



STREET LIGHTING STANDARDS AND SPECIFICATIONS

Revision 12/19/17

A handwritten signature in blue ink, appearing to read "Matt Little", is written over a horizontal line.

Matt Little
City Engineer

12/19/17
Date

GENERAL

New or relocated streetlights or safety lights at signalized intersections located within City R/W or City easements are required to include light emitting diode (LED) luminaires and constructed per City standards and per plan, and field inspected and approved prior to requesting energizing or acceptance.

INDUSTRY STANDARDS

LED streetlight luminaires shall meet the applicable requirements of the following industry standards:

1. ANSI/NEMA/ANSI C78.377-2011-Specifications for the Chromaticity of Solid-State Lighting (SSL) Products
2. IES LM-79-08 – Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products
3. IESNA LM-80-08 – Approved Method measuring Lumen Maintenance of LED chips / Fixture Manufacturer must provide extrapolation explanation for Lumen Maintenance derived from In-Situ testing upon request.
4. IEEE C62.41.2-2002-IEEE Recommended Practice on Characterization of Surges in Low-Voltage (1000 V and less) AC Power Circuits
5. IESNA TM-15-11 & Addendum A (replaces TM-15-07 and TM-15-07 Addendum A) – Luminaire Classification System for Outdoor Luminaires; Backlight, Uplight, and Glare (BUG) Ratings
6. ANSI/UL 1598 – Poles & luminaires; UL
7. ANSI/UL 8750: Additional requirements for LED luminaires as well as drivers and LED arrays

Test data that establishes compliance with the requirements of ANSI/UL 1598 and the other industry standards listed above shall be provided upon request.

REFERENCE

1. Project Plans and Specifications – Location and project –specific details
2. California Electric Code – As applicable by the Building Department
3. SDG&E Standards – As applicable
4. City Standard Drawings
5. Standard Specifications for Public Works Construction (Greenbook) (latest edition) – Subsections 209 and 307 and all included cross references.
6. San Diego Regional Standard Drawings E-1 & E-2 (as applicable) – for anchor base foundation and ground wire only.
7. Manual of Uniform Traffic Control Devices (MUTCD) (latest edition) – for traffic control and sign installation on poles

WIRELESS TELECOMMUNICATION FACILITIES (WTF)

San Marcos Municipal Code (SMMC) § 20.465.050 establishes an ordered list of locations listed in priority of the City's preference for wireless telecommunications facilities to be located throughout the City. This policy serves to implement the City's preference for wireless telecommunication facilities to be located on City-owned street light poles within the Public Right-of-Way. Any proposed WTF installed on a street light poles will comply with all the standards and provisions provided for within this document.

Only one wireless installation will be allowed per street light pole; however, more than one carrier may be allowed to share the equipment of a neutral host provider. Priority to install on public street light poles will be given on a "first-come first-served basis."

Public Street Light Poles not in compliance with the City's standards must be upgraded prior to the installation of the wireless telecommunication facility.

Signage on the pole base shall comply with all relevant provisions of ANSI C95.2, and must identify the owner of the attached equipment, equipment ID, and provide a 24 hour contact number to its network operations center, and such telephone number shall be able to reach a live person who can exert transmitter power-down control over this site as required by the FCC.

STREET LIGHT LOCATIONS

Street lights shall be located as follows:

1. At intersections, on a minimum of two legs of a four, or more, legged intersection or all legs as directed by the City Engineer.
2. At opposite curb on extended centerline on "T" intersection.
3. At center of cul-de-sac curb.
4. On outside of horizontal curves and knuckle.
5. On vertical curves (crest and sag locations).
6. At roundabouts, bulb outs, and marked crosswalks.

Wireless telecommunication facilities may be installed on any existing public street light pole location listed above.

LUMINAIRES

Fixtures shall be one of the following:

STREET LIGHTING (3,000K)

GE Evolve Catalog #: ERL1004B330AGRAYL (LED System watts = 45; residential)

GE Evolve Catalog #: ERL1004D330AGRAYL (LED System watts = 45; tilted 2.5 degrees up; cul-de-sacs)

GE Evolve Catalog #: ERL1007C330AGRAYL (LED System watts = 95; Type 5; collectors)

GE Evolve Catalog #: ERLH011D330AGRAYL (LED System watts = 148; arterials)

SAFETY LIGHTING AT SIGNALIZED INTERSECTIONS (4,000K)

GE Evolve Catalog #: ERLH010C340AGRAYL (LED System watts = 90; residential/residential intersections)

GE Evolve Catalog #: ERLH011C340AGRAYL (LED System watts = 108; collector/residential, collector/collector, collector/major, residential/major intersections)

GE Evolve Catalog #: ERLH013C340AGRAYL (LED System watts = 125; major/major intersections)

General description of LED – Standard fixture utilizes terminal block for power input suitable for #6 - #14 AWG wire operates at 700mA. Drive current is not field switchable. A three-pole terminal block capable of accepting #14 to #10 AWG shall be mounted to the housing inside the electrical compartment. Luminaire shall be provided with capability for optional backlight control. Complete assembly weight shall not exceed 45 lbs. Fixture is designed to mount on a schedule 40, 2" nominal pipe size (NPS) horizontal tenon (minimum 8' in length) and is adjustable +/- 5 degrees to allow for fixture leveling (includes two axis T-level to aid in this process). Fixture, including the LEDs, drivers and electrical components, shall carry a limited ten year warranty and housing paint and finish shall carry a ten year warranty.

Color temperature and CRI: 3000K color temperature for street lighting, minimum 70 CRI
4000K color temperature for safety lighting, minimum 70 CRI

LUMINAIRE HOUSING

Luminaire housing shall be furnished with an optical assembly, be powder-coated silver, include a level bubble to facilitate installation, allow for tool-less entry and shall include an integral twistlock type receptacle for photoelectric cell control in accordance with the latest EEI-NEMA standards which is adjustable with respect to north and pre-wired to the terminal board.

Luminaire external housing shall have a minimum rating of IP56 as specified in IEC 60529, with the ability to shed water from inside the housing (i.e. weep holes).

The LED luminaire shall be designed for horizontal mounting. The LED assembly 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" x2" size stainless steel.

Luminaire circuitry shall include quick connect / disconnects to allow easy separation and removal of driver and power door. See City of San Marcos Standard Drawing ELE-3. Grounding requirements: ANSI/UL Standards and NFPA 70.

The luminaire power unit assembly shall consist of an integral driver, capacitor, 10K surge suppressor, and heavy-duty terminal block. The power unit assembly shall be mounted on a separate component of the luminaire to facilitate replacement.

The luminaire optical chamber shall have a minimum rating of IP66 as specified in IEC 60529.

The luminaire housing cooling system shall consist of a passive heat sink with no fans, pumps, or liquids and shall be designed and constructed to accept a standard plug type, locking, three-pole, three-wire, streetlight photocontrol. The fixture and finish endurance tested to withstand 5,000 hours of elevated ambient salt fog conditions as defined in ASTM Standard B 117.

All fasteners shall be stainless steel and all polycarbonate components shall be UV stabilized.

An easily-viewable nameplate shall be permanently affixed to the inside of each luminaire housing. The nameplate shall contain the following information: manufacturer's name, manufacturer's catalog number, date of manufacture (month and year), plant location, input power consumption, driver output current, IEC IP Rating, correlated color temperature (CCT), IES light distribution type, IESNA TM-15 BUG ratings, and serial number. Utility approved luminescent name plate with light source and wattage shall be permanently affixed on the exterior of the Luminaire to be visible from the ground.

The driver assembly shall be enclosed in a separate compartment from the optical assembly. The entire fixture shall be 'wet listed' with the optical assembly compartment being rated at IP66. The LED Luminaire shall be constructed to provide the required light distribution with the lower edge of the Luminaire housing below the entire light source close contact refractors. The Luminaire must be Dark Sky Compliant with U0 bug rating. The light distribution pattern shall be per the FIXTURE table shown:

OPTICAL DISTRIBUTION METHOD & CONFIGURATIONS

Optical configurations shall meet the following criteria:

1. Close contact refractors to be employed for optical distribution.
2. Refractors are to be polymeric material rated 5VA, f1 rating
3. Lumen maintenance at 50,000 hours of life to be no less than 88% of initial lumen output
4. Shall have 95% survival rate at 50,000 hours
5. Integral 10K surge suppressor for diode and entire system protection

STREET LIGHTING (3,000K)

Fixture Application (@100 hours)	LED Fixture Wattage	Minimum Lumens	Light Distribution Type
Residential Streets	45 Watts	3,500 Lumens	IESNA Type V
Cul-de-sacs	45 Watts	3,400 Lumens	IESNA Type III
Collectors	95 Watts	5,600 Lumens	IESNA Type V
Arterials	148 Watts	8,600 Lumens	IESNA Type V

SAFETY LIGHTING (4,000K)

Fixture Application (@100 hours)	LED Fixture Wattage	Minimum Lumens	Light Distribution Type
Residential/Residential Intersections	95 Watts	8,000 Lumens	IESNA Type III
Collector/Residential Intersections	130 Watts	9,100 Lumens	IESNA Type III
Collector/Collector Intersections	130 Watts	9,100 Lumens	IESNA Type III
Collector/Major Intersections	130 Watts	9,100 Lumens	IESNA Type III
Residential/Major Intersections	130 Watts	9,100 Lumens	IESNA Type III
Major/Major Intersections	148 Watts	10,300 Lumens	IESNA Type III

DRIVERS

Light Emitting Diode (LED) drivers shall be component-type consisting of precision wound coils and welded magnetic steel laminations assembled together and impregnated with baked-on, insulating, weatherproof 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 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.

