



County of San Diego

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COUNTY OF SAN DIEGO STREET LIGHTING SPECIFICATIONS – REVISED January 2015

Street light specifications contained in this document shall supersede, and or, be included as a supplement to the County Public Road Standards and should be referred to by County Planners as well as private developers, property owners and their consultants in the preparation of development plans.

All County of San Diego major roadways with pavement width of 40 feet or more shall have 250 watt equivalent LED fixtures installed.

All County of San Diego local roadways with pavement width of less than 40 feet shall have 100 watt equivalent LED fixtures installed.

Note that all LED fixtures shall be rated at 4000 (+/- 250) Kelvin. Both 250 watt and 100 watt equivalent fixtures shall meet Average Illumination requirements discussed in Table 4 of the current County of San Diego Public Road Standards.

1. Materials (General)

LAMP TYPE: LED (See Item 3)

LUMINAIRES: The County has approved a maximum Correlated Color Temperature (CCT) of 4000 Kelvin, +/-250 Kelvin. A minimum 10 year warranty is required for the LED fixture and the adaptive control system. Both shall be the same manufacturer. Fixtures shall have 4000 Kelvin CCT LED type per specification. The County of San Diego requires a General Electric (GE) Evolve Scalable LED (or an approved equal). (See Item 2)

PHOTOCELLS/ADAPTIVE CONTROLS: GE Light Grid Nodes
GE-ELWNOA5UG5 (or an approved equal) (See Item 5)

CONCRETE POLE: Round concrete, gray color, anchor-base per County of San Diego Drawings E1 - E2. Direct-burial type may be considered on a case-by-case basis and only with written approval from the County Traffic Engineer. (See Item 12)

Luminaire Size Pole Height Mounting Height

100-Watt Eq.	25' +/- 2'	27' +/- 1'
250-Watt Eq.	28' +/- 2'	30' +/- 1'

Manufacturers: Ameron (or an approved equal)

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 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.

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>
100-Watt Eq.	Asymmetric Medium	<30lbs
250-Watt Eq.	Asymmetric Medium	<30lbs

3. LED Lamp Type Fixtures

All new fixtures shall provide illuminance equivalent to 100 watt or 250 watt high pressure sodium fixtures. Energy consumed by each fixture shall be in the range of 25 watts to 35 watts and 110 watts to 115 watts for both respective 100 watt and 250 watt equivalents.

4. Ballasts

LED fixtures do not utilize ballast technology. Fixtures with ballasts of any kind will not be accepted. LED driver current shall be 525ma for both 100 watt and 250 watt equivalent fixtures.

5. Photoelectric/Adaptive Control Unit

The units shall provide both photoelectric and adaptive control capabilities. The wireless control system allows remote monitoring and control, utility grade energy metering and GPS mapping of street lights. The photoelectric unit shall consist of a photoelectric cell in a weather-proof housing which plugs into an EEL-NEMA twist-lock receptacle integral with the luminaire and shall be installed with the photocell window facing north.

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>
100-Watt Eq.	10 Amp
250-Watt Eq.	10 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.

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.

For 240-volt installations, both wires shall be black, or black and red. Any ground wires shall be green and connected to the UFER ground, or a ground rod. No phase tape allowed. All UFER ground wire shall be a bare #4Cu x 15' installed below the foundation and attached to an anchor bolt within the foundation and routed up to the hand hole access area. A correctly installed ground rod will be acceptable as well. (See Regional Standard Drawing)-E-2 with nonmetallic conditions.

Service runs parallel to the street shall be installed under the sidewalk where new sidewalk is being constructed or directly behind existing sidewalk. Voltage drop shall not exceed 5% for any circuit. Contractor is responsible for determining and calculating wire size. Wire installation shall NOT proceed until the contractor has received the Engineer agreement to the proposed 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 heat shrink tubing.

10. Conduit and Trench

All conduits 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 duct seal shall be required on all unused conduits.

Conduit shall be laid to a depth of not less thirty inches (30"), but no more than 42 inches (42") unless placed under sidewalk, in which case 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.

