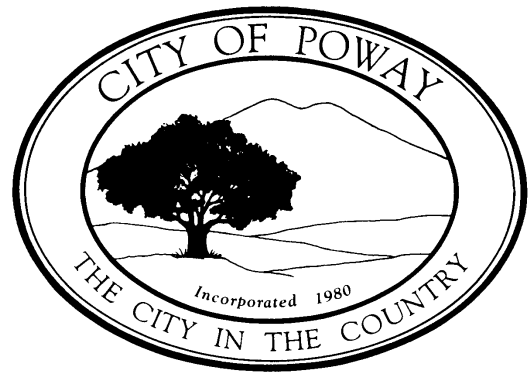


Section 2

Engineering Supplements



Technical Specifications Supplement To the “2015 Green Book”

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PART 2 CONSTRUCTION MATERIALS

SECTION 200 – ROCK MATERIALS

200-2 UNTREATED BASE MATERIALS.

200-2.1 General. (Delete and replace with the following):

Any base material used for the project work shall be Crushed Aggregate Base per Section 200-2.2 Crushed Aggregate Base, or Crushed Miscellaneous Base per section 200-2.4.

SECTION 202 - MASONRY MATERIALS

202-3 MORTAR, GROUT, AND WATER.

202-3.1 Mortar. (Add the following):

Hydrated lime shall conform to Specifications for Hydrated Lime for Masonry Purposes, ASTM C207.

SECTION 203 – BITUMINOUS MATERIALS

203-1 PAVING ASPHALT.

203-1.2 Testing Requirements. (Add the following):

The paving asphalt for this project shall be PG 64-10.

203-1.1 General. (Add the following)

The Contractor shall furnish the Engineer, at least two (2) weeks prior to the start of work, with a list of material sources together with Certificates of Compliance, indicating that materials to be incorporated in the work fulfill the requirements of these Specifications. The Certificates of Compliance shall be signed by the material supplier or representative. The Engineer may permit the use of paving materials, aggregate, anti-strip agents, asphalt, or any combination thereof prior to sampling and testing when accompanied by a Certificate of Compliance.

203-6 ASPHALT CONCRETE.

203-6.1 General. (Add the following):

Asphalt shall contain a maximum Recycled Asphalt Pavement (RAP) of 20%.

The Contractor shall furnish the Engineer, at least two (2) weeks prior to the start of work, with a list of material sources together with Certificates of Compliance, indicating that materials to be incorporated in the work fulfill the requirements of these Specifications. The Certificates of

Compliance shall be signed by the material supplier or representative. The Engineer may permit the use of paving materials, aggregate, anti-strip agents, asphalt, or any combination thereof prior to sampling and testing when accompanied by a Certificate of Compliance.

203-6.4 Asphalt Concrete Mixtures.

203-6.4.1 Class and Grade. (Delete this section and replace with the following):

The class and grade of asphalt concrete mixtures shall be C2-PG 64-10-R20.

203-6.4.4 Composition and Grading. (Add the following):

The aggregate grading to be used shall be Class C-2.

For full depth paving on arterial streets, the top course shall have aggregate grading of Class C-2 and the lower course shall have aggregate grading of Class B.

The Table below shall apply to paving on Poway Road, Pomerado Road, Espola Road, Twin Peaks Road and all roads in the South Poway Business Park.

AC Section	AC Top Course Type	AC Lower Course Type
< 3"	Full Depth - C2	-
> 3"	Top 2" - C2	Remainder of Section Plus 1" Greater Than Existing - B

SECTION 207 – GRAVITY PIPE

207-17 PVC GRAVITY PIPE.

207-17.1 General. (Add the following):

Pipe shall have a minimum SDR of 35. Pipe stored at the worksite shall be protected from direct sunlight. Any pipe showing signs of fading shall be considered damaged and removed from the site.

SECTION 209 – PRESSURE PIPE

209-2 STEEL PIPE AND FITTINGS.

209-2.6 Dielectric Connections. (Add the following subsection):

Insulating bushings shall be molded "Lexan" polycarbonate insulating bushings as approved by the City.

Pipe Wrap shall be as indicated on the Standard Drawing and shall be supplied in four-inch rolls. Prior to application of the pipe wrap, the copper tubing or brass pipe, fittings, valves, or corporation stops within four feet of the main (measured horizontally) shall be thoroughly cleaned of all dirt and grease, and dried. The tape shall then be wrapped tightly around the

cleaned copper tubing or brass pipe, fittings, valves, or corporation stops. For each layer, the tape shall be lapped a minimum of 3/8 inch.

209-4 PVC PRESSURE PIPE.

209-4.2 Materials. (Add the following paragraphs):

The class of pipe shall be specified on the Plans and Specifications. All Class 150 pipe shall conform to the requirements of DR18, and Class 200 pipe shall conform to the requirements of DR14.

For 14" - 36" diameter pipes. Minimum acceptable pressure rating (PR) shall be 235 psi.

Compounds used to manufacture PVC pressure pipe fittings and couplings shall conform to the requirements of ASTM 1784.

All pipe, fittings, and couplings shall be clearly marked as follows:

1. Class of pipe

All joints shall be bell and spigot type. Provisions must be made for expansion and contraction at each joint with an elastomeric gasket. Gaskets shall conform to the requirements of ASTM F477. Bells shall be an integral wall section with a solid cross-section gasket.

Fittings shall be either PVC or ductile iron "push-on" type. PVC fittings shall conform to the requirements of Section 207-21. Ductile iron fittings shall be "push-on" type and shall conform to the requirements of ANSI A21.53 (AWWA C153) with a minimum working pressure of 350 psi. Cement lining and gaskets shall conform to ANSI A21.4 (AWWA C104) and ANSI 21.11 (AWWA-C111), respectively.

209-4.3 Protection of Materials. (Add the following subsection):

All pipe stored on site shall be covered in a manner that will protect it from direct sunlight. Any pipe showing discoloration or fading, shall be considered damaged and removed from the site.

SECTION 212 – WATER AND SEWER SYSTEM VALVES AND APPURTENANCES

212-5 VALVES.

212-5.1 Resilient Wedge Gate Valves. (Delete this section and all subsections and replace with following):

Gate Valves, unless otherwise indicated, shall be the same size as the main in which they are installed. All gate valves shall be nonrising stem counterclockwise opening. Valves shall have the same type ends as the pipe or fitting on which they are installed. Valves shall be marked with raised lettering cast on the body, indicating manufacturer and working pressure. Working pressure rating shall equal or exceed that of the pressure class of the adjoining pipe.

