ANAHEIM CANYON METROLINK STATION IMPROVEMENTS PROJECT

IFB 0-2193

Volume 2

CONTRACT TECHNICAL SPECIFICATIONS

APPENDIX A

CITY OF ANAHEIM SPECIAL PROVISIONS

FOR

TRAFFIC SIGNAL, STRIPING AND SIGNING IMPROVEMENTS

(RCP2018-14332)

CITY OF ANAHEIM

ANAHEIM CANYON METROLINK STATION TRAFFIC SIGNAL IMPROVEMENTS

AT

LA PALMA AVENUE AT METROLINK RAIL CROSSING (±275' W/O PACIFICENTER DRIVE/LINK)

AND AT

LA PALMA AVENUE AT PACIFICENTER DRIVE/LINK

SPECIAL PROVISIONS

FOR

TRAFFIC SIGNAL, STRIPING AND SIGNING IMPROVEMENTS

RIGHT OF WAY CONSTRUCTION PERMIT NO(S). RCP2018-14322

Prepared by

Department of Public Works
Traffic Engineering Section
200 South Anaheim Blvd., Anaheim, CA 92805
714-765-5183

JULY 2020

ANAHEIM CANYON METROLINK STATION TRAFFIC SIGNAL IMPROVEMENTS AT LA PALMA AVENUE AT METROLINK RAIL CROSSING (±275' W/O PACIFICENTER DRIVE/LINK) AND LA PALMA AVENUE AT PACIFICENTER DRIVE/LINK
RIGHT OF WAY CONSTRUCTION PERMIT NO(S).RCP2018-14322

SPECIAL PROVISIONS – TRAFFIC IMPROVEMENTS

PART 1 – GENERAL PROVISIONS

SECTION 2 Scope and Control of Work

This project includes construction of a new traffic signal; modification of existing signal communication facilities; signing; striping; pedestrian access ramps and all appurtenant work as shown on the plans and delineated in these specifications.

2-5.2 Precedence of Control Documents

Should it appear that the work to be done or any matter relative thereto is not sufficiently detailed or explained in the PLANS, Specifications and these Special Provisions, the CONTRACTOR shall apply to the FIELD ENGINEER for such further explanation as may be necessary and shall conform to such explanation or interpretation as part of the Contract.

In the event of any discrepancy between any scaled dimensions on the PLANS and the figures written thereon, the figures shall be taken as correct.

The Specifications, PLANS, Special Provisions and all supplemental contract documents are essential parts of the Contract and a requirement occurring in one is as binding as though occurring in all. If there should be any inconsistencies in the above documents the order of authority and control shall be as follows:

1) PLANS
2) Special Provisions
3) Standard Specifications
4) Standard Details
5) Reference Specifications

Inconsistencies in Standard Specifications, the order of authority and control shall be as follows:

1) Sections referenced in the Special Provisions
2) Standard Specification Supplement, as adopted by the City of Anaheim herein these documents

3) State of California Department of Transportation (Caltrans) Standard Specifications, 2018 Revised Edition and subsequent errata.

4) "GREENBOOK," Standard Specifications for Public Works Construction, 2018 Revised edition

2-5.3 Submittals

In addition, CONTRACTOR agrees that the follow listed traffic signal submittals shall be delivered to the FIELD ENGINEER for review and approval by the CITY OF ANAHEIM prior to ordering of materials.

Submittal Items

1. Traffic Signal Controller Unit (Section 15)
2. Vehicle LED Indications (Section 17)

For traffic signal equipment not listed above, a certificate of compliance with Caltrans Standard Specifications is sufficient.

Unless otherwise set forth in elsewhere these Special Provisions, three (3) copies will be submitted for review. Electronic submission will be accepted by permission of the ENGINEER.
Electronic delivery of Submittals

The CONTRACTOR may deliver submittal documents to the CITY in electronic format (5MB or less) via email to facilitate review and response, unless otherwise restricted in these Special Provisions. Submittals shall be directed to the CONTRACT ADMINISTRATOR, CONSTRUCTION SERVICES MANAGER or FIELD ENGINEER. Submission by email shall supersede any requirement for multiple copies of each submittal document. However multiple emails may be required to accommodate the aforementioned file size limitation. All submittal documents must be complete, good quality and clearly legible. Proposed equipment models shall be clearly identified. Highlighted with contrasting colors or outlined with heavy borders.

2-6 Work to Be Done

All traffic signal system improvement work shall be considered specialty in nature. **Any CONTRACTOR and his/her SUBCONTRACTORs proposing to perform this specialty work must possess a valid Class C-10 license**. Persons designated to perform such work as electricians for CONTRACTORS licensed as Class C-10 shall be certified in accordance with California Labor Code Section 3099. Proof of Certification shall be provided to the CITY prior to commencement of work.

CONTRACTOR shall schedule and attend a pre-construction meeting with required CITY Representatives prior to start of construction activities. The CONTRACTOR shall submit to the Field Engineer at the project pre-construction meeting a detailed schedule for the items of work to be done. The schedule shall be updated at least once a month and submitted to the FIELD ENGINEER.

The CONTRACTOR shall meet with CITY staff and FIELD ENGINEER as required for the duration of the project.

2-9 Surveying

This section shall be supplemented as follows:

Prior to Construction, all survey points that may be disturbed shall be tied out and a Corner Record of each point shall be filed with the County Surveyor. A copy of the Recorded Corner Record shall be submitted to the City's Construction Services Division following the completion of the construction. A Corner Record of each point that was disturbed shall be filed with the County Surveyor. A copy of the Recorded Corner Record shall be submitted to the City's Construction Services Division prior to the recording of a Certificate of Completion or release of bonds.

2-9.1 Permanent Survey Markers

This section shall be supplemented as follows:

Prior to the start of construction, the contractor shall contact **Rick Hill, City of Anaheim, Survey Party Chief at (714) 765-5284** to coordinate the transfer of existing benchmark and ties. City of Anaheim survey crews will transfer the benchmarks and ties.

