of curb in non-sidewalk areas.
5. Pull boxes shall be located at any angle point greater than 45 degrees.

E. Ballasts

All street lights shall have a regulator type ballast.

F. Voltage Drop Calculations

Voltage drop calculations shall be submitted whenever four (4) or more lights are served from a single source point. The calculations shall be done in accordance with the Standard Details. The maximum permissible voltage drop is 5%.

G. Photocells

A photocell shall be included on each separate luminaire.

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.

1. Types of service are as follows:
    a. A direct underground service consists of one or two lights being served from a single service point. The service point may be in the form of a service pullbox installed by the Developer, which is connected to a secondary splice box provided by PG&E.
    b. A multiple service is three or more lights being served from a single service point. The service point shall be in the form of a service pullbox installed by the Developer. Multiple systems shall have a State Standard Type III-AF service equipment enclosure (Anodized Aluminum Cabinet) located adjacent to the service point.

I. Conduit Fill

1. The National Electric Code limits the portion of the conduits cross section that can be occupied by conductors to the following:
    a. One (1) Conductor - 53%
    b. Two (2) Conductors - 31%
    c. Three (3) or more conductors - 40%
2. As a practical limit projects for new construction/installation should be designed with 26% of the conduit x-section occupied by conductors. Standard Detail #612 lists conductor sizes and available conduit area.

J. Conduit Locations

1. In separated sidewalk locations, conduit shall be placed under the front edge of the sidewalk closest to the street.
2. In monolithic curb, gutter and sidewalk locations, conduit shall be located under the back edge of sidewalk farthest from the street.