Three-inch and Smaller Gate Valves: The body and all interior working parts shall be constructed of ASTM B62(85-5-5-5) Copper Alloy 836 bronze--except stem shall be copper

silicon and/or copper nickel alloy and shall not contain more than 2% aluminum nor more than 5% zinc, and shall have a minimum tensile strength of at least 60,000 psi, a minimum yield strength of at least 30,000 psi, and a minimum of at least 15% elongation in 2-inches. Handwheels shall be bronze or brass. Valves shall be Jones No. 372, Ohio Brass No. 220, or City-approved equal.

Four-inch and Larger Gate Valves: Valves shall conform to all sections of AWWA C500 and the following:

Gate valves shall be iron bodied, solid copper alloy internal working parts, parallel faced, double disc bottom wedging valves. The minimum designated water working pressure shall be 200 psi for valves 4 inches through 12 inches, and 150 psi for larger valves.

Copper alloy for all internal working parts, including stems, shall not contain more than 2% aluminum or more than 5% zinc. Bronze shall be ASTM B62 (85-5-5-5) Copper Alloy 836, except that stem shall be copper silicon and/or nickel alloy and shall have a minimum tensile strength of at least 60,000 psi, a minimum yield strength of at least 30,000 psi, and a minimum of at least 15% elongation in 2 inches. All body bolts shall be stainless steel ASTM A320 Grade B8M and 8M (ASTI 316). Valves shall be equipped with operating nuts unless otherwise indicated.

Resilient-Seated Valves, unless otherwise indicated, shall be the same size as the main in which they are installed. All resilient-seated valves shall be nonrising stem, counterclockwise opening. Valves shall be marked with raised lettering cast on the body, indicating manufacturer and working pressure. Working pressure rating shall equal or exceed that of the pressure class of the adjoining pipe.

212-5.2 Butterfly Valves. (Delete this section and all subsections and replace with following):

Butterfly valves shall be tight closing, rubber seated, conforming to AWWA C504-74. Valves shall be Class 150B with a maximum working differential pressure across the disc of 150 psi and shall be City approved.

Valves 12 inches and larger shall be flanged body unless otherwise indicated on the drawings or specified elsewhere. Valves 10 inches and smaller shall be flanged body, or bell type for asbestos cement or polyvinyl chloride pipe. Flanged end (or ends) shall be provided if so indicated on the drawings. Flanged ends shall conform in dimension and drilling to ANSI B16.1 Class 125 cast iron flanges. All exterior cap screws and bolts on valve body shall be ASTM A276, Type 304 or 316 stainless steel.

Shafts may consist of straight-through one-piece shafts or may be of the "stud shaft" type. Shaft material shall be ASTM A276, Type 304 or 316 stainless steel; or carbon steel with Type 304 or 316 stainless steel journals and static seals to isolate the interior of the disc and the shaft from water.

Discs shall be cast iron conforming to ASTM A48, Class 40; ductile iron conforming to ASTM A536, Grade 65-45-12; or alloy cast iron, conforming to ASTM A436, Type 1. The valve disc shall rotate 90° from fully open to the slightly shut position.

Valve seat retention and fastening devices when furnished for rubber seats, shall be either ASTM A276, Type 304 or 316 stainless steel; or bronze containing not more than 7% zinc nor more than 2% aluminum. Where the rubber seat is applied to the disc, it shall be vulcanized to a stainless steel seat-retaining ring, which is firmly clamped to the disc by stainless steel nylon locking screw fasteners.

Operators shall be of the manual type. The operators shall be of a worm gear, rack and pinion, or traveling-nut type with adjustable stops to limit disc travel and shall be totally enclosed and self-locking. The number of turns to rotate the disc shall vary with the size, but not be less than 2 turns per inch diameter valve size through 8 inches, nor less than 30 turns on 10-inch and larger valves. The operator shall be of the size required for opening and closing the valve at its rated operating pressure for permanent installation and operation in a buried or submerged location and shall be fully gasketed, sealed, and factory packed with grease.

Operators for valves to be buried below ground level shall be equipped with standard AWWA 2-inch square operating nuts. All exterior cap screws shall be ASTM A276, Type 316 or 304 stainless steel.

Operators for valves to be located above ground level or in vaults below ground level shall have a disc position indicator and a handwheel or crank.

Adapters, when required, shall conform to the Standard Drawing for Butterfly Valve Assembly. Cast iron (ductile) adapters shall conform to the requirements of ANSI A21.10, (A21.53) AWWA C110, (AWWA C153). Flanges shall conform to ANSI B16.1, Class 125 unless otherwise specified. The thrust collar adapter (required on 12-inch valves and larger) shall have the collar integrally cast with the adapter or welded to be equal in strength to a cast collar. Interior surface of adapter fittings shall be mortar lined and seal coated in accordance with ANSI A21.4 (AWWA C-104).

Four-inch and Larger Resilient-Seated Valves: Valves shall conform to all sections of AWWA C509 and the following:

Valve bodies shall be iron bodied. The minimum designated water working pressure shall be 200 psi for valves 4 inches through 12 inches, and 150 psi for larger valves.

Copper alloy for internal bronze parts, including stem, shall not contain more than 2% aluminum or more than 5% zinc. Bronze shall be ASTM B62 (85-5-5-5) copper alloy 836, except that stem shall be copper silicon and/or nickel alloy and shall have a minimum yield strength of at least 60,000 psi, a minimum yield strength of at least 30,000 psi, and a minimum of at least 15% elongation in 2 inches. All body bolts shall be stainless steel ASTM A320 Grade B8M and 8M (AISI 316). All valve body interior metal surfaces shall be 12 mil epoxy coated. Valves shall be equipped with operating nuts unless otherwise indicated.

Valve Boxes: The lower valve box shall be 6" diameter pipe of material acceptable to the City of Poway.

Untraveled Areas - The upper valve box sleeve shall be a 6" ABS or sewer pipe. Valve box covers shall be painted white with 2 coats of traffic marking type paint.

Traveled Areas - The valve box and cover shall be SBF 1208.

A concrete ring shall be provided to support upper valve box and cover.

Valve Stem Extensions: Where valve operator nut is 5 feet or more below top of valve box, a galvanized steel extension shall be provided.

212-5.6 Air Release, Air/Vacuum, and Combination Air Valves. (Delete this section and all subsections and replace with following):

No hydrants are to be used as blow-off assemblies.

Pipe Sleeves and Covers: The steel pipe sleeves shall be C-900 PVC pipe. Valve boxes and covers shall be seated flush with the paved surface of the natural ground or paved surface. The topside of the cover shall be painted with two coats of traffic type paint.

Angle Valves shall have bronze bodies conforming to ASTM B62, Copper Alloy 836, rates for 300 psi W.O.B., and brass or bronze handwheel. Discs shall be composition. Stems shall be copper silicon and/or copper nickel alloy. Valve manufacturer shall either guarantee the stem against dezincification for the life of the valve, or shall certify that the stem contains not more than 2% aluminum or more than 5% zinc.