SECTION 6 Prosecution Progress and Acceptance of the Work

6-2.1 Working Hours

The working hours for this project shall be as follows: 7:00AM - 7:00PM. Lane closures, beyond the lanes shown on the project traffic control plans, will only be allowed between 8:30AM and 3:30PM, as approved by the City Public Works Inspector. There may also be aspects of the project that require nighttime work. This will only be allowed with the approval of the FIELD ENGINEER.

~~**For work areas within the Anaheim Resort, Anaheim Stadium and Arena Area**: The CONTRACTOR is required to schedule the work around the area event calendar and blackout dates for which no travel lane impacts are permitted. Working hours and dates must be submitted to the City's Traffic Management Center either by e-mail (tmc1@anaheim.net) or fax (714) 765-4493. CONTRACTOR MUST RECEIVE BACK AND ATTACH CONFIRMATION CLEARANCE TO PERMIT WHICH IS TO BE ON SITE AT ALL TIMES. CONTRACTOR SHALL NOTIFY PUBLIC WORKS FIELD INSPECTOR/ENGINEER A MINIMUM OF 48 HOURS PRIOR TO START OF ANY WORK. Failure to comply with these requirements may be cause for a stop work notification and suspension of permit. For additional questions regarding the area event calendar, call (714) 765-5202.~~

SECTION 7 Responsibilities of the Contractor

7-5 Permits

The Contractor shall obtain all permits and licenses as required by the City. The Contractor shall pay all costs incurred at no cost to the City of Anaheim.

7-8.1 Cleanup, Marking Removal and Dust Control

The third paragraph is amended as follows:

Materials and equipment shall be removed from the site as soon as they are no longer necessary. Before the final inspection, the site shall be cleared of equipment, unused materials, rubbish, and all markings placed by the Contractor, the City, Underground Service Alert (USA), or other agent(s)' markings necessary for the performance of various items of work. These markings shall include, but not limited to paint, stakes, and metal tags.

The last paragraph is amended as follows:

Failure of the Contractor to comply with the Engineer's cleanup orders, including removal of markings shall result in an order by the City to suspend work until the condition is corrected. Should any cleanup items become disputed items of work resulting for the City to perform the work, the City shall hold the CONTRACTOR accountable for such costs incurred.

7-10 Public Convenience and Safety

The CONTRACTOR shall conduct his operations so as to minimize obstructions and inconvenience to the public. Equipment shall be operated on the site only during the hours of 7:00 AM to 3:30 PM, unless otherwise authorized by the CITY. All other provisions shall apply as set forth in Section 7-10, "Public Convenience and Safety," of the Standard Specification Supplement.

7-10.1 Traffic and Access

Add the Following:

Construction signs, barricades, delineators, warning lights, stripes, markings, legends, and all other devices used to implement the plan including traffic control methods shall conform to the requirements of the latest edition of the Manual of Uniform Traffic Control Devises (MUTCD), and Work Area Control Handbook (WATCH latest edition). Portable Changeable Message Signs (CMS) shall conform to the requirements of Caltrans Standard Specifications latest Edition and as **amended in Sub-Section 7-10.1 (a), herein these Special Provisions, of these Specifications.**

Traffic control guidelines are included in the Specifications. The Contractor must adhere to the number of lanes reflected in the traffic control guidelines unless otherwise approved in writing by the Engineer. Detour and Traffic Control plans prepared and signed by a licensed engineer shall be submitted to the Construction Services Manager and Traffic Engineering Division for approval, prior to any construction activities. Traffic control plans should include flagmen usage at minor

streets and/or T-intersections. Detouring shall be accomplished by the use of paint or reflectorized tape.

~~The Contractor shall furnish and maintain during the duration of the project~~ Portable Changeable Message Signs (CMS) ~~suitable for both daylight and night time operations under varying climatic conditions; i.e., visibility for speed control, advisories on alternate routes, and general traffic management during all working shifts, **as directed by the Engineer** (also refer to Section 7, Sub-section 7-10.1 (a) 2, of these Special Provisions). Four (4) CMS will be required for this project to be installed at the project approaches or locations designated by the Engineer.~~

7-10.1 (a) Portable Changeable Message Signs (CMS)

1. Each portable changeable message sign unit shall consist of a controller unit, a power supply and a structural support system, all mounted on a trailer. The unit shall be assembled to form a complete self-contained portable changeable message sign which can be delivered to the site of the work and placed in immediate operation. The complete message sign unit shall be capable of operating in an ambient air temperature range of -30° F to +165° F and shall not be affected by unauthorized mobile radio transmissions. The trailer shall be equipped so that it can be leveled and plumbed.

2. The message displayed on the sign shall be visible from a distance of 1,500 feet and shall be legible from a distance of over 1,250 feet, at noon on a cloudless day, by persons with vision of or corrected to 20/20 and capable of displaying messages in two font sizes. The sign panel shall be **3-line matrix, each of which shall contain eight (8) display panels**. Sign shall utilize lens enhanced all LED (light-emitting diode) display providing for both daylight and nighttime legibility.

   CMS "display" shall be re-programmed at any time during the course of construction, as deemed necessary and as directed by the Engineer. Re-programmed messages shall include but not be limited to visibility for speed control, advisories on alternate routes, and advisories on general/critical construction activities including schedule. Re-programming these messages offers continuous notices for the benefit of the public. Messages/advisories shall all be approved by the Engineer.

3. The sign face shall be flat black and shall be protected from glare of the sun by a method which does not interfere with the clarity of the sign message. The sign shall be raised and lowered by means of a power driven lifting mechanism provided with a mast safety pin to prevent the sign case from falling in the event of a power/hydraulic system failure. The mechanism shall include an auxiliary manual pump with release for emergency use.