Power supply / driver shall be field replaceable by means quick-disconnect connectors and easy access mounting hardware. Power supply / driver shall be wet-listed in the US and Canada, UL, ROHS compliant, meet Caltrans 611 vibration testing and GR-63-CORE section 4.4.1/5.4.2 earthquake zone 4.

DRIVER SPECIFICATIONS

Electronic; voltage range = universal 120 – 277 v +/- 10%; frequency = 50/60 Hz; power factor > 90% @ full load; THD < 20% @ full load; output ripple < 10%; output shall be isolated; case temperature rated for -40 to 60C; fully encased and potted; overheat protection, self limited short circuit protection, and overload protected – minimum integral 10k surge protection tested in accordance with IEEE C62.41 and ANSI standard 62.41.2; Driver Life Rating not less than 100,000 hours.

PHOTOELECTRIC CONTROL UNIT

Fisher-Pierce # TRS-2 105-305 VAC LED control or approved equal.

The photoelectric unit shall consist of a photoelectric cell in a weatherproof housing which plugs into an EEL-NEMA twist-lock receptacle integral with the luminaire and shall be installed with the clear UV-stabilized photocell window facing north. The control unit shall contain a uniformly coated 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. The unit shall have a HID load rating of 1,800 VA with a Tungsten load rating of 1,000 watts.

The response level of the unit to changing light levels shall remain stable throughout the life of the unit (5,000 operations). The "turn-on" level shall be nominal 1 foot-candle and the "turn-on: turn-off" ratio shall be 1.5.

FUSES

Fuses shall be slow blow 13/32" x 1 1/2" in-line type in 10 amp size (unless specified otherwise by the City). 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. 240-volt installations require each leg to be fused using a double fuse holder and two fuses of appropriate size. Heat shrink both crimp ends.

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.

IDENTIFICATION

Each LED luminaire shall have the manufacturer's name, trademark, model number, serial number, date of manufacture (month-year), and lot number as identification permanently marked inside each unit and the outside of each packaging box.

The operation characteristics such as rated voltage and rated power in watts and Volt-Ampere shall be permanently marked inside each LED luminaire unit.

QUALITY ASSURANCE

LED luminaire manufacturer shall provide a 10.5 year warranty on LED luminaires that includes LEDs, housing, drivers, and finish.

LED luminaire manufacturer shall use IESNA LM-80 data to predict luminaire lifetime and shall demonstrate a suitable testing program incorporating high heat, high humidity and thermal shock test regimens to ensure system reliability and to substantiate lifetime claims.

Electrical and light technical properties shall be recorded for each LED luminaire during manufacture. This should include lumen output, CCT, and CRI at a minimum. Each luminaire shall utilize a unique serial numbering scheme. Technical properties must be made available for a minimum of 5 years after the date of manufacture.

Luminaires shall be fully assembled and individually electrically tested prior to shipment.

SUBMITTALS

Product data submitted for approvals shall include, but not limited to materials, finishes, photometric performance, photometric layouts, dimensional information and LM-79 report for each luminaire conducted by National Voluntary Laboratory Accreditation Program (NVLAP), accredited photometric laboratory.

DELIVERY, STORAGE, AND HANDLING

Deliver luminaires and components carefully to avoid breakage, bending and scoring finishes. Do not install damaged equipment.

Store luminaires and accessories in original cartons and in a clean, dry space; protect from weather and construction traffic.

MAST ARMS

Mast arms will be 8-foot long and made of aluminum.

Mast arms shall be two inch (2") I.P.S. galvanized steel or aluminum and shall be self-supporting without braces, scrolls or rods. Mounting shall be perpendicular to the street centerline unless otherwise directed by the City 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 eight feet (8') long for all luminaires unless otherwise specified in the plans and shall be capable of handling the EPA and weight of the luminaire. Steel arms shall conform to ASTM A 120. 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. Anti-seize shall be used .

FOUNDATIONS

Per SDRSD No. E-1 and E-2. Anchor base foundation only. For E-2, use No. 4 for ground wire; no ground rods.

Anchor bolts shall be the type and size shown on SDRSD E-1 and shall conform to the specifications of ASTM A 307 and be provided with two nuts and two washer each. Bolts, nuts and washers shall be galvanized by the hot-dip process conforming to ASTM A 153.

CONCRETE POLES

When telecom facilities are to be placed on a pole, the pole to be used will comply with the corresponding "telecom" pole standard as indicated by location adjacent to functional classification.

RESIDENTIAL STREETS: Ameron DWG. 1203-036 Rev. 4

COLLECTOR AND ARTERIAL STREETS: Ameron DWG 1203-037 Rev. 4

RESIDENTIAL STREETS (TELECOM): Ameron DWG 1203-035

COLLECTOR AND ARTERIAL STREETS: Ameron DWG 1203-023

Note: Use 8' arm poles located adjacent to the sidewalk on residential, collector and arterial streets)

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 minimum of one and one-half inch (1-1/2") in diameter. All reinforcing steel shall have a minimum cover of five-eighths inch (5/8") 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 pent-head wrench. Anti-seize shall be used.

PROTECTIVE COATINGS FOR POLES

All poles shall be provided with a clear, factory applied Amershiel Anti-Graffiti coating.

PULL BOXES (SEE ATTACHED SPECIFICATIONS)

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

1. Located at the end of the conduit run and three feet (3') from SDG&E service point and five feet (5') clear of curb face (NOTE: if the street light is within ten feet (10') of the service point only one pull box is required.
2. Located within five feet (5') of each street light.
3. Located at conduit interval runs of not more than 150 LF. Additional #3-1/2 pull boxes will be required for conduit runs over 150 LF long.

The bottom of the pull box shall rest firmly on a six-inch (6") thick bed of three-quarter-inch (3/4") 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. 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 materials. Anti-seize shall be used. (1) OES Rex Key shall be provided for each installed pull box to the City.

CONDUIT AND TRENCH

- Conduit shall be two inch (2") UL approved heavy wall polyvinyl chloride (PVC) pipe, Schedule 80.
- Larger conduit may be used, at the contractors expense, provided the larger size is used for the entire run between pull boxes. Reducing coupling will not be allowed.
- The conduit pipe zone will extend 3" below the bottom of conduit and 10" above top of conduit. Pipe zone will be backfilled with sand.
- Conduit will have a minimum of 3" clearance horizontally from trench wall.
- Electrical marking tape will be placed along the conduit prior to burial.
- Conduit must have a minimum 30" burial depth, as measured from finish surface to top of conduit.
- Conduit runs shall not exceed 270 degrees of bend.
- Duct seal shall be installed at all conduit terminations.
- Bell ends shall be used at all conduit terminations.
- Sweep radii shall be 24"
- Conduit runs shall have a maximum length of 150'

Conduit laid in open trench shall not be covered nor shall trench or inspection hole be backfilled until accepted by the City Engineer or his designated representative. Conduit shall be installed per SDRSD M-15 if in joint trench.

SPLICING

Splices shall be permitted in pull boxes and lighting standard bases ONLY. All splices shall be waterproof, penatrox shall be used with butt splice and adhesive lined heat shrink tubing.

CONDUCTORS AND SERVICE RUNS

All conductors shall be stranded copper, THWN, #8 AWG minimum. Neither aluminum nor direct-burial cable shall be accepted.

Wire shall conform to the applicable portion of ASTM B3 and B8. Wire size shall be indicated on the "As-Built" plans. Wire connectors shall be approved by the City Engineer or his designated

representative 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. For the 120-volt installations, the wires shall be black and white, with black being the hot wire and fused. For 240-volt installations, one hot wire shall be black and the other shall be red. Both hot wires shall be fused. Any ground wires shall be green and connected to a clamp attached to an anchor bolt.

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 five percent (5%).

HOOK-UP TO SDG&E SERVICE POINT

Contact SDG&E for a service point. SDG&E will identify what service is available and where it is located. In rare cases, a new streetlight can be connected to an existing streetlight circuit, but not without written

permission from the City Engineer. New voltage drop calculations shall be required to verify that existing circuit can handle additional load.

The service point shall be in the City's right-of-way; otherwise, the City will require an easement to the service point.

When the street light is being installed for the purposes of telecommunication use, all telecommunication equipment electrical power shall be separated from street light connections. Separate circuits will be provided and any necessary pull box will be installed, to provide a point of connection. All pull boxes shall be concrete and be ADA compliant and meet all City standards for placement within the public Right-of-Way. Electrical pull boxes being used for telecommunication facilities must be clearly identified on the box lid as "Electric". Equipment fusible disconnect must be within the equipment enclosure or within pull box. No fusible disconnect will be allowed within the pole.

