

**COUNTY OF SAN DIEGO
STREET LIGHT SPECIFICATIONS
LOW PRESSURE SODIUM LIGHTS
REVISED 2006**

**FOR ALL AREAS WITHIN 15 MILES OF
PALOMAR OR MT. LAGUNA OBSERVATORIES**

1. Materials (General)

LAMPS: Low Pressure Sodium: 90 or 180 watt. (See Item 3)

LUMINAIRES: GE HPS cobra heads, flat lens, aluminum gray color, terminal block, no power door or power tray. Specify for use in San Diego County. (See Item 2)

Pacific Lighting
Pageant/Bieber
Spaulding
Visionaire

PHOTOCELLS: Blue cap - 120/240 volt (See Item 5)

CONCRETE POLE: Round concrete, gray color, anchor-base or direct-burial type. (See Item 12)

<u>Luminaire Size</u>	<u>Pole Height</u>	<u>Mounting Height</u>
90-Watt	25' +/- 2'	27' +/- 1'
180-Watt	28' +/- 2'	30' +/- 1'

Manufacturers: Ameron

NOTE: 180-watt installation requires Ameron Pole MBBX08#123MRSPX8A or equivalent. (See Item 12)

MAST ARMS: 8-foot aluminum or steel. (See Item 14)

NON-STANDARD OR DECORATIVE LIGHTING: Other types and styles of poles and /or luminaires may be allowed with permission of the engineer.

2. Luminaires

Luminaires shall be completely assembled and made of die-cast aluminum or

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heavy gauge sheet aluminum with continuous concealed welds. Painted exterior surfaces shall be finished with a fused coating of electrostatically applied polyester powder paint or other ultraviolet inhibiting film. Color shall be aluminum gray.

Luminaires shall be furnished with an optical assembly removable without the use of special tools and shall include an integral twist-lock type receptacle for a photoelectric cell control in accordance with the latest EEI-NEMA standards that is adjustable with respect to north and pre-wired to the terminal board.

Luminaires shall be designed for horizontal mounting with a horizontal burning lamp. They shall have a slip-fitted mounting bracket capable of attaching to a two-inch (2") pipe without the need for special mounting parts. They shall be installed in a horizontal position with leveling and clamping to the mast arm pipe accomplished by tightening mounting bolts, which are externally or internally accessible. Bolts shall be minimum 5/8" x 2" size and either stainless steel or cadmium plated steel.

The luminaire power unit assembly shall consist of an integral ballast, capacitor, and heavy-duty terminal block. The power unit assembly shall be mounted on a separate component of the luminaire to facilitate replacement.

The ballast assembly shall be enclosed in a separate compartment from the optical assembly. Both compartments shall be sealed with a heat-resisting gasket and shall be watertight. The optical assembly door shall be hinged on the long edge of the luminaire, and the hinge pins shall prevent the door from swinging free of the pins. The luminaire shall be constructed to provide the required light distribution, with the lower edge of the luminaire housing below the entire light source and lens. The Lens shall be a flat type unless approved by the engineer. The light distribution pattern and maximum weight (including ballast) shall be as follows:

<u>Light</u>	<u>Pattern</u>	<u>Net Weight</u>
90-Watt HPS	Type II	50 pounds
180-Watt HPS	Type III	55 pounds

3. Lamps

Lamps shall be low pressure sodium vapor, with clear glass bulbs, suitable for use in street lighting, and designed to operate in a horizontal position. The rated average life shall be 18,000 hours or more, and the lumen output shall be 13,500 for 90-watt lamps and 33,000 for 180-watt lamps.

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4. Ballasts

High pressure sodium ballasts shall be component type, consisting of precision wound coils and welded magnetic steel laminations assembled together and impregnated with baked on insulating, weather-proof varnish and metal-cased hermetically sealed capacitor, suitable for use on multiple distribution circuits with 60HZ, 120 or 240 volt rating.