4. The matrix sign shall be capable of complete alpha numeric selection.

5. The controller or CPU (Central Processing Unit) shall be an all solid-state unit containing all the necessary circuitry for the storage of at least 5 preprogrammed messages. A keyboard entry system shall be provided to allow an operator to generate an infinite number of additional messages over the preprogrammed stored messages. Message memory shall be retained during power interruptions or failures, and the unit shall be capable of operating the sign system in the event that the controller is disconnected. The

controller shall provide for a variable message display rate which allows the operator to match the information display to the speed of the approaching traffic. The flashing off time shall be operator adjustable within the control cabinet. The system shall be equipped with a security lockout feature to prevent unauthorized use of the controller. The controller shall be installed in a location allowing the operator to perform all functions from one position.

6. Full operation height shall be with the bottom of the sign at least 7 feet above the ground and the top no more than 14.5 feet above the ground, or as designated by the Engineer.

7. After initial placement, portable changeable message signs shall be moved from location to location as directed by the Engineer.

Note: The Contractor shall contact the following and obtain traffic control plan approval prior to any construction work:

Jose Cortez
Resident Engineer
Construction Services Division
Dept. of Public Works
City of Anaheim
(714) 765-5176

Ralph Contreras
Principal Traffic Engineer
Traffic Engineering Division
Dept. of Public Works
City of Anaheim
(714) 765-5183 Ext. 4526

~~*The Contractor must provide a detailed traffic control plan, signed and stamped by a licensed engineer, detour route and signage for all work to Traffic. The Contractor must obtain Traffic review and approval prior to the start of any construction.*~~

The Contractor shall furnish and place all warning and directional signs and other traffic control devices required to direct, control and protect the traveling public while construction operations are in process.

Normal working hours for the project are Monday through Friday from 7:00AM to 7:00PM. The working hours for all work within work zones (those work areas that do not in any way restrict traffic any more than the traffic control guidelines) will be from 8:30AM to 3:30PM. The minimum number of lanes required by the City per the traffic control guidelines must be maintained in order for the contractor to qualify for the longer work hours. No staging of trucks outside the "Work Zones" will be permitted before 7:00AM or after 4:00PM.

It is the Contractor's responsibility to maintain safe, and adequate pedestrian and vehicular access to intersecting streets; continuous and unobstructed access along both ***La Palma and Tustin Avenues*** unless otherwise approved by the City Traffic Engineer. The Contractor shall conduct his/her operations so as to offer the least possible obstruction and inconvenience to the public, and shall have under construction, no greater length or amount of work than can be prosecuted properly with due regard to the rights of the public. The access rights and safety of the public will be considered at all times.

The Contractor will be responsible for all temporary traffic control until permanent striping is installed.

The CONTRACTOR shall post "Temporary No Parking Tow Away" signs defining the time and date of any restriction, 72 hours prior to work.

The CONTRACTOR shall notify the Traffic Management Center at (714) 765-5202 at least 48 hours prior to work zone/detour changes that will impact traffic signals.

The CONTRACTOR shall notify the Construction Services Manager a minimum of 5 working days prior to closing or restricting left-turn movements.

The CONTRACTOR shall be responsible for placing temporary A.C. paving to facilitate the traffic control for the project. ~~Placement of and subsequent removal of all temporary A.C. paving on the project shall be included in the price paid for construction of traffic signal and safety lighting facilities and no additional compensation will be allowed.~~

The Contractor shall provide and install 48" x 48" plywood backed "business is open" signs where entrances are located for the businesses affected by construction longer than 3 days. The signs shall be placed at the various driveways, cross streets and alleys and as directed by the Field Engineer. Business signs shall be installed and/or relocated at the completion of each phase of construction. Sign content, lettering and finish are to be approved by the Construction Services Manager prior to installation. The signs shall be placed on barricades.

7-10.3 Street Closures, Detours, Barricades

Add the following:

The Contractor shall keep access at street crossing and driveways open at all times.

If any street(s) within the project is/are to be closed (***approved by the City***), the Contractor shall contact all residents and businesses in the area a minimum of 48 hours prior to the closure and shall provide the Construction Services Manager with written verification that all residents and businesses were contacted.

~~Payment for conformance to the requirements of this Section, including *preparation of and obtaining approval of, traffic control plans; furnishing and installing construction area traffic control devices; i.e.,* ***portable changeable message signs (CMS)****, etc.,* as ordered by the Engineer, for the sole convenience and direction of public traffic as specified in Section 7-10, "Public Convenience and Safety", and these Special Provisions, shall be deemed to be included in the price paid for construction of the traffic signal and safety lighting facilities no additional compensation will be allowed.~~

PART 2 – CONSTRUCTION MATERIALS

Section 214 Traffic Striping, Curb, Pavement Markings, and Pavement Markers

214-1 General

Insert the following at the end of this section:

All traffic striping materials shall conform to the California Department of Transportation (Caltrans) Standard Specifications, 2018 Revised Edition and these Special Provisions.

214-5 Thermoplastic Material for Traffic Striping and Markings

214-5.1 General

Insert the following at the end of this section:

Thermoplastic material shall not exude fumes which are toxic, obnoxious or injurious to persons or property when it is heated during application.

214-6 Pavement Marker

214-6.1 Type of Markers

Insert the following at the end of this section:

Two-way blue pavement markers shall be installed for all fire hydrants per City Standard Detail 457.

214-6.3 Non-Reflective Pavement Markers

214-6.3.1 General

Insert the following after the first paragraph:

Non-reflective ceramic pavement markers shall be either "white" or "yellow", specified accordingly as per layout and installation detail plans.

214-6.4 Retroreflective Pavement Markers

Insert the following at the end of this section:

Reflective raised pavement markers shall be either "one-way clear", "one-way yellow", "two-way clear", "two-way yellow", "red/clear", or "two-way blue", specified accordingly as per layout and installation details.

214-7 Adhesives for Pavement Markers

214-7.2 Epoxy Adhesives.

214-7.2.1 General

Insert the following at the end of this section:

All epoxy adhesive for pavement markers shall conform to the California Department of Transportation (Caltrans) Standard Specifications, 2018 Revised Edition.

Section 215 Traffic Signing

All work shall conform to detail drawings as shown on the PLANS and as specified in Section 82 of the State of California Department of Transportation (Caltrans) Standard Specifications, 2018 Revised Edition, and these Special Provisions.