Electrical connections will be metered separately from Public Street Lights. Wireless telecommunication facilities must utilize SDG&E wireless metering. If SDG&E wireless metering is not feasible, metering must be contained within available equipment enclosures and conform to the maximum dimensions of the Attached Equipment section of these standards.

ATTACHED EQUIPMENT (TELECOMMUNICATION)

Equipment attached to poles for telecommunication purposes shall meet the following criteria:

- Equipment must be enclosed within a single equipment enclosure with dimensions not exceeding 18" in width and not more than 10" in depth.
- The equipment enclosure attached to the pole cannot exceed six (6) cubic feet in volume.
- Equipment may only be mounted to the pole through the use of bands.
- Attached equipment must utilize existing pre-drilled holes within the City approved street light pole standard for all cable runs and utility connections.
- Penetrations to the public street light pole for any reason are prohibited.
- Attached equipment must be mounted as close as possible to poles leaving no more than 1" space between the pole and the mounted equipment.
- Attached equipment must have the main opening face of enclosures faced away from the street. The attached equipment will be placed 180 degrees from the mast arm in a 'backpack' configuration.
- The gross weight of all attached equipment cannot exceed 250 pounds.
- Attached equipment must be centered 15' above the base of the pole.
- The bottom of attached equipment cannot be lower than 12' above the base of the pole.
- The top of attached equipment cannot be higher than 20' from the base of the pole.
- Electrical disconnect shall be provided in an underground enclosure located adjacent to the pole.
- Equipment may not have exposed cables, conduit, or cable covers outside of the equipment enclosure.

Equipment must have a durable surface finish colored to match RAL 7003 or equal. Unfinished or galvanized finishes will not be accepted.

TELECOMMUNICATION ANTENNAS

Antennas must meet the following criteria:

- Be enclosed by a radome colored to match the street light mast arm color and be generally cylindrical in shape with tapered bottoms.
- Be mounted directly on-top of, and in-line with the street light pole. Offset or side attached configurations of antennas are prohibited.
- Radome enclosures may not exceed the diameter of the base of the public street light pole, or 11" whichever is smaller.
- Radome enclosures may not exceed 36" above the top of the public street light pole height.

- Antennas must be secured to the pole by methods which will leave the pole undamaged.
- The gross weight of the pole top antenna and associated equipment cannot exceed 200 pounds.
- Cable runs to the antennas and/or associated pole-mounted equipment must be internal to the public street pole, including any connections to underground utilities (i.e. power).
- Radome enclosures must be colored to match RAL 7003 or equal.

PRE-INSTALLATION

Obtain a City R/W permit for any work performed within a City R/W or City easement. Attached to the R/W permit are the construction requirements applicable to all work performed within the City R/W.

Call underground Service Alert at 800-422-4133 at least 48 hours before excavating.

Where a streetlight installation is being installed for the purposes of telecommunication use the following approvals must be obtained:

- **Right-of-way Permit: For work in the public right of way**
- **Building Permit: For foundation**
- **Administrative Wireless Telecommunication Facility Permit (Planning): For approval of facility.**

INSTALLATION AND INSPECTION

1. Concrete and/or asphalt removal & replacement shall be per City of San Marcos Excavation Ordinance as directed by the City. A sidewalk extension maybe required to meet ADA access requirements.
2. Conduit depth shall be as described in the CONDUIT AND TRENCH section. All trenches shall be compacted per the City of San Marcos Excavation Ordinance as directed by the City.
3. Street Lights shall be located per City approved plan or per City of San Marcos Standard Drawing ELE-1, and shall not be relocated without prior City approval.
4. Inspections will be called in a minimum of 48 hours in advance by calling (760) 744-1050.
Minimum Inspections Required:
 - a. All work performed within a Public Right-Of-Way
 - b. All conduit placement
 - c. Final wiring and splicing prior to energizing
 - d. Prior to and during any concrete foundation placement
 - e. Pole installation
 - f. Construction "As-Built" drawings shall be submitted prior to final inspection
5. Pedestrian and vehicle traffic control and access shall be maintained per the Plans, Specifications, 2012 Standard Specifications for Public Works Construction (Greenbook) subsection 7-10 (Public Convenience and Safety), MUTCD, and as otherwise required or directed by the City.

ACCEPTANCE AND ENERGIZING

1. Upon completion of all street light construction, the Contractor (on public projects) or Developer (on private development projects) shall submit two (2) sets of professionally drafted streetlight "As-Built" plans on 11" x 17" size mylar sheets to the Engineering Department, showing the following information:
 - a. Layout of curbs, gutter, sidewalks, driveways and other improvements, drawn to scale
 - b. Location of street lights, with dimensions from the nearest cross street intersection and between streetlights
 - c. Location of pull boxes dimensioned from the streetlights, curbs or other features
 - d. Location of service point (power source) and SDG&E identification number
 - e. Location of conduit service runs dimensioned from face of curb, edge of pavement or back of sidewalk as applicable
 - f. Size and type of wire used
 - g. Size (wattage and voltage rating) and type (LED) of each lamp and number of lamps used
 - h. North arrow
 - i. Contractor's name, address and telephone number
 - j. Identifying project name and number

INCOMPLETE SUBMITTALS WILL NOT BE ACCEPTED

2. For private development projects, the Developer shall submit a one-year Streetlight Energy fee for each new streetlight, paid when streetlight "As-Built" plans are submitted. The fees shall be paid in accordance with the most recent Fee Schedule. All installations shall be guaranteed for a period of one year from the date of acceptance by the City for maintenance.
3. After "As-Built" plans have been accepted by the City, the Contractor or Developer shall anticipate a minimum of five (5) working days for the City to contact SDG&E for streetlight energizing. Release of a Building Occupancy requires that streetlights be energized.

CONSTRUCTION AS-BUILT DRAWING REQUIREMENTS (STREETLIGHT INSTALLATIONS) (SEE CITY OF SAN MARCOS ELE-4 STD, DWG)

Two sets of "As-Built" drawings must be given to the Public Works Inspector before SDG&E will energize a light.

Maximum size of As-Built drawings shall be 11" x 17".

Please provide the following information in addition to As-Built Drawings:

POLE

1. Manufacture's name
2. Supplier's name and contact information
3. Material
4. Height
5. Mast Arm Length
6. Footing Type (AB)

FIXTURE

1. Manufacture's name
2. Supplier's name and contact information
3. Wattage and Voltage
4. Fuse size and type
5. Photocell manufacturer

DISTRIBUTION

1. Conduit type and size
2. Wire type and gauge
3. Pull box manufacturer
4. Service point I.D. number

AS-BUILT DRAWINGS MUST INDICATE

1. North arrow
2. Streets referenced to nearest cross street
3. Pole locations, pull box locations, conduit runs, and service point location
4. Wattage/Lamp at each pole
5. Pole's physical location in relation to corners or cul-de-sac

STREET LIGHT SPACING (APPLIES TO CITY STANDARD STREET LIGHTS ONLY, NON-STANDARD STREET LIGHTS WILL BE REVIEWED ON A PROJECT-BY-PROJECT BASIS)

1. Check plans and make sure reference is made to SMCS on cover sheet. On plan show:
 - a. Street light stationing.
 - b. Street light size (watts).

- c. Street light installation detail (Refer to CITY OF SAN MARCOS STANDARD DWG. ELE-3).
 - d. SDG&E service point and stationing. Indicate serving voltage (120v or 240v).
 - e. Street light service pull box and installation detail (Refer to CITY OF SAN MARCOS STANDARD DWG. ELE-2).
 - f. Size of conduit (2" minimum) Schedule 80 PVC.
 - g. Indicate trench depth.
 - h. Size and numbers of wires.
 - i. When laying conduits across a street, they shall be at right angles to the curb line. Conduits shall not cross the street within an intersection or the cul-de-sac turnaround area.
 - j. North arrow and scale.
 - k. Vicinity map and Thomas Brother's coordinates.
2. General note to be on all cover sheets:

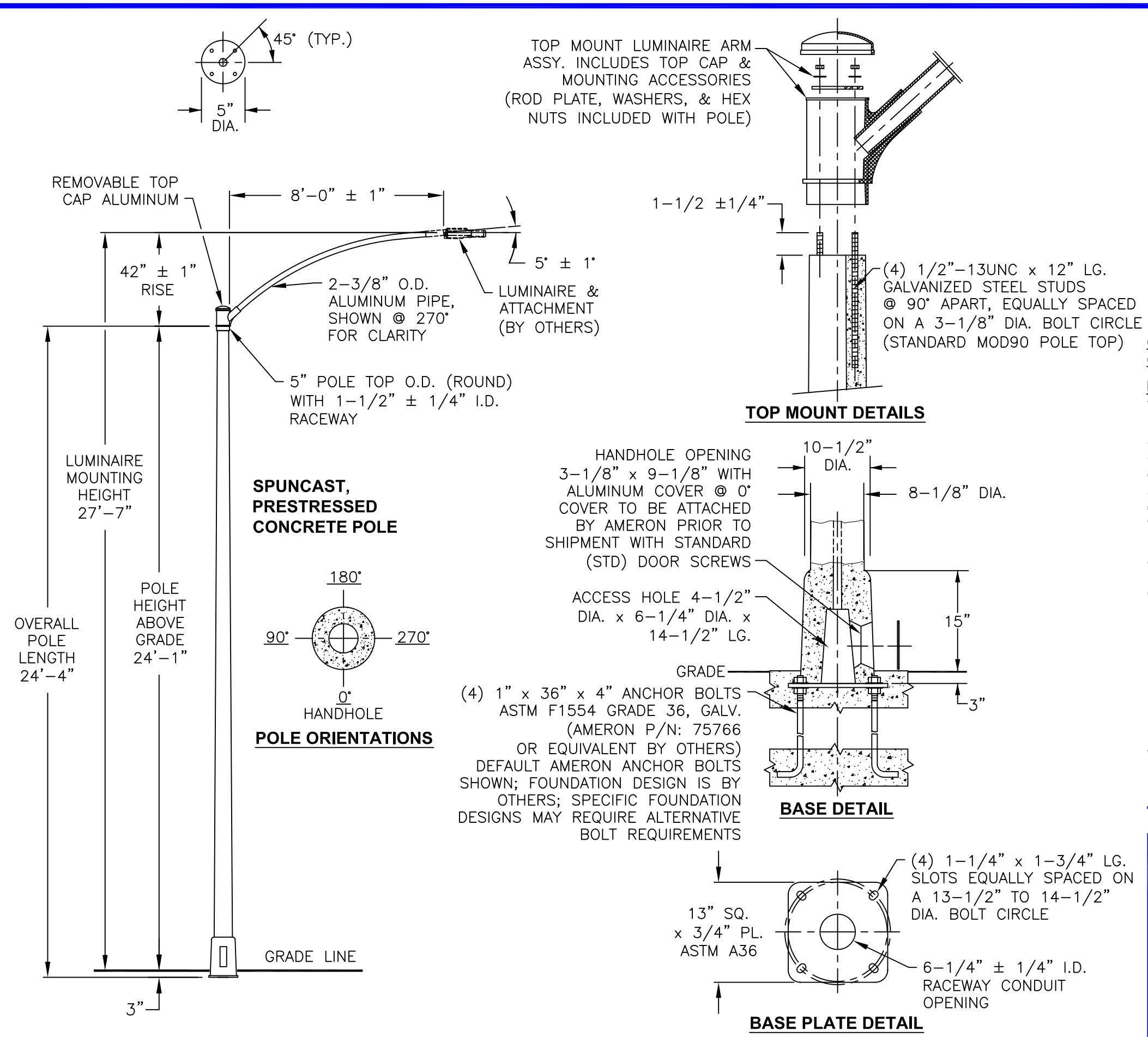
STREET LIGHT NOTE

The streetlights and service point shown hereon are approximate only. Service points are subject to revision by final SDG&E plans. It shall be sub dividers responsibility to provide the proper services to the streetlights shown on this plan according to the applicable City of San Marcos plans and specifications. The developer shall be responsible for providing conduit and conductors from the street lights to approved service points furnished by SDG&E. Conduit runs and conductor size from street lights to service points to be shown on these plans and shall be approved by the City Engineer prior to construction. Street light conduit shall be 2" minimum Schedule 80 PVC. Final location and size of street lights, conduit and wire and pull boxes shall be approved prior to beginning of construction. Install 20A fused protection for unmetered street light system.

- 3. Voltage Drop calculations are required every circuit run which has more than (2) street lights and whenever the service from the service point is more to the last (furthest) street light exceeds 500'.
- 4. The Engineer of record shall be responsible for providing final "As-Built" drawings once the lighting system is install and approved by the inspector. The construction "As-Built" drawings will be the basis for providing the final drawings. The final drawings are to be CAD drafted and shall be signed off by the engineer of record.
- 5. All non-standard City street lights shall be approved by Engineering Department.
- 6. Structural pole base calculations are required to be submitted as a supporting document when non-standard streetlights are approved for installation. Calculations shall be prepared by licensed California registered engineer and shall be wet-stamped.

OTHER NOTICES/PRECEDENCE

These specifications are not complete – it is a supplement to the latest edition of the Standard Specifications for Public Works Construction “Green Book” and the City of San Marcos Standard Special Provision. In case of conflict with the Green Book or City of San Marcos Standard Special Provisions, these specifications shall take precedence.



REV.	DATE	DESCRIPTION	DRN.	APPR.
A	03/12	CHANGED TO "I" COATING	T.L.	

"F" LEVEL CONFIG CODES		
OPTION CLASS	ENTRY	INFO.
COATING	I	
HH COVER	43207	
DOOR SCRS	STD	

"P" LEVEL CONFIG CODES		
OPTION CLASS	ENTRY	INFO.
MIX	37	
FINISH	3	
BASEPLATE	45198	NOTE 10
POLE TOP CON.	MOD90	

DECORATIVE BASE ROUND POLE WITH BASEPLATE

POLE DESIG-NATION	POLE HEIGHT A.G. (NOM.)	OVERALL POLE LENGTH	BOLT CIRCLE	BASE O.D.	ULTIMATE G.L. MOMENT (ft.-lbs.)	POLE WEIGHT (lbs.)
2B224	24'-1"	24'-4"	14"	11-3/4"	17,200	820

() POLES REQUIRED EACH WITH 8' ALUMINUM PIPE ARM ASSEMBLY (P/N: 2AP8A).

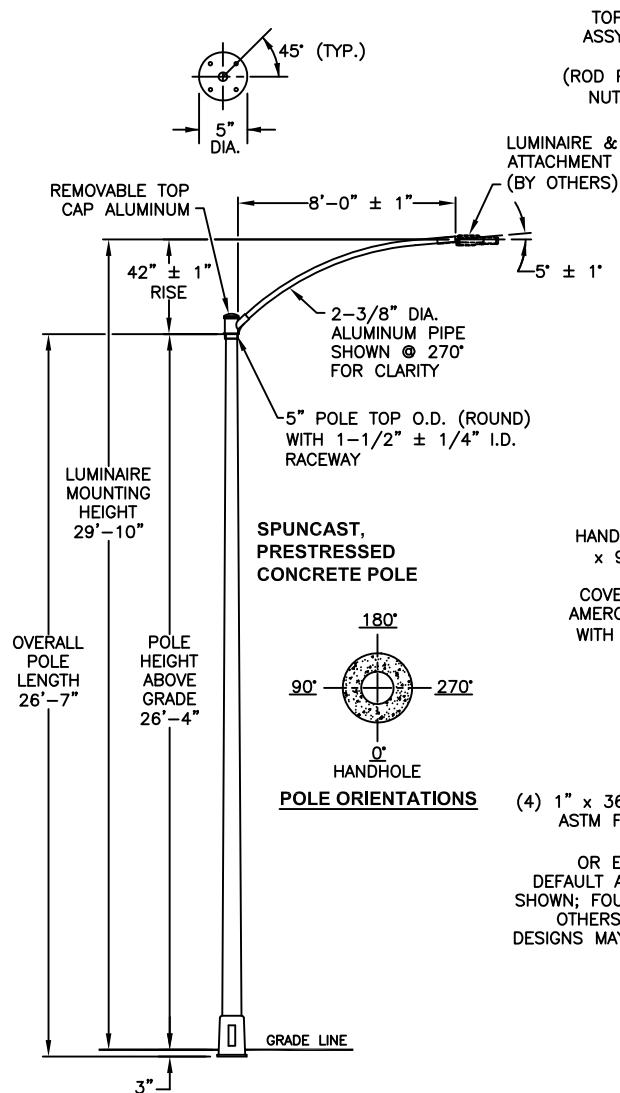
- NOTES:**
- MIX (373I): LA BLACK & WHITE, EXPOSED AGGREGATE FINISH, WITH AMERSHIELD ANTI-GRAFFITI COATING.
 - 2ASTM C-150 TYPE III GRAY CEMENT.
 - f'c @ 28 DAYS = 6,000 PSI, USING SPUN CYLINDER TEST.
 - f'c @ 28 DAYS = 5,000 PSI, USING ASTM C-31 CYLINDER TEST.
 - POLES MANUFACTURED PER ASTM C-1089-06 SPECIFICATIONS.
 - PROTECTIVE COAT EXPOSED P.C. WIRES AT POLE ENDS.
 - BASE PLATE (ASTM A-36) FULLY PRESTRESSED WITH (4) 5/16" DIA. PRESTRESSING CABLE.
 - THE ARM ASSEMBLY MAY BE ROTATED TO ANY ORIENTATION PER CUSTOMER'S REQUIREMENTS.
 - THE TOP MOUNT SINGLE 8' ALUMINUM PIPE LMA ASSEMBLY [2.5 SQ. FT. EPA, 25 LBS. (ARM & CAN COMBINED)] DEPICTED ON THIS DRAWING IS DESIGNED TO WITHSTAND THE LOADS IMPARTED BY A SINGLE BETA LEDWAY LUMINAIRE OR EQUIVALENT (NOT TO EXCEED 2.5 SQ. FT. EPA, 50 LBS.); THE POLE DEPICTED IS DESIGNED TO WITHSTAND THE LOADS IMPARTED BY THE ARM ASSEMBLY & THE SINGLE LUMINAIRE AS DESIGNED PER THE 2009 AASHTO LTS-5 USING A 90MPH WIND ZONE (3-SECOND GUSTS). PLEASE ADVISE IF THE INTENDED LOADING EXCEEDS THESE VALUES.
 - POLE SHOWN IS SUITABLE FOR CAPPED BASEPLATE (ENCASED IN CONCRETE), OTHERWISE, OTHER NON-CAPPED INSTALLATION REQUIRES A GALVANIZED BASEPLATE.