The operating sound pressure noise level shall not exceed the ambient noise level by more than five (5) decibels at a distance of 30 feet when measured by a sound level meter conforming to the American Standards for Sound Level Meters. Where the ambient noise level is less, a minimum of 40 decibels shall be assumed.

5. Photoelectric Control Unit

The photoelectric unit shall consist of a photoelectric cell in a weather-proof housing which plugs into an EEI-NEMA twist-lock receptacle integral with the luminaire and shall be installed with the photocell window facing north.

The control unit shall contain a cadmium-sulfide photoelectric cell suitable for operation with 120 or 240 volt line supply, with surge protection to prevent damage, and made to fail in the "ON" position (blue cap). The unit shall have a rated load capacity of 1,000 volt-amperes minimum, with a normal power consumption of not more than 10 watts.

The response level of the unit to changing light levels shall remain stable throughout the life of the unit. The "Turn-on" level shall be between 1 and 5 foot-candles; the "Turn-off" level shall be between 1 1/2 and 5 times the "Turn-on" level.

6. Fuses

Fuses shall be slow blow 13/32" x 1 1/2" in-line type in appropriate sizes as follows:

<u>Lamp Size</u>	<u>Fuse Size</u>
90-Watt	10 Amp
180-Watt	20 Amp

The fuse shall be installed in the hot leg of the lighting conductor. The circuit shall be fused in the base of the pole – **not in the pull box**. A 240-volt installation requires each leg to be fused using a double fuse holder and two fuses of appropriate size as listed above.

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7. Fuseholders

Fuseholders shall be completely waterproof, shall grip the fuse in the load side section when opened, and be able to take a 13/32" x 1 1/2" fuse, with crimp-type tubular terminals of a proper size for the cable in the particular light.

8. Wiring and Service Runs

Service runs shall be minimum #10 stranded THW copper wire (not aluminum). Wire shall conform to the applicable portion of ASTM B3 and B8. Size of wire shall be indicated on the "As Built" plans. Wire connectors shall be approved by the Engineer and shall bear the UL seal of approval. The installation procedure, connector size, and crimping tools shall conform to the manufacturer's recommendations.

Wire from the base of the pole to the luminaire shall be #10 THW. For 120-volt installations, the wires shall be black and white, with black being the hot wire and fused. For 240-volt installations, both wires are to be black and fused. Any ground wires shall be green and connected to a clamp attached to an anchor bolt. No exceptions. No phase tape allowed. All UFER ground wires shall be #4Cu x 15' installed below a foundation. A correctly installed ground rod will be acceptable as well. (See Regional Standard Drawing)-E-2 with non metallic conditions.

Service runs parallel to the street shall be installed under the sidewalk where new sidewalk is being constructed or directly behind the existing sidewalk. Voltage drop shall not exceed 5%. Contractor is responsible for determining and calculating wire size.

9. Splicing

Splices shall be permitted in pull boxes and lighting standard bases only. All splices shall be waterproofed with epoxy encapsulation or heatshrink tubing.

10. Conduit and Trench

All conduit shall be 1 inch (1") UL approved heavy wall polyvinyl chloride (PVC) Schedule 40. Conduit shall be encased in a minimum of 3 inches (3") of sand on all sides. The contractor may, at his expense, use conduit of a larger size, provided the larger size is used for the entire length of the runs between pull boxes. Reducing couplings shall not be allowed.

Conduit shall be laid to a depth of not less thirty inches (30"), unless placed

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under sidewalk, in which case only eighteen inches (18") shall be required. Conduit laid in open trench shall not be covered nor shall any trench or inspection hole be backfilled until accepted by the Engineer.

11. Pull Boxes

State No. 3-1/2 Pull Boxes (15 3/8" x 10 1/8") or equivalent shall be installed per CALTRANS Standard Plan ES-8 as follows:

- a) Within five feet (5') of each street light.
- b) Within three feet (3') of service point (NOTE: if street light is within ten feet (10') of the service point, only one pull box is required).
- c) At intervals of not more than 200 feet.