All signs shall be standard size and color as specified in the California MUTCD, latest edition, unless otherwise specified by the ENGINEER.

All new signs to be installed shall be the international symbol (if available) unless otherwise specified.

All signs shall be aluminum panel not less than $^{5}/_{64}$" thick, 6061-T6 or 5052-H38 Alloys, exceptions are Type L, K and street name signs which shall be $^{1}/_{16}$" thick, radius corners $^{3}/_{8}$". Aluminum base metal shall be cleaned, deoxidized and coated with a light tightly adherent chromated conversion coating free of any powdery residue.

All sign facings shall be manufactured of high intensity grade, encapsulated lens sheeting, (Hi-Intensity or equal) except for R26 signs which shall be Engineering Grade material (enclosed lens). All signs which could result in a moving violation shall be high intensity. All signs provided under this CONTRACT shall include an anti-graffiti film overlay. Protective overlay shall be 3M Series 1160A overlay or approved equivalent. The anti-graffiti overlay shall be considered as included in the price bid for the item of work and no additional payment will be made therefore.

The date of installation of a sign is to be embossed on the back of the sign and shall be considered as the start of the warranty period. "Property of City of Anaheim" should also be embossed on back of sign.

Sign locations and height shall be according to City of Anaheim Standard 426-C or as directed by the ENGINEER. All signs are to be 7' above the ground measured to the bottom of the lowest sign. Exceptions may be made for bus stop signs, small R26 signs, or bike arrows down to 6' when mounted below another sign not installed within the sidewalk. All median mounted signs shall be 4' above the ground measured to the bottom of the sign except for:

a. Type K markers to be 1' above the ground to the bottom of the sign or 17-18" above the ground when mounted on Eze-Erect break away posts.
b. All type "N" markers for barricades shall be 2' above the ground to the bottom of the sign.

All stop signs (R1-1) and street name signs shall be mounted on 2½"x12' round galvanized posts. Large signs or sign combinations shall use 2"x15' round galvanized posts. Signs will be mounted with bolt extended through the post. Anchors will be placed at the base of the post to restrict rotation.

No signs will be allowed on traffic signal poles except the following:

Poles - R26, R4-7, R6-2, R3-3, R3-7, R3-4, R10-7, R10-11, W12-1 and Type "N-1" marker.

Mast arms - R61Series, R54, R73 Series and R3-4.

All signs placed within the public right-of-way shall be installed using the following guidelines:

a. Signs will be installed on marblelite or steel street light poles wherever possible. No signs shall be placed on wood poles at anytime.

b. Larger (wide) signs will always be mounted on the top of a sign combination.

   No sign shall have an outside edge closer than 2' to the back of curb while maintain a 3' clear sidewalk. For sidewalk less than 7' wide and adjacent to curb, sign post may be mounted behind the sidewalk, except for stop signs. Refer to Anaheim Standard Plan 426-C.

c. Sign panel facings shall be perpendicular to approaching traffic unless otherwise specified by the ENGINEER.

d. Signs shall be mounted on posts in a good workmanship manner using metal hardware suitable for the type of installation made.

e. Installation materials shall be of stainless, galvanized or other material that does not rust, and is theft proof where available.

f. The minimum distance between signs shall be 50'. Exceptions must be approved by ENGINEER. Signs shall be kept a minimum distance of 6' in front of trees, power poles, etc. and a minimum distance of 50' beyond them. Signs will be kept far enough away from trees so growth will not obstruct visibility of the sign.

g. R26 and other signs are typically not mounted closer than 150' apart.

h. No sign shall be placed on the same post with a stop sign (R1-1) except the 2-way or 4-way supplemental plates. The supplemental plates will not overlap on the stop sign and will be attached with separate bolts.

No signs will overlap and must be installed with separate bolts. "Begin/End" or "Tow-Away" plates are an exception.

Post materials shall consist of the following: 6', 8' or 11' U-channel posts, 6' guide posts, Eze-Erect sign post (break-away), 2"-4" Carriage bolts, 4-5/16"x1/2" through 1" hex bolts, 5/16" nuts, 5/16"x3/4" and 1" anti-theft bolts and anti-theft nuts, P.C. 2.5 aluminum sign caps, P.C. 1 aluminum sign saddles, 5/8"x20-1/2" carriage bolts, 5/8" nuts, 2" and 2½" clamp on U-bracket, Gerrard bracket, 3/4" 201 stainless steel buckles, 3/4", 030, 201 Stainless steel banding, side arm bracket - heavy duty channel iron, galvanized sign braces, galvanized 3/16"x1"x30". 5/16"x1" fiber or nylon washers behind a 5/16"x1" or 1¼" metal washer shall be used on the face of all high-intensity or equal signs.

All posts installed on median in asphalt or concrete shall have breakaway braces.

For installation of signs that are 36" or larger and/or sign combinations a brace is used for strength (3/16"x1"x30" or 36" brace).

Median noses shall be treated as follows:

a. All median noses shall be painted with yellow reflective traffic paint from BCR to ECR, and R4-7 sign and type N-1 Marker,
b. All median signs shall be mounted 5' behind the median nose. All core drill holes must be large enough for post anchors to fit. All core drill holes must be patched around the sign post with concrete after installation.

PART 3 – CONSTRUCTION METHODS

Section 314 Traffic Striping, Curb and Pavement Markings and Pavement Markers

314-1 General

Insert the following at the end of the first sentence:

All traffic striping and pavement markings shall conform to the California Department of Transportation (Caltrans) Standard Specifications, 2018 Revised Edition.

Use of permanent tape for a traffic stripe or a pavement marking shall not be permitted.

The CONTRACTOR shall take all reasonable precautions to protect the paint during drying time and shall be required to wet sandblast out all objectionable tracking.

314-2 Removal of Traffic Striping and Curb and Pavement Markings

314-2.1 General

Replace the first sentence with the following:

Paint removals shall be performed by wet sandblasting technique, meeting the latest requirements and restrictions by the State Pollution Control Agency. The CONTRACTOR shall be responsible for the immediate removal of sandblasting materials by vacuum or mechanical street sweeping devices.