212-6 HYDRANTS. (Delete this section and all subsections and replace with following):

212-6.1 Fire Hydrants.

Bodies shall be cast-bronze with a minimum working pressure rating of 150 psi and shall equal or exceed AWWA C503. Base shall be drilled for six bolts except when 8-hole drilling is specified or shown on the plans. Stems shall have "O" ring packings. Plastic protector caps and chains with fasteners shall be supplied for all outlets. All hose outlets shall have "National Standard Hose Threads" (NFPA Handbook - American National Standard Fire Hose Coupling Screw Threads).

Two-way hydrants shall be provided at all locations where fire hydrants are indicated, unless otherwise shown on the Plans or specified herein. In commercial, industrial, and high-density residential zoned areas, three-way hydrants shall be provided.

Two-way hydrants shall consist of one 2 ½-inch and one 4-inch hose outlets, steamer type.

NOTE: Three-way hydrants with two 2 ½-inch outlets and one 4-inch outlet may be used in commercial areas with the approval of the Fire Marshall.

Three-way hydrants shall consist of one 2 ½-inch and two 4-inch hose outlets, steamer type.

Hydrant Buries shall be heavy cast iron, designed for use at a normal operating pressure of 200 psi, and shall be 6-inch diameter with 6-inch inlet bell and 24-inch or 30-inch flanged riser, consistent with spool and head flange drillings. Bury extensions shall be flanged and of similar design and construction. The interior surfaces of all buries shall be lined with 5/16-inch cement mortar. Exteriors shall be coated with asphalt varnish.

Scored Spools shall be cast iron, flanged both ends. The interior surfaces of all spools shall be lined with 5/16-inch cement mortar. Exteriors shall be coated with asphalt varnish. Spools 12 inches and longer shall be scored on both ends, 3 inches from face of flanges. Spools less

than 12 inches long shall be scored in the middle. The score shall be a V-groove, 1/4-inch wide, and from 1/8-inch minimum to 3/16 inch deep. The face of the flange shall be at least 4 inches, and more than 8 inches above the splash pad. Where there is no concrete curb, the elevation of the top of the spool shall be determined by the City's representative.

Nuts and Bolts for cast-iron fittings shall be stainless steel. ASTM A320, Grade B8M and BM (AISI 316).

212-10 SERVICE LATERALS, METERS, AND METER BOXES.

212-10.1 Copper Tubing. (Replace the first paragraph with the following):

Copper tubing for air and vacuum valves, manual air release, blow-off valves, backflow prevention for sprinkler systems, and water service assemblies shall conform to the requirements of ASTM B88, Type "K". All tubing shall be soft (annealed). Flare fittings shall consist of bronze threaded fittings with flare seat, and bronze companion flare tailpiece. Flared fittings shall conform to ANSI B16.26. or G70.1. Copper tubing bends shall be made with wrought copper solder fittings, conforming to ANSI B16.18 or B16.22. Solder shall be high grade silver solder (15' grade) intended for use in high pressure copper tube water lines.

212-10.7 Brass Pipe. (Add the following subsection):

Brass pipe shall be red brass, threaded, conforming to ASTM B43, regular. Fittings for use with brass pipe shall be cast bronze, threaded, 125 pound, conforming to ANSI B16.15.

212-10.8 General. (Add the following subsection):

All nuts and bolts used for fastening any pipe and/or appurtenances to the water system shall be standard hexagonal head machine bolts and hexagonal nuts conforming to ASTM A307, Grade B, except all buried valves, which shall be jointed to connecting pipe or adapter with ASTM A320 (Grade B8M and M [AISI 316]) stainless steel nuts and bolts. All bolt threads shall be lubricated with graphite or oil prior to installation.

212-13 SEWER MANHOLES. (Add the following section):

212-13.1 General.

Maximum spacing of sewer manholes shall be per the following table.

PIPE SLOPE	MAXIMUM DISTANCE BETWEEN MANHOLES (FEET)
3% OR LESS	300
> 3% - 5%	240
> 5% - 7%	180
> 7% - 9%	140
> 9%	100

SECTION 215 – STREET NAME SIGNS

(Add the following section):

215-1 PROPOSED SIGNS.

215-1.1 General.

The street name sign shall comply with Section 2D.43 of the latest edition of the California Manual on Uniform Traffic Control Devices (MUTCD). Contractor must call the Department of Public Works for new signs to match color and finish details unless otherwise instructed by the City Engineer.

The lettering names of streets on Street Name signs shall be composed of a combination of lower-upper case letters with initial upper-case letters. The street name suffix abbreviations are as follows:

Avenue = Ave	Court = Ct
Drive = Dr	Lane = Ln
Place = Pl	Road = Rd
Street = St	Terrace = Ter
Trail = Trail	Way = Way

215-1.2 Finish.

Signs are to be 0.08” High Intensity Prismatic Reflective Extruded Aluminum double sided and meet ASTM D4956 Type IV retro-reflective sheeting standards. Signs shall be 9” minimum tall BROWN.

215-1.3 Color.

The finished color coat shall be BROWN.

215-1.4 Legend.

Sign lettering shall be 6” minimum “C” font upper-lower case in accordance with Section 2D.43 “Street Name Signs (D3-1 or D3-1a)” of the latest edition of the California MUTCD. A City logo, 5” wide and 3-1/2” high to be on left side of street name. A 3/4” high “CITY OF POWAY” legend shall be above the City logo. Graphics shall be either printed with translucent inks applied vinyl graphics or opaque and translucent film.

215-1.5 Mounting Hardware.

2 NPC2.5	Post Cap 2-1/2” I.D.
2 NPC1	Cross Saddles
2NB20.5	Bolt, 20-1/2” x 5/8” with Nut and Washer (Galvanized)

215-1.6 Post.

All posts shall be break-away and meet the following manufacturing requirements:

Steel posts shall conform to the requirements for ASTM A570, Grade 50, for hot rolled carbon sheet steel, structural quality. Yield strength after cold-forming is 60,000 psi minimum. The cross-section of the post shall be square tube form of 14-gauge steel, carefully rolled to size and shall be welded directly in the corner by high frequency resistance welding and externally scarfed to agree with corner radii.

Sign posts shall be manufactured from hot-dipped galvanized steel conforming to ASTM A653, G90, Structural Quality, Grade 50, Class 1. The corner weld is zinc coated after scarfing operation. The steel is also coated with a chromate conversion and a clear organic polymer topcoat. Both the interior and the exterior of the post shall be galvanized.

Posts shall be ten (10) feet in length, with a 1/4" tolerance, and be perforated with the following cross-section: 2" x 2", 14 gauge, 1.99 lbs/foot. Outside corner radius shall be 5/32". Holes shall be 7/16 inches in diameter on one (1) inch centers on all four sides down the entire length of the post. Holes shall be on centerline of each side in true alignment and opposite each other directly and diagonally.

