1. SPECIFICATIONS

The work to be performed under this contract shall be done in accordance with the Special Provisions contained herein. In these Special Provisions, reference is made to the most current edition of Standard Specifications of the City of Sacramento referred to herein as Standard Specifications and the most current edition of the State Specifications, State of California, both of which shall apply to the work. The General Conditions of the contract shall be governed by Sections 1 through 8 of the Standard Specifications. The Special Provisions shall govern first, followed by the Standard Specifications and State Specifications, State of California. For Specifications of a technical nature not covered by the City Standard Specifications or these Special Provisions, the most current edition of the Standard Specifications and Standard Plans of the State of California, Department of Transportation shall apply. All mention of, and reference to, the State Standard Specifications shall specifically mean the most current edition of the Standard Specifications of the State of California, Department of Transportation. All mention of, and reference to, the State Standard Plans shall specifically mean the most current edition of the Standard Plans of the State of California, Department of Transportation. In the State Standard Specifications and the State Standard Plans, all mention of the "State" shall be construed to mean the City of Sacramento and all mention of the Engineer shall mean the Director of Public Works or his assistant, who may have been assigned to the supervision of this project by the Director of Public Works.

2. SCOPE OF WORK

The work to be performed under these Special Provisions, in general, includes furnishing and installing all necessary equipment and material to construct or modify the street lighting systems as shown on the Plans.

3. SCHEDULING OF WORK

Shall be in accordance with Section 34–4 of the Standard Specifications, except that the contractor shall furnish written notices to the property owners involved informing them of the proposed work at least twenty–four (24) hours prior to commencing work on any sheet.

4. EXISTING UTILITIES

All known underground utilities within the construction area are shown on the Plans. Contractor is required to ascertain the exact location of all utilities prior to doing work that may damage such facilities or interfere with their services.

5. MODIFICATION OF EXISTING IMPROVEMENTS

When existing grades are change, all existing utilities shall be raised or lowered accordingly, including but not limited to, pull boxes, conduits, traffic signal standards, street lighting standards, traffic signal controllers, service pedestals, fire alarm pedestals, and all other utilities located in the effected area.

Contractor shall be responsible for the protection of the existing electrical facilities and shall repair any damages to the facilities that occur during construction. Repair shall be in accordance with the Standard Specifications and any damaged item shall be replaced in–kind at the expense of the contractor.

6. CONDUCTORS

Conductors shall be in accordance with Section 34_12 of the Standard Specifications, except for the following:

1. If the existing ground wire (green 1#10 THW) is used as a pullwire, a new ground wire shall be pulled with the new conductors or cables, unless otherwise specified.

2. Unless otherwise noted, insulation Types THHN and THWN are not approved for installation.

3. The electrolier leads from base to lamp socket shall be No. 12 THW solid wire with 45 mils insulation suitable for 600–volt service for historic decorative, post top and mast arm electroliers.

4. All conductors of AWG #10 or larger shall be identified by printed and embossed labels. #1, #6, #8, #10 conductors shall be printed and embossed.
   a) Both printed and embossed labels shall clearly identify the UL listing, insulation type, voltage rating, AWG number, and the City of Sacramento.
   b) The printed label and the embossed label shall be placed at approximately 90 degrees separation around the center of the conductors.
   c) Labels shall appear every one foot interval. Embossed labels shall be between 0.002" to 0.003" in depth and shall not damage the conductors. Label heights shall be no less than 3/32" for AWG #8 or larger, and shall be no less than 2/32" for AWG #10.