314-4 Application of Traffic Striping and Curb and Pavement Markers

314-4.1 General

Insert the following at the end of this section:

CONTRACTOR shall provide all stencils and street marking legend cutouts, all of which shall conform to standards presently in use in the City of Anaheim for the restriping of all existing pavement legends. For all new work, where new legends are required, the CONTRACTOR shall use State of California Department of Transportation (Caltrans) Standard Plans and Specifications, 2018 Revised Edition

314-4.2 Control of Alignment and Layout

314-4.2.1 General

Insert the following at the end of the second sentence:

The pre-lining or layout shall be done by the CONTRACTOR where required by the ENGINEER. Existing lines shall be followed in such a manner as to present a uniform, pleasing appearance, and misalignment or disregard to previous painting will not be permitted. Abrupt breaks in alignment between broken segments will not be permitted. The ENGINEER shall be the sole judge on the accuracy and acceptability of the alignment of the work. All lines shall be clean and sharp as to dimensions. Ragged ends of segments, fogginess along the sides or objectionable dribbling along the unpainted portions of the stripe shall be wet sandblasted out to the satisfaction of the ENGINEER.

The finished product shall have an opaque, well-painted appearance with no black or other discolorations showing through.

If the existing markings are not visible, the CONTRACTOR will be required to pre-mark each installation prior to the application of the material. Where no existing markings are in place, the CONTRACTOR shall place the new pavement markings where directed by the ENGINEER.

314-4.3 Painted Traffic Striping and Curb and Pavement Markers

314-4.3.1 General

Insert the following at the end of this section:

All traffic lines shall conform to the State of California Department of Transportation (Caltrans) Standard Plans and Standard Specifications, 2018 Revised Edition and these Special Provisions.

The following Details of the Standard Plans shall be routinely used for traffic lines:

Line	Anaheim Detail	Caltrans Detail	Pavement Marker Information
Yellow Skip or Solid	450 & 460	2 and/or 4	Type AY & D
Double Yellow CL	453 & 458	22 and/or 23	Type AY & D
White Skip	451 & 459	10 with 4 Type "A" markers	Type A & G & C
Two-Way Left-Turn Lane	454	32 and/or 33	Type AY & D
Channelizing Stripe	455	38 and/or 38C	Type A & G & C
Trap Lane Stripe		37B	Type A & G & C
Median Islands	456		Type D

Detail 9 (painted skip strip) will be allowed in certain instances when it is not advisable to emplace a long-life line due to line locations, pavement conditions, or special circumstances. This determination will be made by the ENGINEER.

All crosswalks, turn arrows, stop and yield bars and messages and all other pavement legends, with the exception of "Bike Lane" and continental crosswalks (per Standard Detail 477), shall be installed in thermoplastic on arterial streets. They shall be painted on minor streets and intersections unless specified thermoplastic on PLANS or work orders. Continental crosswalks shall be applies in 2 coats of paint with second coat applied 3 days after application of the first coat.

Long-life pavement marking legends must be thermoplastic.

Bike lane stripes and messages shall be painted. The stripe may be 6” wide solid white with 100' of skip at intersections or major driveways.

The first three (3) raised pavement markers for any white line at an intersection shall be Type C for the opposite direction of travel. See Anaheim Standard Detail No. 459.

CONTRACTOR shall install traffic striping, marking, arrows and messages pursuant to the PLANS where provided. All work and materials shall conform to the requirements of the State of California, Standard Specifications, 2018 Revised Edition, and the latest edition of the State of California MUTCD. Payment shall be per this specification.

CONTRACTOR shall furnish and install traffic delineation using paint "Cat tracking", temporary marking tape, or other approved media on the same working day as existing stripes are lost, including bicycle lanes, in locations consistent with the striping PLANS. If temporary marking tape is used, all tape shall be removed prior to installation of permanent striping.

CONTRACTOR shall apply paint prior to installing raised pavement markers. Raised pavement markers shall be placed on the newly painted line. When raised pavement markers are not used, two (2) coats of paint shall be used.

CONTRACTOR shall furnish and install raised pavement markers no sooner than seven (7) calendar days and no later than fifteen (15) calendar days after traffic striping is installed pursuant to the striping PLANS. When two (2) coats of paint are specified on the PLANS, the second coat shall be applied no sooner than seven (7) calendar days and no later than fifteen (15) calendar days after new pavement surface is placed.

CONTRACTOR shall remove all existing raised pavement markers before any pavement overlay or slurry seal is placed on the street.

314-4.3.6 Measurement

Insert the following to the end of this section:

Lineal feet of painted lines shall be measured for payment by standardized odometer. Other units for which payment is to be made shall be in accordance with the units designated in the itemized bid proposal.

~~314-4.3.7 Payment~~

~~Insert the following at the start of this section:~~

~~Full compensation for conforming to the requirements of this section shall be considered as included in the price bid for the item of work and no additional payment will therefore be made. Payment for other signing and striping not specifically mentioned in the price bid shall be paid on a time and materials basis.~~

PART 4 – EXISTING IMPROVEMENTS

Section 400 Protection and Restoration

400-1 General

Add the following:

The Contractor shall take due precautionary measures to protect all public and private properties and improvements, including but not limited to drainage facilities, private walls and footings (including adjacent properties) parkway improvements, driveways, water structures, vegetation, and all other improvements and structures shown on the construction drawings and encountered during construction. These improvements shall be safely guarded from damage or loss in connection with this contract by the Contractor at all times. Should any facility, structure, pavement, or property be damaged during operations of the Contractor, he/she shall immediately notify City of Anaheim Construction Services Manager at (714) 765-5176 Ext. 5286. All damaged existing improvements shall immediately be replaced, repaired/or reconstructed to the satisfaction and approval of the City of Anaheim. The Contractor shall pay all damages and losses incurred.