APPROVED BYDATE

CITY OF SAN MARCOS STANDARD -- SAN MARCOS, CA
2B224 POLES WITH SINGLE 8' ALUMINUM ARM ASSEMBLY

THIS DOCUMENT CONTAINS INFORMATION WHICH IS PROPRIETARY TO NOV AMERON. IT SHALL NOT BE REPRODUCED, USED OR DISCLOSED TO ANYONE WITHOUT THE PRIOR WRITTEN PERMISSION OF NOV AMERON.

DRAWN: T.L.	03/12	SCALE N.T.S.	DWG. NO. 1203-036	REV A
CHK'D:				



TOP MOUNT LUMINAIRE ARM ASSY. INCLUDES TOP CAP & MOUNTING ACCESSORIES (ROD PLATE, WASHERS, & HEX NUTS INCLUDED WITH POLE)

LUMINAIRE & ATTACHMENT (BY OTHERS)

1-1/2" ± 1/4" STUD EXTENSION

(STANDARD MOD90 POLE TOP)
(4) 1/2"-13UNC x 12" LG. GALV. STEEL STUDS EQUALLY SPACED @ 90° APART ON A 3-1/8" DIA. BOLT CIRCLE

TOP MOUNT DETAILS

HANDHOLE OPENING 3-1/8" x 9-1/8" WITH ALUMINUM COVER @ 0° COVER TO BE ATTACHED BY AMERON PRIOR TO SHIPMENT WITH STANDARD (STD) DOOR SCREWS

ACCESS HOLE 4-1/2" DIA. x 6-1/4" DIA. x 14-1/2" LG.

(4) 1" x 36" x 4" ANCHOR BOLTS ASTM F1554 GRADE 36, GALV. (AMERON P/N: 75766 OR EQUIVALENT BY OTHERS) DEFAULT AMERON ANCHOR BOLTS SHOWN; FOUNDATION DESIGN IS BY OTHERS; SPECIFIC FOUNDATION DESIGNS MAY REQUIRE ALTERNATIVE BOLT REQUIREMENTS

BASE DETAIL

(4) 1-1/4" x 1-3/4" LG. SLOTS EQUALLY SPACED ON A 13-1/2" TO 14-1/2" DIA. BOLT CIRCLE

13" SQ. x 3/4" PL ASTM A36

6-1/4" ± 1/4" I.D. RACEWAY CONDUIT OPENING

BASE PLATE DETAIL

REV.	DATE	DESCRIPTION	DRN.	APPR.
A	03/12	CHANGED TO "I" COATING	T.L.	

"F" LEVEL CONFIG CODES			"P" LEVEL CONFIG CODES		
OPTION CLASS	ENTRY	INFO.	OPTION CLASS	ENTRY	INFO.
COATING	I		MIX	37	
HH COVER	43207		FINISH	3	
DOOR SCRS	STD		BASEPLATE	45198	NOTE 10
			POLE TOP CON.	MOD90	

DECORATIVE BASE ROUND POLE WITH BASEPLATE

POLE DESIGNATION	POLE HEIGHT A.G. (NOM.)	OVERALL POLE LENGTH	BOLT CIRCLE	BASE O.D.	ULTIMATE G.L. MOMENT (ft.-lbs.)	POLE WEIGHT (lbs.)
2B226	26'-4"	26'-7"	14"	11-3/4"	17,800	900

() POLES REQUIRED EACH WITH 8' ALUMINUM PIPE ARM ASSEMBLY (P/N: 2AP8A).

NOTES:

- MIX (373I): LA BLACK & WHITE, EXPOSED AGGREGATE FINISH, WITH AMERSHIELD ANTI-GRAFFITI COATING.
- ASTM C-150 TYPE III GRAY CEMENT.
- f'c @ 28 DAYS = 6,000 PSI, USING SPUN CYLINDER TEST.
- f'c @ 28 DAYS = 5,000 PSI, USING ASTM C-31 CYLINDER TEST.
- POLES MANUFACTURED PER ASTM C-1089-06 SPECIFICATIONS.
- PROTECTIVE COAT EXPOSED P.C. WIRES AT POLE ENDS.
- BASEPLATE PRESTRESSED WITH (4) 5/16" DIA. A-416 (7 STRAND) CABLES.
- THE ARM ASSEMBLY MAY BE ROTATED TO ANY ORIENTATION PER CUSTOMER'S REQUIREMENTS.
- THE TOP MOUNT SINGLE ALUMINUM PIPE LMA ASSEMBLY [NOT TO EXCEED 8' LENGTH, 2.5 SQ. FT. EPA, 25 LBS. (ARM & CAN COMBINED)] DEPICTED ON THIS DRAWING IS DESIGNED TO WITHSTAND THE LOADS IMPARTED BY A SINGLE ARM-END TYPE LUMINAIRE (NOT TO EXCEED 2.5 SQ. FT. EPA, 50 LBS.); THE POLE DEPICTED IS DESIGNED TO WITHSTAND THE LOADS IMPARTED BY THE ARM ASSEMBLY & THE SINGLE LUMINAIRE AS DESIGNED PER THE 2009 AASHTO LTS-5 USING A 90MPH WIND ZONE (3-SECOND GUSTS). PLEASE ADVISE IF THE INTENDED LOADING EXCEEDS THESE VALUES.
- POLE SHOWN IS SUITABLE FOR CAPPED BASEPLATE (ENCASED IN CONCRETE), OTHERWISE, OTHER NON-CAPPED INSTALLATION REQUIRES A GALVANIZED BASEPLATE.

APPROVED BY

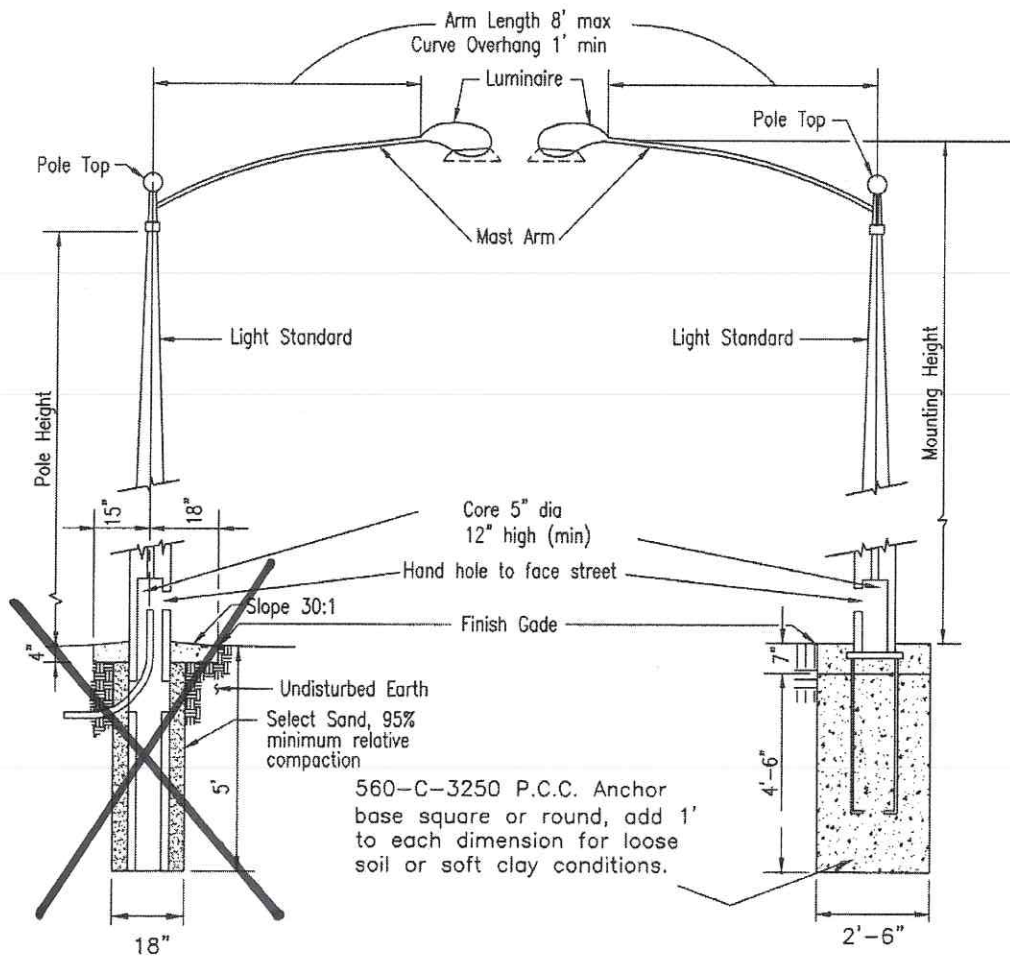
DATE

NOV Ameron Pole Products

**CITY OF SAN MARCOS STANDARD -- SAN MARCOS, CA
2B226 POLES WITH SINGLE 8' ALUMINUM ARM ASSEMBLY**

THIS DOCUMENT CONTAINS INFORMATION WHICH IS PROPRIETARY TO NOV AMERON. IT SHALL NOT BE REPRODUCED, USED OR DISCLOSED TO ANYONE WITHOUT THE PRIOR WRITTEN PERMISSION OF NOV AMERON.