7. CONDUITS

Conduit to be installed underground shall be Schedule 40 polyvinyl chloride (PVC) or Schedule 40 polyethylene conduit as described herein unless otherwise indicated or specified. PVC conduit shall comply with the specifications in Section 34–10 of the City Standard Specifications. High–density polyethylene conduit shall comply with the following specifications:

Conduit shall be fabricated from polyethylene shall be in conformance with applicable ASTM and NEMA standards and Article 347 of the National Electrical Code. Non–black polyethylene conduit shall contain not less than 2500 parts per million (ppm) of a hindered amain ultraviolet light stabilizer. Ultraviolet stabilization additive for black polyethylene conduit shall consist of a carbon black loading of 2.5% 0.5% by weight. Conduit shall be manufactured from high–density polyethylene resin designated as Type III, Category 5, Class C, Grade P34 material in accordance with ASTM D1248. Duct seal shall be installed on all conduits. All new conduits starting/terminating in pull boxes shall have End Bells. Conduit installation shall be in accordance with Section 34–9, 34–10 of the Standard Specifications and as modified by these Special Provisions. "Jet–rodding" is not permitted.

7. CONDUITS (continued)

Conduits terminating in pull boxes, standards, pedestals and cabinets shall rise vertically and shall not slope in any direction. Conduits terminating in standards, pedestals, and cabinets shall terminate one and one–half inches (1½") above finished grade. Conduits shown on the Plans to be adjacent and parallel to each other shall be installed in the same trench or drill hole unless otherwise specified or directed by the Engineer. Under the sidewalk, conduit shall be laid to a depth of not less than eighteen inches (18") below the sidewalk grade.

Conduits shall be installed by trenching or directional drilling method.

All applicable requirements in these Special Provisions to locate, and to protect existing utilities, utility laterals, obstructions, and other facilities in the area shall be conformed to and no additional compensation will be allowed therefor. Contractor is responsible for any damage and the repair of any existing facilities damaged by his/her trenching or drilling operations. Contractor is responsible for any potholing necessary and cost for potholing shall also be included in price paid for applicable items of work and no additional compensation will be allowed therefor. All trenching or drilling work shall be contained within the City right–of–way. If utilities or other obstacles are encountered at the specified conduit depth, any additional drilling required to avoid the obstacle shall be made at the Contractor's expense and no additional compensation will be allowed therefor. Location of trenching and drill holes shall take into consideration minimal impact to the street pavement while still meeting the requirements of these Special Provisions.

Contractor shall replace roadway striping and markings with same material if damaged by directional drilling, bore pits, potholes, or trenching. Replacement striping and markings shall be thermoplastic or paint, per the City of Sacramento Standards.

Contractor shall use the following PVC pipe cement to join conduits and fittings: Premier Cement PVC All Temperature One Step Blue or Christy's Red Hot Blue Glue for Schedule 80 thru 4" diameter.

A. Trenching Method

Installation of conduit by trenching shall be in conformance with the Plans and these Special Provisions. See plan sheets for trench details. Trenches shall be backfilled or covered at the end of each work day. All conduit installed by trenching shall be anchored every 15 feet to the bottom of the trench, with an approved method, so as to prevent the conduit from floating when the concrete is backfilled into the trench.

1. Trenches in new roadways and reconstructed roadways shall be backfilled with slurry portland cement per cubic yard and fine type aggregate as defined in the Standard Specifications Section 10–5. A red oxide in the amount of 5 lbs. per cubic yard shall be mixed uniformly throughout the slurry cement. See plan sheets for amount of sack slurry and depth of conduit(s). Minimum shall be a 3 sack slurry.

2. Trenches in existing roadways shall use the "T–Trench" method. The portion over the trench shall be paved with asphalt concrete, Type A with ¾" aggregate (coarse); except on residential streets where the base course shall be Type A, ¾" aggregate (coarse) and surface coarse shall be Type B, ½" aggregate, (medium), per Section 22 of the City Standard Specifications, unless otherwise directed by the Engineer. See plan sheets for width and thickness of asphalt concrete over trench. Trenches shall be backfilled with slurry portland cement per cubic yard and fine type aggregate as defined in the Standard Specifications Section 10–5. A red oxide in the amount of 5 lbs. per cubic yard shall be mixed uniformly throughout the slurry cement. See plan sheets for amount of sack slurry.

B. Directional Drilling Method

Installation of conduit by directional drilling shall be in conformance with the Plans and these Special Provisions.