All pull box installations shall be accompanied by a properly installed anti-theft device. A McCain vandal resistant pull-box insert, model #M64973-02, or approved equal, shall fit a Caltrans #3 1/2 pull box, unless otherwise directed by the County Traffic Engineer. The anti-theft pull box inserts shall be installed in every street light related pull box, regardless of the wiring run length. The County will provide the proper padlock upon final acceptance of the new street lights.

Any deviation from this requirement must receive written approval from the County Traffic Engineer during the plan review and/or inspection processes.

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 meets Caltrans Standard Plans ES-8B. 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

All street light poles shall be anchor base. Direct-burial type may be considered on a case-by-case basis and only with written approval from County Traffic Engineer.

Concrete poles shall be tapered, centrifugally cast and pre-stressed. Poles shall be round, gray color, with black and white marble aggregate or natural exposed aggregate. Pole shape and color shall be uniform. 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 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.

Hand-hole cover plates shall be aluminum, and securing bolts shall be stainless steel tamper-proof bolts of the type installed with a penta-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.

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 with a rust inhibitor.

Once the pole installation is complete, 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. slip fitter 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 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 allowed. 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 rare cases, an existing street light may be used for service hookup if approved by an Engineer and the applicant provides the voltage drop calculation showing that the existing circuit can handle the additional power load for the new streetlight without exceeding the 5% voltage drop threshold for the entire streetlight electric circuit.

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) LED type, wattage 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.

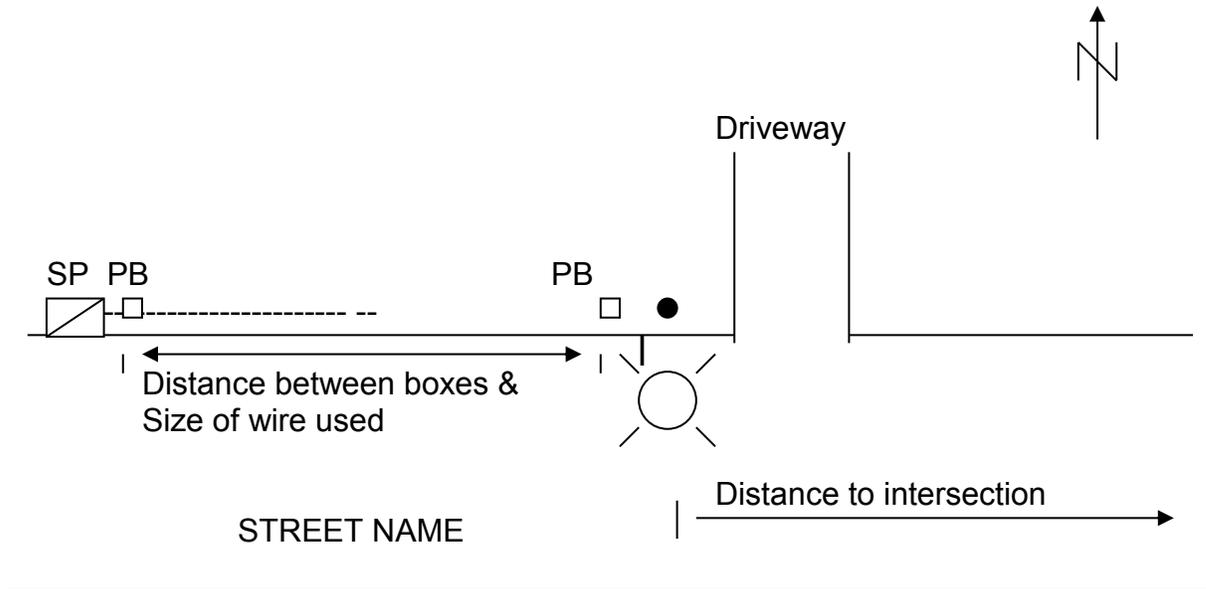
18. Other Notices

The term "Engineer" shall mean the County Traffic Engineer or his representative with the responsibility of enforcing County Standards.

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.
- e) Standard Special Provisions to the Standard Specifications.

SAMPLE "AS BUILT" DRAWING



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

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VOLTAGE
LED TYPE, WATTAGE, MANUFACTURER
POLE MANUFACTURER, TYPE, NUMBER
WIRE TYPE AND SIZE
COMPANY NAME AND DATE OF AS BUILT