The bottom of the pull box shall rest firmly on a six inch (6") thick bed of 1" crushed rock extending six inches (6") beyond the outside edges of the box. Pull boxes shall be installed behind sidewalk or five feet (5') behind the face of curb or dike, and where practical shall be installed with the short side parallel to the curb. They shall not be installed in any part of a driveway or other traveled way unless approved by the Engineer and provided with a metal traffic cover. Pull box covers shall be inscribed "STREET LIGHTING" and shall be secured with 3/8" bolts, cap screws or studs, and nuts made of brass, stainless steel or non-corroding material.

12. Concrete Poles

Concrete poles shall be tapered, centrifugally cast and prestressed. Poles shall be round black and white marble aggregate or natural exposed aggregate. Pole shape and color shall be uniform for any one project. Replacement poles shall match existing.

The ultimate strength of a pole shall be calculated in accordance with the latest revision of American Concrete Institute (A.C.I.) standard 318. Under working loads (including wind loading, as specified in the latest edition of AASHTO standards), the pole must not be stressed beyond the cracking strength. The pole and mast arm must be capable of handling the EPA and weight of the luminaire.

Aggregates shall conform to current requirements of ASTM C33, except that abrasion requirements therein shall not apply and that no more than seven percent (7%) shall pass a #100 mesh sieve. No dye or sealer shall be used.

The centrifugal casting process shall produce a center duct throughout the length of the pole, which shall be free from sharp projections or edges and shall be a

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minimum of 1-1/2" in diameter. All reinforcing steel shall have a minimum cover of 5/8" inches of concrete. After curing, the surface of the pole shall be treated to remove cement laitance and to develop the surface texture. When finished, poles shall be without cracks or crazing and shall have a uniform surface (without objectionable mold marks) and texture throughout the entire length. Maximum deviation from string line at any point shall not exceed 0.03" per foot of length.

Handhole cover plates shall be aluminum, and securing bolts shall be stainless steel tamper-proof bolts of the type installed with a pent-head wrench.

13. Installation

Installation shall be in accordance with Regional Standard Drawings E1 and E2. Street light poles shall be installed 7 feet (7') behind face of curb or berm unless otherwise shown on the plans or directed by the Engineer.

Anchor bolts shall be the type and size shown on Drawing E-1 and shall conform to the specifications of ASTM A 307 and be provided with two nuts and two washers each. Bolts, nuts, and washers shall be galvanized by the hot-dip process conforming to ASTM A 153 or cadmium plated with Type NS coating conforming to ASTM A 165. Direct burial poles may use 2-sack mix slurry backfill. 6' foundation cap to be installed once pole installation is complete.

Plumbing of the standard shall be accomplished by adjusting the nuts on the anchor bolts before the foundation cap is placed. Shims or other similar devices for plumbing or raking will not be permitted. After plumbing the standard, anchor bolts shall be cut off 1/4" above the nuts and the exposed surfaces shall be repaired.

A 30x30x6 inch concrete foundation cap shall be installed at grade, with a 2% slope to curb or sidewalk unless alternate installation is approved by the engineer.

14. Mast Arms

Mast arms shall be two inch (2") I.P.S. aluminum or galvanized steel and shall be self-supporting without braces, scrolls, or rods. Mounting shall be perpendicular to the street centerline unless otherwise directed by the Engineer. They shall have a minimum of six inches (6") of horizontal straight section at the end of the arm to mount a two inch (2") I.P.S. slipfitter type luminaire mount.

Mast arms shall be 8 feet (8') long in order for the luminaire to overhand the street by one foot, unless otherwise specified in the plans. Mast arms shall be

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capable of handling the EPA and weight of the luminaire. Aluminum arms shall be corrosion resistant alloys such as Aluminum Association wrought alloys 6061 or 6062 or cast alloys 319 or 356.

All exposed hardware shall be stainless steel. All protected hardware, not visible after installation, shall be cast aluminum and/or stainless steel, hot-dipped galvanized, or cadmium plated steel.