Conduits shall be installed such that the top of the conduit(s) are not less than eighteen inches (18") below the finished grade in sidewalk areas and not less than thirty inches (30") in all other areas except as otherwise specified or directed by the Engineer.

Prior to the start of directional drilling, the Contractor shall submit a plan which identifies location and size of proposed drill holes, describes process for identifying/locating existing utility services and other underground utilities or obstructions, identifies a proposed "drilling corridor" to avoid conflicts with existing utilities, services and other facilities. This plan shall be submitted to the Engineer a minimum of ten (10) working days prior to the start of work. The Contractor will not be allowed to directional drill until an approved plan is on file with the Engineer

Directional drilling shall be performed by the technique of creating and directing a bore hole along a predetermined path to a specified targeted location where indicated on the plans to install conduits. The technique shall involve the use of mechanical and hydraulic equipment to change the boring course and shall use instrumentation to monitor the location and orientation of the boring head assembly along the predetermined course. Drilling shall be accomplished with fluid–assisted mechanical cutting. Unless otherwise approved, boring fluids shall be a mixture of bentonite and water or polymers and additives. Bentonite sealants and water will be used to lubricate the drilling head. It is mandatory that minimum pressures and flow rates be used during drilling operations so as not to fracture the subgrade material around and/or above the bore. Uncontrolled jetting (where the primary purpose is to use fluid force to erode soil for creation of the final bore hold diameter) is prohibited. The drilling system shall utilize small–diameter fluid jets to fracture, and mechanical cutters to cut and excavate the soil as the head advances forward.

All drilling shall be located a minimum of three feet (3') from the center of all existing maintenance holes. Drilling that run parallel to any sanitary sewer or storm drainage lines shall maintain a minimum clearance of three feet (3') measured from the centerline of the sewer or drainage line to the adjacent side of the drill hole. Drilling that crosses any sewer or drainage line shall cross at 90 degrees to the line or at a minimum of 45 degrees if a 90 degree crossing is not possible.

8. INSPECTION

Inspection shall be in accordance with Section 34–22 of the Standard Specifications and these Specifications.

9. PULL BOXES

Shall be in accordance with Section 34–11 of the Standard Specifications, except for the following:

All new pull boxes shall be set in place prior to pouring any new sidewalk. Existing pull boxes damaged by the installation of new conduits shall be removed and replaced at the Contractor's expense as directed by the Engineer. All pull boxes shall be placed in sidewalk areas unless otherwise specified on the plans or directed by the Engineer, and shall not be placed in driveways, in vehicular traveled lanes, or in any part of a new sidewalk handicap ramp areas. Contractor shall cut, removed and replace the concrete to the nearest joint when installing new pull boxes. New pull boxes shall have a minimum of 6" of new concrete around all sides in the sidewalks. For pull boxes to be removed, holes or depressions resulting from the removed pull box shall be filled, compacted, brought to grade, and filled to match surrounding materials. A crushed rock foundation shall be installed prior to placing pull box. The crushed rock foundation shall have a minimum of 12" in depth and continue to extend a minimum of 6" beyond the outside edge of the pull box. Crushed rock foundation shall be compacted. Compact crush rock while maintaining integrity of conduit. Then, install pull box on top of crushed rock foundation. Adjust pull box to grade. Conduit and pull boxes shall not be damage nor cracked.

For streetlights system, the pull boxes shall have steel security lids with locking key bolt. For traffic signals installation. All No. 5 and No. 6 Pull Boxes shall have reinforce concrete lids with locking key bolt. Lid shall be 1/4" thick minimum galvanized steel. Lid shall be manufactured with slip resistant surface. Lid shall be non–traffic rated, unless otherwise specified. Lid shall be equipped with a lock mechanism which can be secured from the top of the lid. Lock shall be recessed in a 1 inch diameter circle. Lock shall be Secured Keyed Bryce Fastener, or approved equal. A steel welding plug shall be provided by the manufacturer to be inserted into the 1 inch diameter recessed lock. Lid shall be flush with top of the pull box when lid is completely secured and locked to the pull box. No. 5 pull boxes shall have a single cam locking system, or approved equal. No. 6 pull boxes shall have a double cam locking system, or approved equal. Lid shall have a grounding lug. Lid shall be new and free of scratches, defects, and debris.