DRAWN: T.L.	03/12	SCALE	DWG. NO.	REV
CHK'D:		N.T.S.	1203-037	A

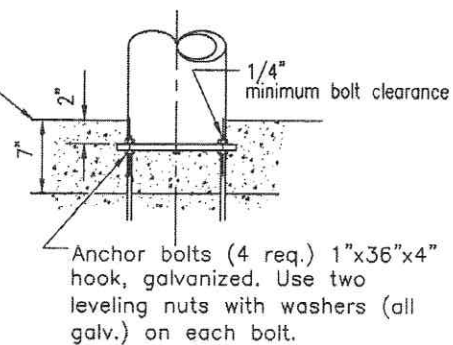


~~DIRECT BURIAL FOUNDATION~~

POLE HEIGHT	MOUNTING HEIGHT	LAMP SIZE (WATTS)
25' ±2'	27' ±1'	170 M.V. 100 H.P.S. 90 L.P.S.
28' ±2'	30' ±1'	400 M.V. 250 H.P.S. 180 L.P.S.
23' -0"	26' -9"	70 H.P.S.
26' -6"	30' -0"	150 H.P.S.

ANCHOR BASE FOUNDATION

Finished Grade
Anchor bolts must
not protrude



Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Table		M. Bahmanian	05/86
Add Metric		T. Stanton	03/03
Reviewed		T. Stanton	04/06
Delete Metric		D. Gerschaffer	06/12

SAN DIEGO REGIONAL STANDARD DRAWING

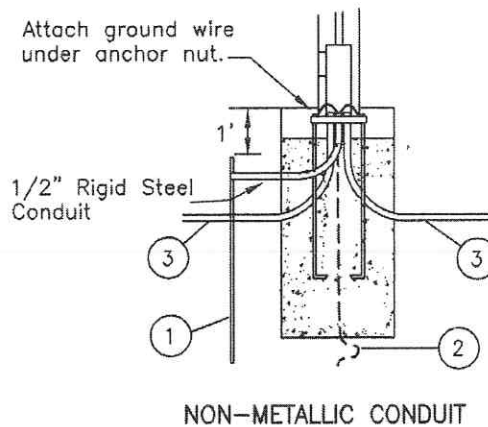
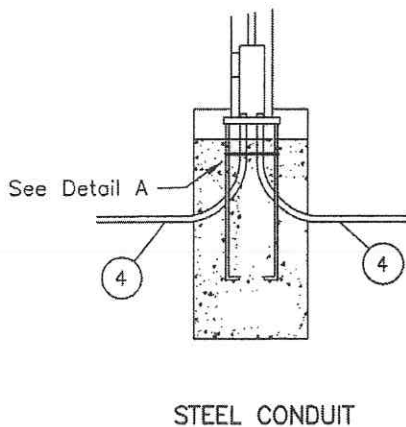
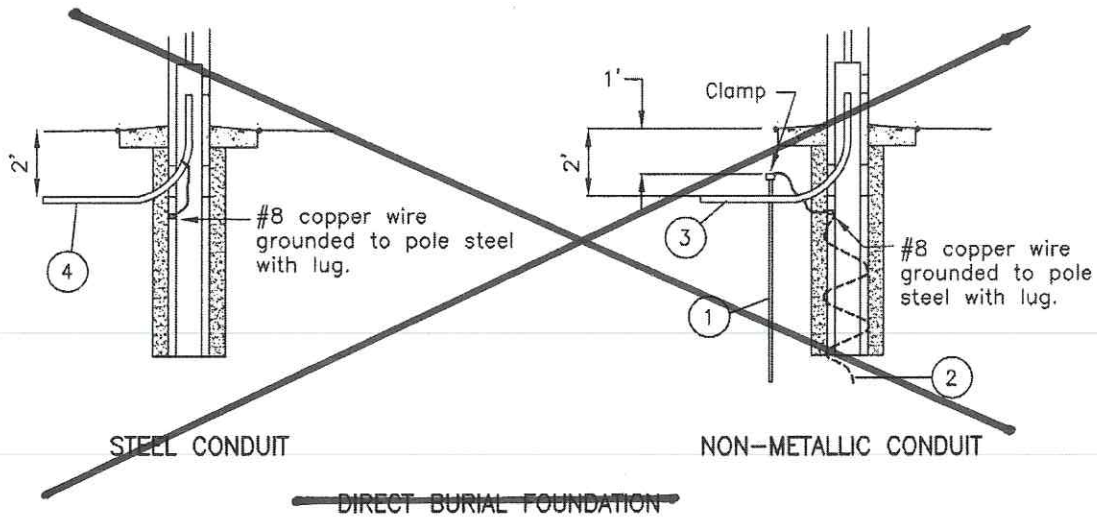
STREET LIGHTING STANDARD

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

Chairperson R.C.E. 19246 Date

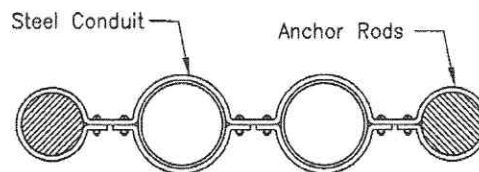
DRAWING
NUMBER

E-1



ANCHOR BASE FOUNDATION

- ① 3/4" x 8' copper covered steel ground rod.
- ② Alternate Ground: 15' no. 4 stranded copper wire, coiled.
- ③ Approved non-metallic conduit.
- ④ Steel conduit.



DETAIL A

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reformatted		T. Stanton	04/06
Delete Metric		D. Gerschaffer	06/12

SAN DIEGO REGIONAL STANDARD DRAWING

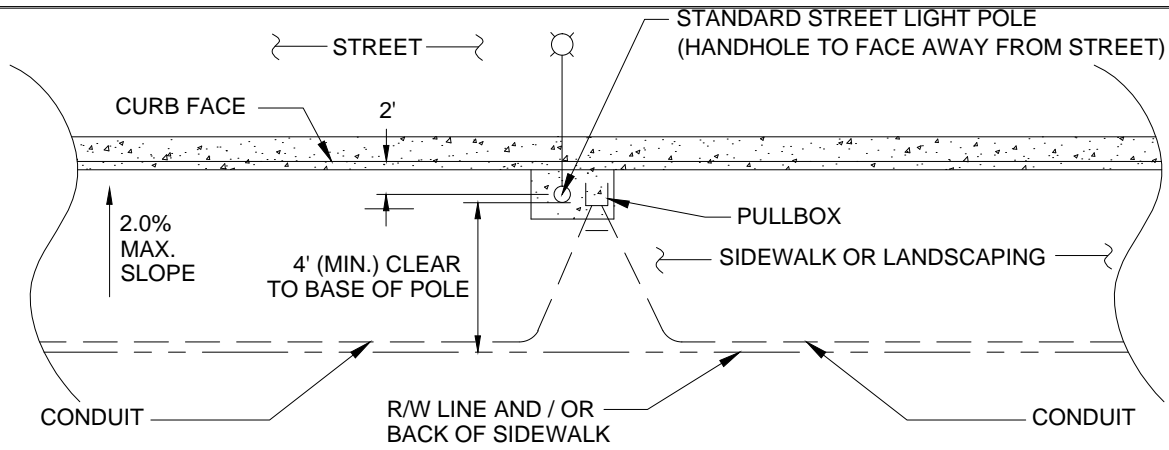
GROUNDING OF CONCRETE LIGHTING STANDARDS

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

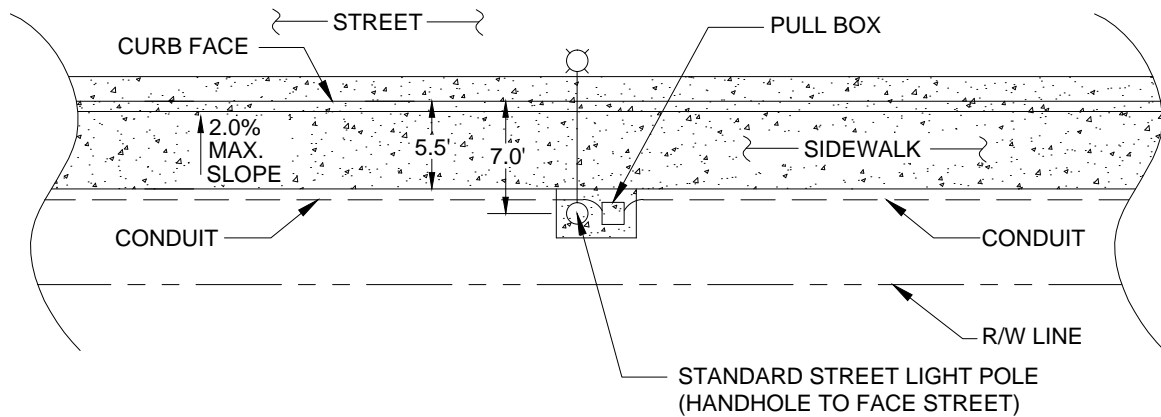
Chairperson R.C.E. 19246 Date

DRAWING
NUMBER

E-2



CASE 1: FULL WIDTH SIDEWALK OR NO SIDEWALK



CASE 2: TYPICAL 5' WIDE SIDEWALK

NOTES:

1. STREET LIGHT LOCATION MUST BE STAKED PRIOR TO TRENCHING FOR INSTALLATION OF ELECTRIC, GAS, TELEPHONE AND CABLE TELEVISION CONDUITS TO AVOID CONFLICT.
2. STREET LIGHTS SHALL BE INSTALLED PRIOR TO SIDEWALK.
3. CONCRETE CLASS AND FINISH REQUIREMENTS FOR CONCRETE PAD SHALL BE PER SDRSD NO. G-7, G-9 AND G-10.
4. MODIFY IRRIGATION APPURTENANCES AS NECESSARY TO AVOID CONFLICT WITH STREET LIGHT, PULL BOX, CONCRETE PAD AND CONDUIT LOCATION.
5. STREET LIGHTS SHALL BE PLACED AT EVENLY SPACED INTERVALS PER THE TABLE BELOW OR AS APPROVED BY THE CITY ENGINEER.