15. Service Points

Service points must be in the County right-of-way. Service runs across private property are not acceptable. To obtain service from SDG&E call (858) 564-1218. If existing service is from a power pole SDG&E must install a new underground service point at the customer's expense. In some cases, an existing street light may be used for service hookup if approved by an Engineer.

16. Energizing and "As Built" Plans

Two (2) sets of "As Built" plans (see sample Page 8) must be submitted to the Engineer prior to energizing. "As Built" plans must include:

- a) Wattage, type (LPS, etc.), and manufacturer of lights.
- b) Location of each light and service point.
- c) Location of conduit runs and pull boxes.
- d) Length of wire runs and size of wire.
- e) Voltage of system.
- f) Contractor name and date.

17. Guarantee

All installations are to be guaranteed for a period of one year from the date of acceptance by the County for maintenance.

18. Other Notices

The term "Engineer" shall mean the representative of the County charged with the responsibility of enforcing County Standards. Technical decisions shall be the responsibility of the Manager of the County Lighting District, telephone (858) 571-4259.

For additional information on street light installation see:

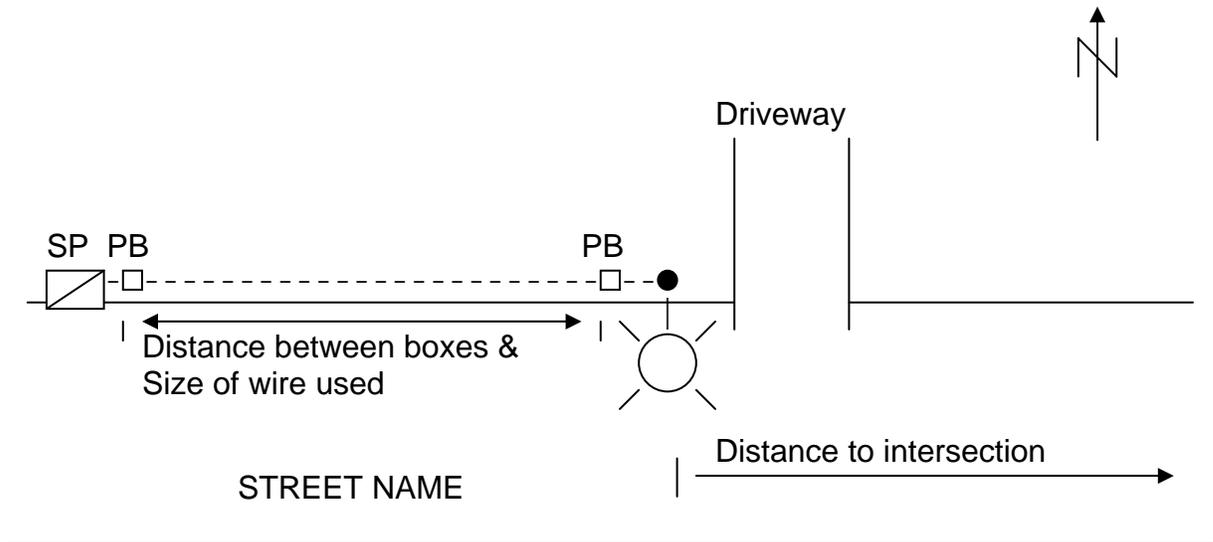
- a) San Diego Regional Standard Drawings.
- b) Section 5.8 (Roadway Lighting) of Public Road Standards, County of San Diego, Department of Public Works.
- c) Special Provisions for Work Done Under Excavation Permits.
- d) Standard Specifications for Public Works Construction.

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- e) Standard Special Provisions to the Standard Specifications.

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SAMPLE "AS BUILT" DRAWING



STREET LIGHT 'AS BUILT' FOR LOCATION NAME/PROJECT #

- VOLTAGE
- SIZE FIXTURE, MANUFACTURER
- POLE MANUFACTURER, TYPE, NUMBER
- WIRE TYPE AND SIZE
- COMPANY NAME AND DATE OF AS BUILT