10. WIRING

Shall be in accordance with Section 34–13 of the Standard Specifications, except for the following:

After taping, all splices shall be painted with an approved electrical coating which will resist oil, acids, alkalis, and adverse environmental conditions. Pull ropes used to pull conductors in conduit shall be a minimum of three–eights inch (3/8") in diameter.

11. MASTARM STREETLIGHT

A. GENERAL

Mastarm streetlights standards, Type 15, and foundation shall be in accordance with the latest California Department of Transportation Standard Plans, unless otherwise specified in these Special Provisions and Plans.

B. LUMINAIRE

Luminaires to be installed shall be specifically designed for LED use and rated for up to 100,000 hours of operation. Luminaires shall be designed to produce asymmetric distributions conforming to the Illuminating Engineering Society light pattern Type III unless otherwise specified. Luminaire shall utilize a heat sink to efficiently draw heat away from the LED chipset. The units shall be suitable for two–inch (2") slip filter and mounting. All new luminaires to be installed shall be inspected by the Engineer prior to installation. Luminaires shall be supplied without photo cell receptacles unless otherwise called for the Plans. All luminaires supplied with photo cell receptacles that will not be used shall be required to completely bypass the receptacle and a shorting plug shall be securely installed in the receptacle.

C. LED

Luminaire shall be EOI E–LIGHTSTAR ESU–D A01 3M 032 40 M 1050 for intersection lighting or approved equal. The luminaire shall be type III with a minimum CRI of 70 and a CCT of 4000K, unless otherwise specified.

12. METERED SERVICE PEDESTAL

The new metered service pedestal shall be supplied and installed as shown on the Plans and shall conform to the serving utility requirements. Service shall be wired for 120/208 volts or 120/240 volts and single phase as shown on the Plans. The Contractor shall connect the luminaires to the circuits designated on the Plans. Contractor shall also install the service conduit and wires to the SMUD service point in accordance with SMUD's requirements. The Contractor shall protect and lock the service pedestal during construction. After construction is completed, the Contractor shall provide for each pedestal a master lock which will accept a Type 2214 key.

The service pedestal shall be fabricated in accordance with the dimensions shown on the service pedestal detail drawing in the traffic signals / street lighting standard details in the plan sheets. The service pedestal shall consist of a separate metering section and a service section. The meter section shall have a removable cover–top, side, and front sections welded together so that it is rain tight and padlockable.

The service pedestal shall be fabricated from 14 gauge Type 304D stainless steel and as described under the following paragraph in the Caltrans Standard Specifications section 86–3.07A, "Cabinets fabricated from stainless steel shall conform to the following:". The mounting brackets shall be 10 gauge Type 304D stainless steel. All welds shall be of highest quality and ground smooth and finished so that grind marks are not visible.

The enclosure shall be rain tight and dust tight. All welds shall be ground smooth and finished so that grind marks are not visible. A hinged dead front plate with cutouts for the handles of the breakers and the switch shall be provided in addition to a hinged outside door equipped with a draw latch suitable for padlocking. Galvanized anchor bolts shall be inside or outside the service pedestal as shown on the Plans. 5/8" x 18" x 4" Anchor bolts (set of 4) shall also be provided. The enclosure shall have no screws, nuts, or bolts on the exterior, except utility sealing screws. All screws, nuts, bolts, and washers shall be stainless steel. All hinges and hinge pins shall be stainless steel. No surface of the pedestal shall be deflected inward or outward more than 1/16" measured from the intended plane of the surface.

A hinged dead front plate with cutouts for the handles of the breakers and the switch shall be provided. A hinged outside door equipped with a heavy duty draw latch and two (2) heavy duty hasps suitable for padlocking shall be provided for the service section. The dead front panel on the service enclosure shall have a continuous stainless steel piano hinge.