LEGEND

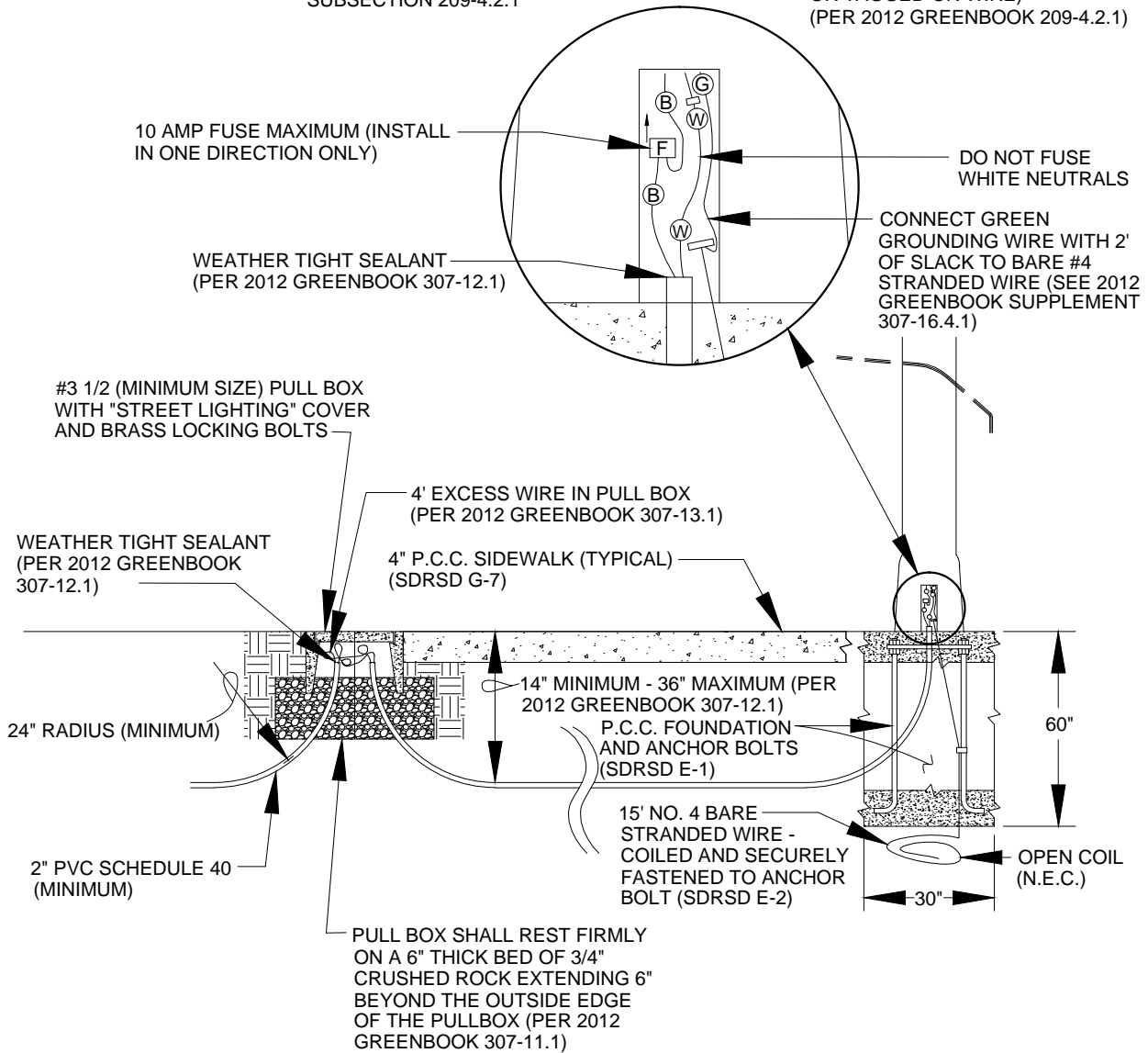


Revision	By	Apprvd	Date	CITY OF SAN MARCOS STANDARD DRAWING	
				STREET LIGHT TYPE AND LOCATION	
				DRAWING NUMBER:	ELE-1

120 VOLT SYSTEM

NOTE: STREET LIGHT WIRE INSULATION
MARKINGS SHALL BE PER 2012 GREENBOOK
SUBSECTION 209-4.2.1

WIRE SIZE: AWG 8 THWN
FEEDERS (POLE ONLY)
(SIZE SHALL BE PRINTED
OR TAGGED ON WIRE)
(PER 2012 GREENBOOK 209-4.2.1)

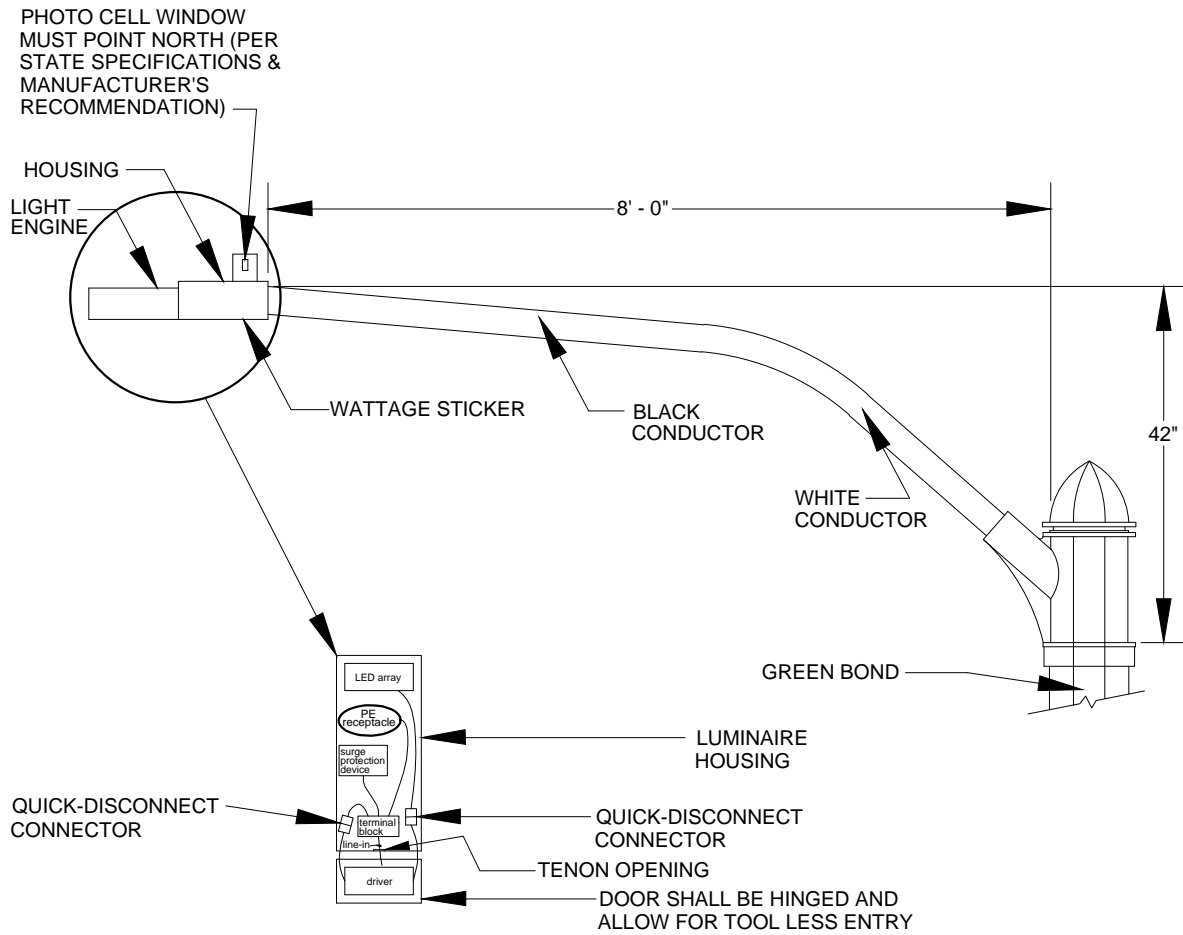


LEGEND



Revision	By	Apprvd	Date	CITY OF SAN MARCOS STANDARD DRAWING	
				STREET LIGHT SERVICE PULLBOX AND INSTALLATION DETAIL	
					DRAWING NUMBER: ELE-2