Finished posts shall be straight and have a smooth, uniform finish. It shall be possible to telescope consecutive sizes of square tubes freely and for not less than ten feet of their length without the necessity of matching any particular face to any other face. All holes and ends shall be free from burrs and ends shall be cut square.

The following tolerances shall apply:

Length	±1/4"
Hole Diameter	±1/64"
Nominal Outside Dimensions	±0.008"
Variation in Wall Thickness	±0.008"
Convexity and Concavity	±0.010", determined at the corner
Squareness	±0.012", sample shall fail if its sides are not 90° to each other within the squareness tolerance
Twist Permissible in 3' length	0.062"
Straightness in 3' length	1/16"
Corner Radii	±1/64"

PART 3 CONSTRUCTION METHODS

SECTION 300 - EARTHWORK

300-2 UNCLASSIFIED EXCAVATION.

300-2.3 Overshooting. (Add the following):

Blasting: Blasting for excavation will be permitted only after securing approval of the City Engineer, and only when proper precautions are taken for the protection of persons and property. The hours of blasting will be fixed by the City Engineer. Any damage by blasting shall be repaired by the contractor at his expense. The contractor's methods of blasting and procedure shall conform to State laws and local ordinances. Precautions should be taken to post signs warning operators of radio equipment to stop transmitting in any area in which blasting operations are in progress. The contractor shall also obtain permission from the Poway Fire Department prior to commencing blasting operations.

SECTION 302 - ROADWAY SURFACING

302-5 ASPHALT CONCRETE PAVEMENT.

302-5.1 General. (Add the following):

Contractor shall complete the following Asphalt Concrete Quality Control Plan prior to the pre-construction meeting.

ASPHALT QUALITY CONTROL PLAN			
Scope			
Overlay	Deep Patch Repairs	Mill and Fill	
Utilities Raise to Grade	Map of streets	Striping	
General Project Requirements			
Special Street Requirements			
Work Time Restrictions			
Special Traffic Control Requirements			
Storm Water Requirements			
Mix Design			
Requirements for Additives		Special Test on Materials	
Set time Requirements			
Materials			
Additives			
RAP %			
Aggregate			
How old in the mix design aggregate sample? (s)		Gradation (review fines for surface area differences) (s)	
Absorption (is the aggregate expected to absorb a lot of the emulsion) (s)		When was the last Asphalt test last completed	
Batch Plant QC/QA Plan			

Materials on Site			
De-Bonding Agent (s)		Tack (s)	
Diesel		AC Delivered without Segregation	
Material Tickets			
Storm Water BMP's			
Inlet Protection	Under all Equipment		
Equipment			
Screed Heater		RTR Tire Pressure	Tack Truck Calibration
Screed Vibrator		Finish Roller Drum	
Screed Straight		10' Straight Edge	
Roller Vibrator		Roll on Boards	
Roller Drum		Rakes	
Notification			
Resident Notice Letter (s)	No Parking Signs		
Resident Door Hanger (s)			
Training			
Employee Training Manual		Industry Training Manual	

302-5.5 Distribution and Spreading. (Add the following):

The Contractor shall protect all building foundations, planters, existing curb and gutter, screens, etc., from splash, roller scrape, or over-spray.

Spraying of oils or solvents on equipment or tools while the equipment or tools are on the newly placed asphalt mat will not be permitted.

The following is a list of Best Management Practices the City's Inspector will be following during placement of the asphalt concrete.

DO NOT use diesel fuel as a release agent on tools and equipment.

DO NOT spray any release agent on tools and equipment on the newly placed mat.

RTR Tire Temperature If the RTR tire temperature cannot be kept within the required range, the contractor shall use wheel skirts to keep the wheels hot.

DO NOT trickle AC into the paver hopper.

DO NOT over rake the edge of the placed asphalt prior to rolling.

DO NOT place puddles of tack. Tack truck last calibrated shall be proven to the project inspector. Verify the tack sprayer has full triple coverage.

DO NOT let the paver hopper go empty

DO NOT pave over spillage from the AC truck

DO NOT park a roller on the mat.

Verify that all transitions are within specification.

302-5.6 Rolling.

302-5.6.2 Density and Smoothness. (Replace the 1st sentence of the 2nd paragraph with the following):

The compaction after rolling shall be 95 percent of the density obtained by ASTM Test No. D-1560 or ASSHTO T-246 "Resistance to Deformation of Bituminous Mixtures by Means of Hveem Apparatus".

SECTION 303 - CONCRETE AND MASONRY CONSTRUCTION

303-6 STAMPED CONCRETE.

(Delete entire section and replace with the following):

303-6.1 General. (Add the following):

- I. Stamped concrete pattern and color must be approved by the Planning Department before issue of right-of-way permit. Submit: 1) color sample; and 2) patterned drawing.
- II. Colored, imprinted concrete shall be bomanite or an approved equal. The concrete shall be integrally colored throughout the concrete mix.

303-6.5 Line and Grade. (Add the following subsection):

The configuration of the drive approaches shall conform to the San Diego Regional Standard Drawing G-14 for residential driveways and San Diego Regional Standards. The thickness of the concrete has been increased to 6 ½" (min.) thick. No stamped concrete shall be used for driveway approaches adjacent to concrete sidewalks. The subgrade for the drive approach must be compacted to 90% of the maximum dry density of the soil encountered.

Sidewalks shall conform to G-7 of the San Diego Regional Standard Drawings and the joint locations in the sidewalk shall conform to G-9 of San Diego Regional Standard Drawings. The thickness of the sidewalk shall be increased to 5" (min.). The subgrade of the sidewalk shall be compacted to 90% of the soil's maximum dry density.

303-6.6 Concrete Mix Design. (Add the following subsection):

The concrete shall be 560-B-3250 (minimum compressive strength of 3250 psi). Portland cement shall conform to ASTM C150, Type I, II, V depending on soil conditions. Aggregates shall conform to ASTM C33. Mixing water shall be fresh, clean, and potable.

The color of the concrete must be integral to the mix and shall comply with ASTM C309.

303-6.7 Installation. (Add the following subsection):

The surface of the stamped concrete shall be covered with a sheet of plastic or visquene before stamping so that the product would be smooth and free of nicks and pot marks. After stamping and removal of visquene, a light trowel/broom finish may be needed, as directed by the Engineer.

303-6.8 Textures. (Add the following subsection):

The depth and width of the stamped impressions in the concrete shall not exceed 3/8 inches.

SECTION 306 - UNDERGROUND CONDUIT CONSTRUCTION

306-3 TRENCH EXCAVATION.

306-3.1 General. (Add the following):

The contractor shall dispose of the water from the work in a suitable manner without damage to adjacent property. Water shall be disposed of in such a manner as not to be a menace to the public health, and shall meet N.P.D.E.S. requirements.