Service enclosures shall be factory wired and conform to NEMA Standards. All control wiring shall be stranded copper, No. 14 AWG THHN/THWN rated for 600 Volts. All control wiring shall be marked with permanent clip sleeve wire markers. Felt, pencil, or stick back markers will not be acceptable. A copy of the wiring diagram for the service pedestal shall be enclosed in plastic and mounted on the inside of the service section.

The terminal lugs or strips shall be copper or alloyed aluminum. All terminals shall be compatible with either aluminum or copper conductors.

The service pedestal shall have provisions for the installation of up to a total of 16 single–pole circuit breakers, including brass links and mounting hardware. All copper wiring used for main bussing shall be No. 2 AWG THHN/THWN and rated for 125 amperes. Branch circuit panel shall use loop wiring rated for 105 amperes with THHN/THWN insulation. All circuit breakers, contactors, and wire shall be listed by UL or ETL. The pedestal shall conform to the NEMA 3–R standard.

Nameplates of a reasonable size identifying the control unit therein shall be installed on the dead front panel. Nameplates shall be black laminated with a white plastic center. All nameplates shall be fastened by screws.

The entire service pedestal shall be constructed with the highest quality workmanship and shall meet all applicable codes. Complete submittal drawings on all substitutions shall be submitted to the Engineer in accordance with Section 34_3 of the Standard Specifications. If the proposed substitute is rejected or if the submittal is not made within the specified time, the specified equipment shall be furnished.

Street light "ON" and "OFF" control will be by photo–electric cell. All conduits and wires shall be furnished and installed by the Contractor. Photocell 120 VAC by Tork (5001M) or approved equal.

Mounted in each metered service pedestal shall be the following equipment:

1. Two (2) 100 Amp, 2 Pole, 120/240V, 10KAIC circuit breakers. Each main breaker shall have internal common trip. Each pole shall have individual on–off control and handle tie for common operation. Breaker shall be Siemens or approved equal.
2. One (1) 15 Amp, 1 Pole, 120/240V, 10KAIC circuit breaker for control circuitry. Breaker shall be Siemens or approved equal.
3. Two (2) 60 Amp, 1 Pole, 120/240V, 10KAIC circuit breakers for traffic signal. Breakers shall be Siemens or approved equal.
4. Six (6) 40 Amp, 1 Pole, 120/240V, 10KAIC circuit breakers for street lighting. Breakers shall be Siemens or approved equal.
6. Two (2) 60 Amp, 3–pole, 120/240V contactors. Normally open, mercury contactors. Contactors shall be Durakool, or approved equal.
7. One oil tight "Hand_Off_Auto" selector switch.
8. One solid copper neutral bus.
9. Incoming terminals (landing lugs).
10. Solid neutral terminal strip.
11 Terminal strips for conductors within the cabinet.

APPROVED BY : Kaleb K. Haile — KALEB HAILE, SENIOR ELECTRICAL ENGINEER — E–15137 P.E. — 06/15/2021 DATE

08/07

REVISIONS			
NO.	DESCRIPTION	DATE	BY

BENCH MARK ELEV. _____
DESCRIPTION

FIELD BOOK N/A
SCALE HORIZ. N/A VERT. N/A

CITY OF SACRAMENTO
DEPARTMENT OF PUBLIC WORKS

DRAWN BY: STAFF DATE
DESIGNED BY: STAFF R.E.E. DATE 06/14/21
CHECKED BY: K. HAILE R.E.E. E–15137 DATE 06/15/21

PLANS FOR

STREETLIGHT SPECIAL PROVISIONS No. 1

DWG. NO.
SHEET OF
PN:

CAD FILE: P:\Engineering Services\Tech Elec\Drawings\Standard Details for Traffic Signals and Streetlights\2021 Electrical Standards\WORKING\Special Provisions No.1 2021.dwg Monday, June 14, 2021 2:29:09 PM