120 VOLT SYSTEM



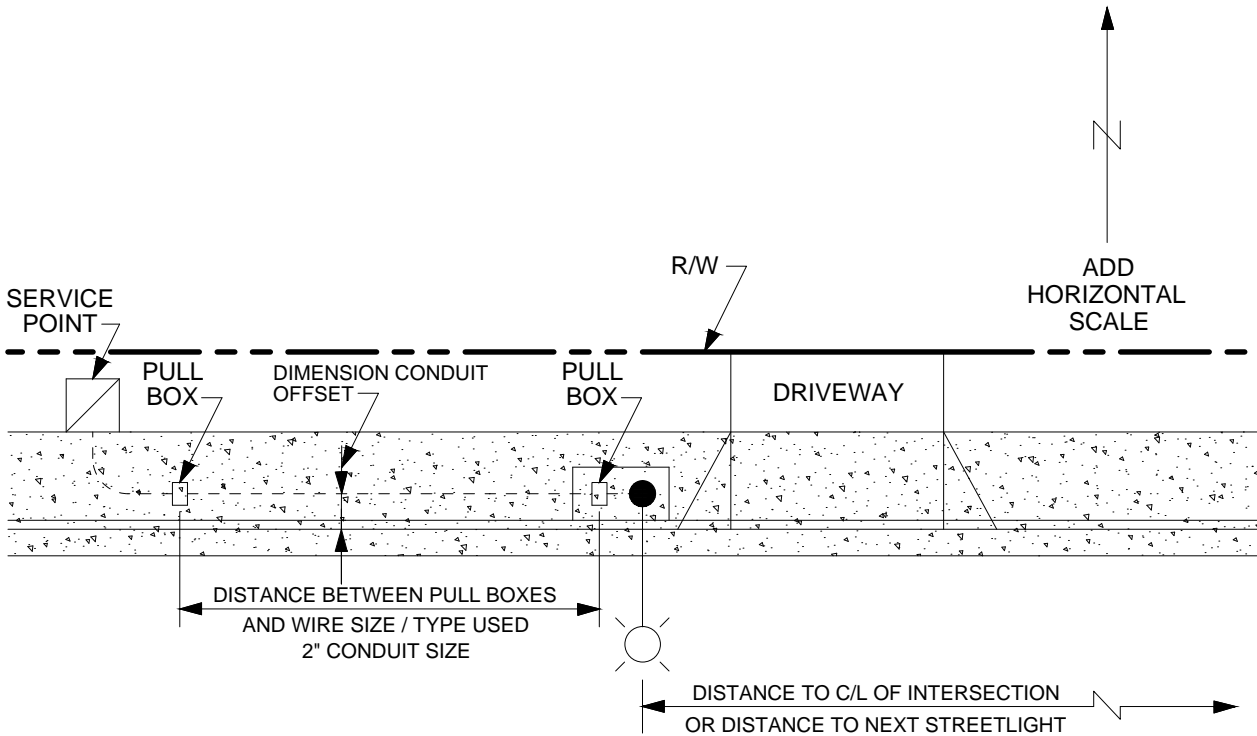
LEGEND



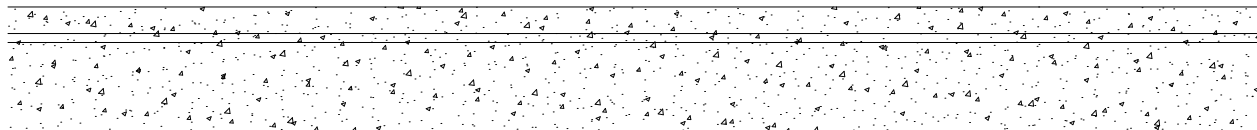
Revision	By	Apprvd	Date	CITY OF SAN MARCOS STANDARD DRAWING	
				STREET LIGHT INSTALLATION DETAIL	
				DRAWING NUMBER:	ELE-3

CITY OF SAN MARCOS - STREET LIGHT SPECIFICATIONS

SAMPLE STREETLIGHT "AS-BUILT" PLAN



STREET NAME



STREETLIGHT "AS-BUILT" PLAN FOR [LOCATION / PROJECT #]

INCLUDE STREETLIGHT LINE VOLTAGE, FIXTURE WATTAGE, FIXTURE MANUFACTURER, POLE MANUFACTURER, POLE TYPE AND MODEL NUMBER.

INCLUDE CONTRACTOR'S NAME, ADDRESS AND TELEPHONE NUMBER (INCLUDING AREA CODE)

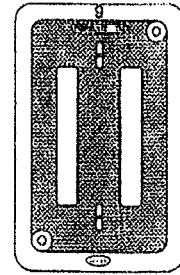
Revision	By	Apprvd	Date	CITY OF SAN MARCOS STANDARD DRAWING	
				STREET LIGHT "AS-BUILT" PLAN	
				DRAWING NUMBER: ELE-4	

- Etched polypropylene face
- Face anchored in concrete
- Ultra-violet inhibitor
- Exceeds ASTM-D1693 Standards for Environmental Stress Cracking Resistance
- Meets Caltrans #3 1/2 State Specifications

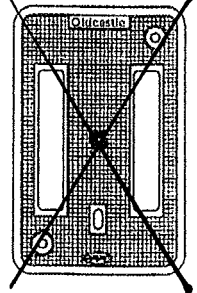
**R-Series Composite Lid
No. N09R
20 lbs.**

Cast-In Bolt
Down Bracket

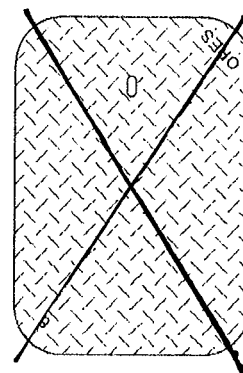
N90 Clip, For
Bolt Down
Application



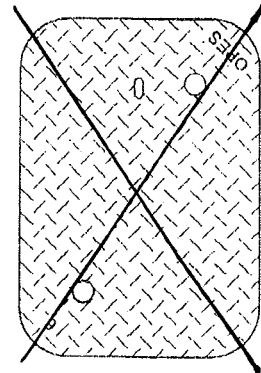
FL09T



N09J

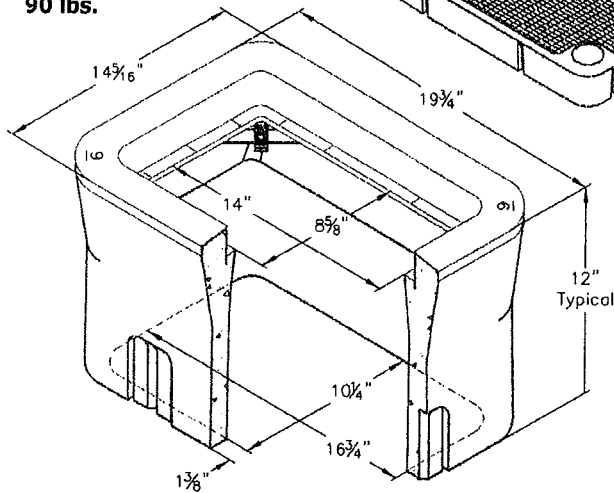


B09-61D



N09-61J

**Electrical Box
No. N09 BOX
90 lbs.**



A high density reinforced concrete box with non-settling shoulders positioned to maintain grade and facilitate back filling. Approximate dimensions and weight shown.

Oldcastle Ordering Code	Item	Approx. Shipping Weight	Description
N09BOX	BOX	90 lbs.	N09 Electrical Box (10 1/4" x 16 3/4") - Meets #3-1/2 State Specifications - 28 per pallet
N09R	LID	20 lbs.	R-Series Composite Lid with Polypropylene Ring (Order N90 Bolt Down Kit Separately)
FL09T	LID	5 lbs.	Fibrelyte Lid, Non-Concrete, Bolt Down (Order N90 Bolt Down Kit Separately)
N09J	LID	22 lbs.	Cast Iron Lid Bolt Down, (Order N90 Bolt Down Kit Separately)
B09-61D	COVER	22 lbs.	Steel Checker Plate Cover
N09-61J	COVER	22 lbs.	Steel Checker Plate Cover, Bolt Down (Order N90 Bolt Down Kit Separately)
B09X12	EXTENSION	87 lbs.	12" Reinforced Concrete Box Extension - 28 per pallet
B09SL	SLAB	32 lbs.	Reinforced Concrete Slab (13 1/4" x 19 3/4")

Galvanizing available on all steel covers.



Oldcastle Precast®
Enclosure Solutions

Phone: (800) 486-7070 Fax: (800) 486-6804
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N09 BOX

FILE NAME: N09_ISO

ISSUE DATE: January, 2011

www.oldcastleprecast.com

**N09 ELECTRICAL BOX
10-1/4" x 16-3/4"**