Contractor shall provide for maintaining existing and temporary electrical systems per Caltrans Standard Specification 86-1.06. ~~Payment for this work shall be included in the price paid for construction of traffic signal and safety lighting facilities and no additional compensation will be allowed.~~

Contractor shall maintain and water existing landscape designated to be protected-in-place, including hand watering if necessary. Should the Work interrupt the irrigation system of adjacent landscape and/or landscape designated to remain within the limits of work, contractor shall provide temporary water to maintain the health of the plant material, as required. ~~Payment for this Work shall be included in the price paid for construction of traffic signal and safety lighting facilities and no additional compensation will be allowed.~~ Any landscape areas damage by the CONTRACTOR's construction operations shall be replaced or restored in as near the original condition as reasonable.

PART 7 STREET LIGHTING AND TRAFFIC SIGNALS

Attention is directed to the "City of Anaheim Traffic Engineering Specifications for Traffic Signal and Safety Lighting Facilities", ~~Intelligent Transportation System (ITS) Special Provisions and Streetscape Special Provisions~~ following herein these Specifications.

CITY OF ANAHEIM

ANAHEIM CANYON METROLINK STATION TRAFFIC SIGNAL IMPROVEMENTS

AT

LA PALMA AVENUE AT METROLINK RAIL CROSSING (±275' W/O PACIFICENTER DRIVE/LINK)

AND AT

LA PALMA AVENUE AT PACIFICENTER DRIVE/LINK

SPECIAL PROVISIONS

FOR

TRAFFIC SIGNAL INSTALLATION

RIGHT OF WAY CONSTRUCTION PERMIT NO(S). RCP2018-14322

Prepared by

Department of Public Works
Traffic Engineering Section
200 South Anaheim Blvd., Anaheim, CA 92805
714-765-5183

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C I T Y O F A N A H E I M
TRAFFIC ENGINEERING SPECIFICATIONS
FOR
TRAFFIC SIGNAL AND SAFETY LIGHTING FACILITIES

Note: The following shall replace Part 7, Street Lighting and Traffic Signal Systems," of the GREENBOOK, Standard Specifications for Public Works Construction, 2018 Edition.

1 General

The CONTRACTOR shall furnish all tools, equipment, materials, supplies and manufactured articles and shall perform all operations necessary to construct traffic signal and street lighting facilities as shown on the drawings and as specified herein.

Reference Specifications and Standard Plans

1. Standard Specifications - Except as modified herein, materials and installation shall conform to the 2018 Revised Caltrans Standard Specifications (CSS). All references in this section to "Standard Specifications" shall be understood to be referenced to the Caltrans Standards Specifications.

2. Standard Plans - Except as modified herein, all references in this section to "Standard Plans" shall be understood to be referenced to the 2018 Revised Caltrans Standards Plans (CSP) and subsequent errata.

3. Codes, Ordinances, and Regulations - All electrical materials and equipment furnished and installed under this section shall conform to the referenced regulations and codes specified in Section 86-1.01D, "Quality Assurance," Subsection 86-1.01D(1), "General," of the Standard Specifications, and to all other ordinances, Specifications, Standards and Regulations of the authorities having jurisdiction.

2 Description

Furnishing and installing traffic signal, signal system communication, safety lighting and sign illumination systems and payment shall conform to the provisions in Division X, "Electrical Work," of the Standard Specifications and these Special Provisions.

Prior to the commencement of any work within public right-of-way, the CONTRACTOR shall obtain a Public R/W Excavation and Construction Permit, at no cost, from the City of Anaheim, Public Works Engineering Department.

Traffic signal, signal communication, signing and striping work is to be performed at the following intersections:

1. La Palma Avenue at Metrolink Rail Crossing (±275' West of LINK)
2. La Palma Avenue at LINK

3 Underground Utilities

CONTRACTOR shall call Underground Service Alert at (800) 422-4133, 48-hours before digging for location of underground utilities.

Attention is directed to all conditions of Part 4, Section 402, "Utilities," of the "GREENBOOK" Standard Specifications for Public Works Construction, latest edition.

Attention is directed to the existence of certain hazardous underground utility lines within the construction area which include (but not limited to) natural gas and electrical. It shall be the CONTRACTOR'S responsibility to "pot hole" or expose any utility facilities that need protection under direction of the utility owner(s) or Engineer. Backfill and capping methods for pothole excavation shall conform to City Standard Detail No. 132.

One or more hazardous underground utility lines may necessitate the work or rearrangement to a lower elevation, by the owner(s), during construction operation. If such rearrangement work occurs, the CONTRACTOR shall allow each affected utility company ten (10) working days to rearrange its facility at any given locations.

No contractual work will be permitted over or, within 10' horizontally of, any hazardous underground utility line to be rearranged, until such rearrangement work is completed.

Where hazardous overhead utility lines exist and rearrangement is not required, the CONTRACTOR shall arrange to meet a Utilities Representative at the job site prior to work to discuss work plan. Contractor may be directed by Utilities Representative to hire a high voltage pre-qualified third party to perform work in the vicinity of utility lines. Additionally, the CONTRACTOR may opt, under his/her own accord, to protect or insulate said utility lines while performing work. All associated costs for this work shall be borne solely by the CONTRACTOR and included in the price paid for construction of traffic signal and safety lighting facilities and no additional compensation will be allowed.

4 Schedule of Values

Schedule of Values shall conform to the provision in Section 9-1.16B, "Schedule of Values," of the Standard Specifications, except as amended herein and in the Special Provisions.

CONTRACTOR is to submit a schedule of values within 15 days after Award of Contract.