306-7 PREFABRICATED GRAVITY PIPE.

306-7.7 Plastic Sewer and Drainage Pipe.

306-7.7.3 Acceptance Testing. (Add the following):

All sanitary sewer lines 6 inches and larger in diameter shall be video inspected prior to their acceptance. The video inspection is to be scheduled after all air, wayne ball, and mandrel

testing has been completed. Any deficiencies found during video inspection shall be corrected by the contractor at his expense. All repairs performed will be subject to further video inspection.

For sewer mains located in streets, the roadway will have compacted subgrade in place, surrounding all sewer manholes. For sewer mains located in easements offsite of roadways, the contractor will provide a 10-foot wide graded access road with a 20-foot wide graded radius around all manholes. In all cases, the manhole frame and cover will be a minimum of 3 inches above grade, and a maximum of 12 inches above grade.

306-7.7.4 Leakage Test for Sewer Manholes. (Add the following subsection):

When air pressure test (Section 306-1.4.4) is used to test sewer mains, all manholes shall be tested by the water exfiltration method (Section 306-1.4.2). All inlets and outlets to the manhole shall be plugged to prevent leakage. The allowable leakage shall be one gallon per hour, for manholes five feet in diameter or smaller. Bolt down lids shall be required in unpaved areas.

306-8 PREFABRICATED PRESSURE PIPE.

306-8.3 Steel Pipe.

306-8.3.4 Cement Mortar Lined Steel Pipe. (Add the following subsection):

306-8.3.4.1 Field Jointing.

Rubber ring joints shall be completed in the trench. The ends of the pipe shall be thoroughly cleaned and positioned for joining. Vegetable soap solution shall be applied to the inside of the bell, and the rubber gasket snapped into the groove on the spigot end. The bell end shall be coated with cement mortar in such a manner and in sufficient quantity to completely fill the recess between the respective linings of the two joined sections of pipe. The spigot end shall then be entered into the bell end of the adjacent pipe section the distance shown on the shop drawings.

The steel jumper rod shall then be welded into place to form an electrical bond between joined pipe sections.

The outside joint recess shall be grouted with cement mortar after a fabric diaper has first been placed around the joint and tightened securely to prevent leakage while the mortar is being poured. The diaper shall be made of heavy-duty polyethylene fabric of sufficiently close weave to prevent cement loss from the mortar. The fabric shall be hemmed on each edge and shall contain a metal strap within each hem sufficiently longer than the circumference of the pipe to allow a secure attachment of the diaper to the pipe. The diaper width will depend on pipe size and design and shall be the width recommended by the manufacturer. Following installation of the diapers, the joints shall be poured and rodded from one side only until the mortar comes up to the top of the diaper on the opposite side. Approximately one hour subsequent to the pouring of the joint, the joint shall be rechecked, and if any settlement, leakage, or shrinkage has taken place, the joint shall be refilled with mortar.

The diaper shall be stripped and the joint inspected all around, repaired if necessary, and given a heavy coating of curing compound at the earliest practicable time after the mortar has hardened sufficiently. Joint mortar shall be protected from direct sunlight for at least 14 days by

covering with burlap, heavy paper, or moist backfill material. Water shall not be allowed to enter the pipe until 36 hours after placing joint mortar.

Welded Joints shall be completed in the trench. When the pipe is being laid, both the spigot and the bell ends shall be thoroughly cleaned of all foreign matter; and all protective materials shall be removed from the surfaces that are to be in contact at the joints. Just prior to joining the two ends together, each end of the pipe shall be "battered" with cement mortar in such a manner and in sufficient quantity to completely fill the space between the respective mortar linings. After the joining is completed, the pipe interior shall be swabbed to remove all excess mortar by drawing an approved type swab or squeegee through the pipe. For pipe 24 inches in nominal inside diameter and larger, a 1/2-inch recess between adjacent linings shall be provided and later pointed from the inside with cement mortar and troweled smooth.

All field welding shall conform to AWWA C206 and shall be done by experienced welders qualified in accordance with that standard.

In all hand welding, the metal shall be deposited in successive layers and the minimum number of passes or beads in the completed weld shall be as follows:

Steel Cylinder Thickness, Inches	Fillet Weld Minimum Number of Passes
Smaller than 3/16	1
3/16 and 1/4	2
5/16	3
3/8	3

Where welded joints are designated on the Plans, the pipe may be joined with rubber gaskets as specified above for rubber ring joint in lieu of slip (lap) joints. The outside recess between the bell and spigot shall then be caulked with a rod to facilitate the welding. The weld shall be continuous for the full circumference of the pipe. After the joints have been welded and have cooled, the joint shall be grouted with cement mortar in the same manner as specified for rubber ring joints.

Butt Strap Closure Joints shall be completed in the trench after the pipe has been laid to the alignment and the grade shown on the Plans. They shall be field welded to the outside of the pipe along both edges by full circumferential fillet welds or one of the edges may be shop welded and the other field welded. Welding shall be done in the same manner as specified for welded joints. The pipe coupling shall be oriented at the top of the butt strap closure for 16 inches and smaller pipe, and at both sides for large pipe to permit access for mortaring the inside of the joint. After welding and mortaring, the coupling shall be closed with a ferrous plug.

All exposed metal surfaces shall be cleaned by wire brushing.

The interior of the joints shall be filled with stiff plastic consistency cement mortar in accordance with Appendix A of AWWA C205.

Wire fabric, 2" x 4" by 13-gauge, clean and free from rust, shall be applied to the exterior of the joints so that the wire on the 2-inch spacing runs circumferentially around the pipe. The wire on the 4-inch spacing shall be crimped in such a manner that the mesh will be held 3/8 inch from the butt strap metal surface.

The mesh shall be lapped a minimum of 8 inches and shall be securely wired in position. The joint exterior shall then be coated with cement mortar to a thickness of at least 1 ½ inches over all ferrous metals.

Immediately prior to applying mortar to the interior or exterior of the joints, a cement wash shall be applied to the metal surfaces to be coated.

Flanged Joints: Steel jumper rods shall be welded to each steel flange to form an electrical bond. Where a cast iron body valve or fitting is located between two steel flanges, the jumper rod shall bridge the valve and form an electrical bond between the steel flanges. Flange faces shall be wire brushed and gaskets shall be thoroughly cleaned just prior to joining. Following the tightening of the bolts, all buried painted and bare metal surfaces including bolts, nuts, jumper rods, and companion flanges shall be cleaned by wire brushing and then washed with cement and encased in cement mortar as specified above for butt strap closure joints. Where pipe coating has been held back to facilitate bolting, the coating shall be built up to at least ½ inch greater than the required minimum coating thickness for pipe near a flange.

Following application of the mortar encasement, the joint and the adjoining sections of pipe within a distance of two pipe diameters of the joint shall be wrapped with polyethylene film in accordance with AWWA C105.