The schedule of values must include as a minimum type, size, and installation method for:

1. Controller Unit
2. Controller Cabinet with Foundation
3. Standards and Poles with Foundations
4. Conduit (per size)
5. Pull Boxes
6. Conductors and Cables
7. Service Meter Enclosure(s)
8. Signal Heads and Hardware

9. Pedestrian Signal Heads and Hardware
10. Pedestrian Push Buttons/APS
11. Internally Illuminated Street Name Signs
12. Loop Detectors/Video Detection System
13. Luminaires
14. Traffic Signs and Hardware
15. Fiber Optic Cable and Various Associated Electronic Equipment (Individually)

~~The fifth Paragraph of Section 9-1.16B, "Schedule of Values," shall be deleted. For changed quantities of the work units listed, the CITY adjusts payments in the same manner as specified for changed quantities of bid items under Section 9, "Measurement and Payment" of the GREENBOOK.~~

5 Equipment List and Drawings

Equipment list and drawings of electrical equipment and material shall conform to the provisions in Section 86-1.01C, "Submittals," of the Standard Specifications, except as amended herein and in the Special Provisions. Sections 1.01C(2) thru 1.01(10) shall not apply.

Replace paragraphs 1st and 2nd of Section 1.01C(1), "General," with the following:

CONTRACTOR acknowledges and agrees that time is of the essence in the performance of work provided in the AGREEMENT. CONTRACTOR agrees that the following listed traffic signal submittals shall be delivered to CITY by CONTRACTOR on or before the fifteenth (15th) calendar day (Submittal Deadline Date) following the Notice of Award of Contract. In the event said submittals are not received by CITY on or before said Submittal Deadline Date, CONTRACTOR agrees to the deduction of one (1) working day from the number of Contract Completion Days for every day in delay of receipt by CITY of the submittals beyond the Submittal Deadline Date.

Submittal Items
1. Traffic Signal Controller Unit (Section 15)
2. Vehicle LED Indications (Section 17)

Upon the notification to the CONTRACTOR that the submittals are approved, the CONTRACTOR shall order materials within five (5) working days and provide proof of purchase order to the ENGINEER. No extensions of time for materials delay will be allowed without this proof.

For traffic signal equipment and material not listed above, submit a certificate of compliance with Caltrans Standard Specifications to the Public Works Construction Services ENGINEER.

The CONTRACTOR shall order the traffic signal poles on or before expiration of ten (10) working days following the Notice of Award of Contract. Proof of purchase order, including delivery date, shall be submitted to the ENGINEER. No extensions of time for materials delay will be allowed without this proof. Storage of traffic signal poles shall be

the responsibly of the CONTRACTOR. Payment for transporting, storage or relocation of traffic signal poles shall be considered included in the contract bid price paid for construction of traffic signal and safety lighting facilities. No additional compensation will be allowed therefore.

After paragraph 5 of Section 1.01C(1), "General," add the following:

The controller cabinet schematic wiring diagram and intersection sketch shall be on 24"x36" size sheets, or larger, and shall be drawn in sufficiently large scale to be clearly readable by field technicians. Partial schematic diagrams of the basic cabinet wiring on smaller sheets will not be accepted. The CONTRACTOR shall furnish maintenance manual and operations manual for all controller units; controller cabinet auxiliary, accessory and detection equipment; and signal communication provided under this CONTRACT. The manuals shall be submitted at the time of the controller assemblies are delivered for testing, or prior to purchase, if requested so by the Engineer. Product information sheets or cut sheets shall not be acceptable for either maintenance or operation manuals.

The eight paragraph of Section 1.01C(1), "General," shall be revised to read as follows:

"When request by the FIELD ENGINEER, submit a manufacturer's maintenance manual or combined maintenance and operation manual as an informational submittal."

After the last paragraph of Section 1.01C(1), "General," add the following:

During the course of construction, the CONTRACTOR shall prepare and submit redlined "As-Built" progress PLANS to the ENGINEER at regular time intervals established by the ENGINEER at the project's pre-construction meeting. These progress PLANS shall show any deviations from the original PLANS.

At the completion of all construction and testing, the CONTRACTOR shall prepare and submit a complete set of redlined "As-Built" PLANS for the project. These PLANS shall show all deviations from the original PLANS.

The "As-Built" PLANS must be approved by the ENGINEER prior to final acceptance. Payment for conformance to the requirements of this section shall be deemed included in the contract price for construction of traffic signal and safety lighting facilities and no additional compensation will be allowed.

6 Maintaining Existing and Temporary Electrical Systems

Maintaining existing and temporary electrical systems shall conform to the provisions in Section 87-20, "Temporary Electrical Systems," and Section 87-21, "Maintaining Existing Electrical Systems," of the Standard Specifications, except as amended herein and in the Special Provisions.

After the last paragraph of Section 87-21.01, "General," add the following text:

Maintenance of the existing traffic signals, street lighting, signs or approved temporary replacements shall be the responsibility of the CONTRACTOR. The CONTRACTOR shall provide a twenty-four (24) hour number where any intersection problem can be reported. He will have one (1) hour in which to respond to the maintenance call. Unless permission has been granted by the ENGINEER, the intersection shall not be left on flash more than two (2) hours. Existing streetlights shall remain in operation during construction and until the new lighting system is in operation.

CONTRACTOR must replace any inductive loop detectors he/she has damaged within 72 hours, or the CITY reserves the right to replace and deduct the cost.

All work to be done in connection with the modification of traffic signals shall be performed in such a manner that the signals shall be in continuous operation except for one (1) hour period between the hours of 8:30 AM and 3:30 PM on weekdays when they may be turned off for necessary work. Work requiring longer periods of time must be authorized by the ENGINEER. The placement of any temporary wiring necessary to maintain traffic signal operations shall provide a minimum of 18' vertical clearance for vehicles and a minimum of 10' over pedestrian areas. All safety regulations and precautions shall be observed in the installation work.

At those locations where the existing pole and foundation conflict and must be removed to allow for installation of the new pole and foundation, temporary signals shall be constructed. Poles may be supported by attaching a metal base plate of sufficient size and weighted to prevent tipping. The temporary signal shall remain in operation until the new signal is placed into operation.

Configuration of temporary signal facilities shall conform to the requirements of the MUTCD. A minimum of two (2) clearly visible signal faces shall be provided for traffic from each signalized movement, one being adjacent to the right side of the travel way. At major intersections temporary mast arm signal indications shall be required and any additional signal equipment as determined by the ENGINEER.