Flexible Coupling Joints shall be completed in the trench after the pipe has been laid to the alignment and grade shown on the plans. Each pipe end for a distance of 6 to 8 inches back from the end shall be thoroughly cleaned to remove oil, dirt, loose scale, rust, and other foreign matter. Flanges, gaskets, and sleeves shall then be assembled on the pipe ends in accordance with the manufacturer's recommendations. Gaskets, pipe ends, and coupling sleeve flares shall be lubricated with a vegetable soap compound to facilitate the joining. Coupling sleeves shall be accurately centered over the pipe ends and one pipe end shall touch the coupling sleeve centering stop if the coupling sleeve is so equipped.

Bolts shall be tightened to the torque recommended by the manufacturer with a torque wrench in the presence of the City's representative.

A steel jumper rod shall be placed around the coupling and welded to each steel cylinder of pipe section being joined through the coupling. It shall also be welded to the coupling itself.

All exposed couplings, bolts, nuts, and pipe metal surfaces shall be cleaned, cement mortar encased, and polyethylene wrapped as specified for flanged joints above.

Cement Mortar for encasing, buttering, pointing, and grouting shall comply with the requirements of AWWA C205.

306-8.9 Pipeline Pressure Testing, Disinfection, and Commissioning.

306-8.9.2 Hydrostatic Pressure Test.

306-8.9.2.3 Allowable Leakage. (Amend this section as follows):

L = Maximum allowable leakage in gallons for a four-hour test, for section of pipeline tested.

SECTION 310 - PAINTING

310-5 PAINTING VARIOUS SURFACES.

310.5.5 Painting Lumber.

310-5.5.1 Paint. (Delete this section and replace with the following):

Exterior wood surfaces shall receive two primer coats and two finish coats. Primer shall be two coats of white undercoat; each applied to a minimum dry film thickness of one mil.

Interior wood surfaces shall receive one primer coat and two finish coats. Primer coat shall be one coat of white undercoat applied to a minimum dry film thickness of one mil.

310-6 PAINTING MASONRY. (Add the following section):

310-6.1 General.

Masonry construction and surface preparation shall conform to Section 303-4. Masonry surfaces shall be painted as follows:

Exterior surfaces shall receive two coats of primer-sealer, and one finish coat. Interior surfaces shall receive one coat of primer-sealer, and one finish coat.

SECTION 315 - STREET NAME SIGNS. (Add the following section):

315-1 EXISTING SIGNS.

315-1.1 General.

The contractor shall be responsible for removal, salvage, and delivery of existing signs to the City Central Supply Warehouse.

Contractor shall verify if existing signs, that are to be removed, are located in concrete and/or dirt. Existing signs shall not be cut off at ground level and hole patched. For signs located in dirt areas, the contractor shall remove the pole foundation, fill hole, and re-compact. For signs located in concrete, the contractor shall remove the pole foundation, fill hole, and replace concrete panel to nearest joint, no concrete patches will be allowed.

Payment for concrete replacement shall be included in the bid line item for sign removal.

315-2 PROPOSED SIGNS.

315-2.1 General.

New signs shall be located at the southeast corner, 7 feet behind the face of curb, and at the curb return or as specified by the Engineer.

PART 7 STREET LIGHTING AND TRAFFIC SIGNAL SYSTEMS

SECTION 700- MATERIALS

700-3 COMMON COMPONENTS.

700-3.2 Anchor Bolts, Nuts, and Washers. (Delete this subsection and replace with following):

Anchor bolts shall be of the type and size as shown on Regional Standard Drawing E-1. Anchor bolts shall conform to the specifications of ASTM A-307, and shall 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 bury or embedded installation is **not** allowed.

700-3.3 Standards.

700-3.3.3 Metal Standards.

700-3.3.3.2 Steel Standards. (Add the following):

Steel poles may be used on approved or required basis only. Steel poles shall meet the criteria of the Engineer.

700-3.5 Conduit. (Delete this section and all subsections and replace with the following):

All conduit shall be 2" U.L.-approved heavy wall polyvinyl chloride (PVC Schedule 40) unless a different material or size is required by the Engineer. Conduit of larger size may be used provided that the larger size is used the entire length of the run between pull boxes. Reducing couplings shall not be used. **Conduit to be sealed at all ends.**

700-3.7 Pull Boxes. (Replace the second paragraph with the following):

State No. 3½ Pull Box (15 3/8" x 10 1/8") or equivalent shall be installed per Caltrans Standard Drawing ES-8. Pull boxes and covers shall be of concrete. Pull box covers shall be inscribed "**STREET LIGHTING.**" Covers shall be secured with 3/8-inch bolts, cap screws or studs, and nuts, which shall be of brass, stainless steel, or non-corroding material.

700-4 STREET LIGHTING SYSTEM MATERIALS.

700-4.1 Reinforced Concrete Standards.

700-4.1.1 General. (Add the following paragraphs):

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), the pole must not be stressed beyond the cracking strength. Wind loads shall be as specified in the last edition of the AASHTO standards.

The American Association of State Highway and Transportation Officials in their publication, "Standard Specification for Structural Supports for Highway Signs, Luminaries and Traffic Signals," stipulates that poles shall be of sufficient strength to support a single LPS luminaire weighing 90 pounds, 5 feet in length, with an EPA of 4 square feet in an 80 MPH wind zone.

Concrete poles shall be tapered, centrifugally cast, and pre-stressed. They will be round, black and white marble aggregate, or naturally exposed aggregate. Other colors of aggregate may be used with written approval of the Engineer; however, pole shape and color shall be uniform for any one project. Replacement poles shall match existing.

Aggregate shall conform to current requirements ASTM C33, except that abrasion requirements therein shall not apply, and no more than 7% shall pass a #100 mesh sieve. No dye or sealer shall be used without approval of the Engineer.

After exposing the aggregate, the pole shall be coated with a minimum of two coats of flat concrete sealer.

The centrifugal casting process shall produce a center duct throughout the length of the pole. This duct shall be free from sharp projections or edges that might damage the wire or cable. It shall be a minimum of 1½ inch in diameter. All reinforcing steel shall have a minimum cover of 5/8 inch of concrete.

After curing, the surface of the pole shall be treated to remove cement latency 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 inch per foot of length.

700-4.1.2 Reinforcement. (Add the following paragraphs):

Pre-stressing steel shall conform to 9 mm diameter ASTM A-421 indented wire with a minimum ultimate strength of 206,000 psi. Reinforcing bar shall conform to ASTM A-615. Wire for cage shall conform to ASTM A-82. Base plate shall conform to ASTM A-36 and shall be galvanized to ASTM A-123. Steel for luminaire arm, when required, shall conform to ASTM A-53, Grade B, and shall be fully galvanized.

The poles shall contain a minimum of 8 strands of 9 mm diameter, solid, indented pre-stressing steel wires to maintain required ultimate strength, pre-stressed to a minimum of 6600# per wire. A mild steel cage consisting of circumferential 12-gauge A-82 wire welded to 4 longitudinal 11-gauge wires at not more than a 4-inch pitch, shall encapsulate the pre-stressing steel throughout the entire length of the pole. The area of circumferential steel along any three feet of the shaft shall not be less than design. All steel shall be electrically bonded. The cover over the pre-stressing wires shall be no less than ½".

700-4.2 Wire/Conductors.

700-4.2.2 Conductors for Series Circuits. (Delete this subsection and replace with the following):

Service runs shall be of solid or stranded THW or XHHW copper wire No. 10 minimum. Voltage drop studies will be required to determine proper wire sizes. Stranded THW or XHHW copper

wire No. 10 shall be used from the fuse holder at the base of each pole to the luminaire. Copper wire shall conform to the applicable portion of ASTM B-3 and ASTM B-8. Wire connectors shall be of a type approved by the Engineer and be U.L. approved. The installation procedure, including connector size and crimping tools shall conform to the manufacturer's recommendations. Aluminum conductors will not be allowed. THHN and THWN will **not** be allowed.

700-4.2.4 Color Coding. (Add the following subsection):

700-4.2.4.1 120-Volt Circuits.

Circuits requiring 120 volts, one wire will be black and one will be white, with the black being the hot wire and fused to the pole. The ground wire from the luminaire to the grounding point in the lighting standard shall be green or bare wire.

700-4.2.4.2 240-Volt Circuits.

Circuits that require 240 volts shall have one black wire, one red wire, and one green (ground) wire. Ground wire shall be included in all new 240-volt circuits and shall be connected to a 3/4" x 8' copper covered steel ground rod to be installed in the first pull box from the SDG&E service point. Black and red wires shall be fused to the pole. Green wires shall be secured to ground in the pole. The ground wire from the luminaire to the grounding point in the lighting standard shall be green or bare wire.

700-4.2.5 Splicing of Wires. (Add the following subsection):

Splices shall be permitted in pull boxes and lighting standard bases only. All splices shall be waterproof and with epoxy encapsulation or heat-shrinking tubing.

700-4.2.6 Excess Wire in Pull Boxes. (Add the following subsection):

The first pull box from the SDG&E service point shall be considered the City's beginning of service. At this point, the hot leg(s) of the circuit shall be properly fused. The fuse holders shall be connected to all load sides with a minimum of 15 inches of wire from the conduit end providing ample room for movement. All conductors on the service side of the fuse holder and the white neutral/ground on 120-volt circuits shall terminate with a minimum of 15 feet of appropriate size wire beyond the fuse holder to facilitate connection to the service point.

In pull boxes, wiring from one conduit to another shall be of sufficient length to freely wrap along the entire interior of the pull box. This excess wire should be at least 30 inches.

700-4.3 Splicing Units and Terminal Blocks.

700-4.3.2 Fused Splice Connectors. (Delete the last paragraph and replace with the following paragraphs):

Fuses shall be slow-blow 13/32" x 1 1/2" in-line type fuses. The fuses installed in the poles shall be rated at 5 amperes for 120-volt service and 5 amperes for each conductor of 240-volt circuits. Circuit fuses shall be installed in the first pull box from the SDG&E service point and rated at 20 amperes.

Fuses shall be installed in each hot leg of the lighting conductor. Both legs of a 240-volt circuit and only the hot leg of a 120-volt circuit shall be fused. Each light shall be fused inside the pole and accessible from the hand hole.

700-4.3.2.1 Fuse Holders. (Add the following subsection):

Fuse holders shall be completely waterproof, and shall grip the fuse in the load side section when the fuse holder is opened. Holders shall also be able to take a 13/23" x 1 1/2" fuse and shall have crimp-type tubular terminals of the size designed for the size of wire in the particular streetlight. On 240-volt systems, Bussmann HEXAA waterproof double fuse holders (or approved equal) shall be used.

700-4.5 Lamp Ballasts.

700-4.5.1 General. (Add the following paragraphs):

Low Pressure Sodium Vapor ballasts shall be suitable for use on multiple distribution circuits with 60 Hz, 120 or 240-volt rating.

Ballasts shall be of the component type, consisting of precision wound coils and welded magnetic steel lamination assembled together and impregnated with a baked-on insulating weather proof varnish and a metal cased, hermetically sealed capacitor.

The operating sound pressure noise level shall not exceed the ambient noise level by more than 5 decibels (5db) at a distance of 30 feet when measured by a sound level meter conforming to the American Standard for sound level meters. Where the ambient noise level is below 40 decibels (40db), a minimum of 40 decibels (40db) shall be assumed as ambient.

700-4.7 Photoelectric Controls.

700-4.7.2 Photoelectric Control Units. (Delete the first sentence in the second paragraph and replace with the following three sentences and add the following paragraphs):

The control unit shall have a "TURN-ON" level of 2.6 ± 0.6 foot-candles. The TURN OFF/ON ratio shall be 1.5:1. Turn-off shall have a 2.5 second delay.

The control unit shall contain a cadmium sulfide photoelectric cell with a DC drive circuit and DC coil relay. The unit shall be suitable for operation with a 120-volt or 240-volt line supply and a minimum rated load capacity of 1000W tungsten; 1800 VA ballast type loads with a normal power consumption of not more than 2 watts. The control unit shall include 160 joule, 6500 amp MOV surge protection to prevent damage from sudden voltage surges.

Cover shall be made of high impact resistant, UV stabilized polypropylene. Cover shall be colored black.

PART NIGHT controls shall turn of at the middle of the night. Cover shall be colored green.

700-4.9 Low Pressure Sodium Vapor Lamps. (Add the following subsection):

Low Pressure Sodium Vapor lamps shall have clear glass bulbs and be suitable for use in street lighting applications. The lamp shall be designed to operate in a horizontal position.

The Low Pressure Sodium Vapor lamps shall be manufactured by G.E.C., Osram, or Philips. Use of any other lamp will require the Engineer's written approval prior to installation.

All Low Pressure Sodium Vapor lamps shall have a rated average life of 18,000 hours or more. The light output shall be 13,500 Lumens for 90-watt lamps and 33,000 Lumens for 180-watt lamps.

SECTION 701 – CONSTRUCTION

701-8 FOUNDATIONS, FOUNDATION CAPS AND SLABS.

701-8.3 Foundation Caps. (Add the following):

Foundation cap is to be poured onto a clean base surface with continuous concrete from base to cap.

701-10 STANDARDS, PEDESTALS AND MAST ARMS.

701-10.1 General. (Add the following):

Installation shall be according to Regional Standard Drawing E-1 and E-2. Streetlight poles shall be installed 7 feet behind the face of curb or berm, unless otherwise approved by the Engineer. Foundation shall be anchor base. Direct burial will not be allowed.

Streetlight Mounting Heights

1. Pole height measuring from ground surface (± 2 feet):
28 feet for 180-watt units
25 feet for 90-watt units
2. Luminaire mounting height (± 1 foot):
30 feet for the 180-watt units
27 feet for 90-watt units

701-10.2 Mast Arms. (Add the following):

Poles shall be furnished with a mast arm that provides a minimum of six inches of horizontal straight section at the end of the arm to mount a two-inch I.P.S. slip-fitter type luminaire mount.

The mast arm shall be long enough to give a one-foot minimum curb overhang to the luminaire. The usual length for the arm in a typical installation is eight feet. Changes in configuration of mast arms will be permitted, with prior approval of the Engineer, and if the mounting height and stability are maintained.

Mast arms shall be 2 inches I.P.S. aluminum, with an elliptical cross section. Aluminum arms shall be made of corrosion resistant alloys, such as Aluminum Association wrought alloys 6061, 6062, or 6063, or cast alloys 319, or 356. Mast arms shall be self-supporting, without braces, scrolls, or rods. Mounting shall be perpendicular to the street centerline unless otherwise shown on the plans.

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.

701-11 PULL BOXES.

701-11.1 General. (Add the following):

A pull box shall be installed within three feet of each street lighting standard. A pull box shall also be installed within three feet of the service point unless the lighting standard is within six feet of the service point. In this case, only one pull box shall be required between the light standard and the service point. Pull boxes shall **not** be spaced more than 200 linear feet apart. When circuits with multiple lights cross roadways, pull boxes shall be installed at both sides of the road crossings. For single light circuits, pull boxes need not be installed at both sides of the roadway, but only on the side of the roadway opposite the light. Pull boxes shall also be installed where the service run changes direction by more than 30 degrees around corners or curves.

Pull boxes shall **not** be installed in any part of a driveway or other traveled way unless approved by the Engineer. If the pull box is in the traveled way or driveway it shall be provided with a locking metal cover.

(Delete the 5th paragraph and replace with the following):

The bottom of each pull box shall rest firmly on a 6-inch thick bed of 1-inch crushed rock extending 6 inches beyond the outside edges of the pull box. Pull boxes in the vicinity of curbs and/or sidewalks shall be placed adjacent to the back of the curb and/or sidewalk. Pull boxes shall not generally be placed within sidewalk panels.

701-12 CONDUIT.

701-12.1 General. (Add the following):

Conduit laid parallel to the street shall be installed under the sidewalk where new sidewalk is being constructed or directly behind the existing sidewalk.

Conduit shall be laid to a depth of not less than 30 inches and shall be sand-encased with 3-inch minimum over and around all sides. Conduit laid in an open trench shall **not** be covered nor shall any trench or inspection hole be backfilled until the Engineer has accepted installation. No conduit end shall be within 2 inches of making contact with any part of the pull box.

701-14 SERVICES.

701-14.1 General.

701-14.1.1 San Diego Gas & Electric (SDG&E) Connection. (Add the following subsection):

All service points must be obtained from SDG&E. In rare instances, a new light can be connected to an existing light system, but only after approval of the Engineer. An SDG&E easement is not sufficient for a service point unless SDG&E agrees to extend their facilities to the City right-of-way. Service runs across private property are not acceptable.

For service from a wood power pole, the service point will be a pull box that SDG&E will install, at the Contractor's expense, at the foot of the pole or in the City's right-of-way. SDG&E will complete the work when contracted for a service point. The box must be installed before work on the light may begin.

The pull box installed within three feet of the service point (see Section 307-11.1) shall contain waterproof fuse holders and 30-amp fuses on the hot legs. This service point pull box must be in the City's right-of-way.

Before SDG&E will energize a light circuit, three sets of RECORD DRAWINGS must be submitted to the City by the Contractor. The drawings must clearly show:

1. Wattage and type of light
2. Location of each light denoting specific distance in footage from a given intersection (e.g. Community Road south of Kirkham Way 370" SES, or Colony Drive at Colony Way)
3. Conduit runs and pull boxes
4. Service point. If the service point is a wooden power pole or transformer, show the pole or station number.
5. Size of wire in conduit run and poles
6. Lengths and distances of wire runs
7. Sizes and locations of fuses
8. Voltage of the system
9. Manufacturer and model numbers/names of luminaires, poles, and mast arms
10. Installing Contractor's name, address, telephone number, and a responsible contact's name.

701-16 STREET LIGHTING CONSTRUCTION.

701-16.7 Luminaires.

701-16.7.1 Lamp Size and Identification. (Add the following):

Street lighting luminaires shall be completely assembled and furnished with a lamp and an external photoelectric control unit. Luminaires shall be designed for horizontal mounting with a horizontal burning lamp. The optics shall be full cutoff type of standard make and manufactured by a manufacturer of recognized experience and ability who is now regularly engaged in the manufacture of street lighting luminaires. The luminaire shall be die cast aluminum or welded heavy gauge aluminum sheet and furnished with an optical assembly removable without the use of special tools. The luminaire lens shall be glass.

The luminaire shall have a slip-fitted mounting bracket capable of attaching to a two-inch (2") pipe without the need for special mounting parts. Leveling and clamping of the luminaire to the

mast arm pipe shall be accomplished by tightening mounting bolts, which are externally or internally accessible. Luminaries shall be installed in a horizontal position unless other installation is approved by the Engineer.

The luminaire shall include an integral twist-lock type receptacle for photoelectric cell control in accordance with the latest EEI-NEMA standards. The receptacle shall be adjustable with respect to North and pre-wired to the terminal board. The luminaire power unit assembly shall be mounted on a separate component of the luminaire to facilitate replacement and shall consist of an integral ballast, capacitor, and heavy-duty terminal block.

The ballast assembly shall be enclosed in a separate compartment from the optical assembly. Both compartments shall be sealed with a heat-resisting gasket. The optical assembly door hinge shall be designed so that when the door is opened, the hinge pins shall prevent the door from falling free. The luminaire shall be constructed and installed in such a manner to provide the required lighting distribution, with the lower edge of the luminaire's housing below the entire light source and lens. The addition of external shielding to accommodate these criteria is **not** permissible. The light distribution patterns shall be Type II.

The net weight of the complete operating luminaire shall be no greater than 50 pounds for 90-watt units and 55 pounds for 180-watt units.

701-16.7.2 Photoelectric Units. (Add the following):

The photocell shall be properly oriented with the photocell pointing north.

701-16.7.4 Payment. (Add the following):

All street light installations are to be guaranteed for a period of one year from the date of acceptance of the improvements by the City for maintenance, at no additional cost to the City.