It is the CONTRACTORS responsibility to perform a pre-bid site survey to identify temporary signal facility requirements to maintain signal operations for the work shown on the PLANS to include costs in his/her bid

48 hours prior to any turn-on, shutdown or flashing condition of the traffic signals, the CONTRACTOR shall notify the ENGINEER of his anticipated schedule.

During the shutdown, the CONTRACTOR shall provide a minimum of two (2) standard 36" stop signs placed on each approach of the intersection to the satisfaction of the Engineer. The CONTRACTOR shall make arrangements with the Police Department for traffic control if deemed necessary by the ENGINEER.

Existing traffic signal systems shall not be placed in proposed phasing operation until all equipment is installed and pavement markings are complete.

All signal indications, pedestrian push buttons, detectors and control equipment shall be maintained in operation except during shutdown hours as specified above.

~~Full compensation of maintaining existing and temporary electrical systems shall be considered as included in the price paid for construction of traffic signal and safety lighting facilities and no additional compensation will be allowed.~~

7 Foundations

Foundations for signal standards, posts, cabinets, and pedestals shall conform to the applicable provisions in Section 87-1.03E(3), "Concrete Pads, Foundations, and Pedestals" and Section 56-3.01C(2), "Foundations", of the Standard Specifications except as amended herein and in the Special Provisions.

Portland cement concrete shall conform to Section 90, "Concrete," of the Standard Specifications, and to Section 90-2, "Minor Concrete" where applicable. Concrete for reinforced CIDH pile foundations shall contain not less than 590 pounds of cementitious material per cubic yard.

The CONTRACTOR must notify the ENGINEER 24 hours prior to any foundation pours so test cylinders may be made. All foundations poured without the ENGINEER present shall be automatically rejected. The CONTRACTOR, at his expense, shall remove and replace rejected foundations.

Foundations shall set a minimum of seven days before posts, poles, standards, pedestals or cabinets are set.

Where an array of underground conduits exist, the CONTRACTOR shall hand excavate said site in a careful manner so as to preserve existing conduits. Existing conduits, which are disturbed by the foundation placement, shall be rerouted. The CONTRACTOR shall not encase any existing conduits in the new foundations. If existing conduits are damaged by the CONTRACTOR, they shall be repaired or replaced as determined by the ENGINEER at the CONTRACTOR's expense.

Foundation excavations shall not be prepared and left open for more than 48 hours before concrete pour.

All unused foundations shall be removed completely and disposed, unless otherwise allowed by the Public Works Construction Services Manager to be abandoned. Abandoned foundations shall comply with Paragraph 16 of Section 56-3.01C(2), "Foundations" of the Standard Specifications.

The top of foundation for signal controller cabinet(s) shall extend 12-inch above finish or surrounding (unimproved areas) grade. Conduit risers entering the controller or communication cabinet foundation floor shall not conflict with the any lower center support members of said cabinet. All non-conforming foundations shall be rejected, removed completely and re-poured at the contractor's expense.

Where traffic signal controller cabinet(s) are located in landscaped or unimproved areas, the CONTRACTOR shall construct a raised concrete maintenance work pad and access path to one side and in front (door side) of the cabinet. The work pad must be the width of the proposed foundation, 5' feet on one side and 5' in front of the proposed cabinet, joining flush with the existing adjacent sidewalk. Payment for concrete maintenance work pad shall be considered as included in the price paid for construction of traffic signal and safety lighting facilities and no additional compensation will be allowed.

The materials, proportioning, mixing, slump, air-entrainment, transporting and curing of concrete shall be in accordance with the provisions of Section 90, of the Standard Specifications.

Reinforcing bars and steel wire placed in concrete foundations shall be in accordance with Section 52, "Reinforcement," of the Standard Specifications.

8 Standards, Poles, Pedestals, and Posts

Standards, poles, pedestals, and posts shall conform to the provisions in Section 86-1.02J, Section 87-1.03J and Section 56-3 of the Standard Specifications and Standard Plans, except as amended herein and in the Special Provisions.

It is the CONTRACTOR responsibility to ensure that all standards, poles, pedestals, and posts provided under this CONTRACT conform to the project PLANS. The CITY will not review or approve submittals useless otherwise specified on the Project PLANS or herein these specifications.

The final location of all standards, poles, pedestals and posts shall be approved in the field by the ENGINEER.

Signal standard installation shall maintain a 3' minimum clearance from centerline of standard to face of curb unless otherwise shown on the PLANS or directed by the ENGINEER.

Signal standards and mast arms shall be the designed per dimensions specified in the Standard Plans, unless otherwise noted on the PLANS. Slip-fit mast arms, truss arms and tie rods shall not be used with mast arm installation.

Any pipe tenons unused, or intended specifically for future use, shall be securely capped as directed by the ENGINEER. Mast arms delivered with unneeded pipe tenons shall be rejected.

Standards shall be manufactured and installed as such that the handhole access faces the downstream direction of vehicular travel.

CONTRACTOR shall ensure each standard is delivered from the manufacturer equipped with an identification tag in strict accordance with the Section 56-3.01C(3) of the Standard Specifications and Standard Plan ES-7M.

Plumbing of the standards shall be accomplished by adjusting the nuts on the anchor bolts before the foundation mortar cap is placed. Shims or other similar devices for plumbing the standard or raking will not be permitted. After plumbing the standard, anchor bolts shall be cut off 0.250-inch above the nuts. Repair newly exposed or damaged galvanized surfaces in accordance to the provisions in Section 75-1.02B, "Galvanizing," of the Standard Specifications.

The CONTRACTOR shall furnish and install all intersection signs on standards as shown on the PLANS and per the Special Provisions to the satisfaction of the Engineer.

~~Payment for furnishing, installing, transporting, storage or relocation of traffic signal poles shall be considered included in the contract bid price paid for construction of traffic signal and safety lighting facilities. No additional compensation will be allowed.~~

9 Conduit

Conduit shall conform to the provisions of Sections 86-1.02B, "Conduit and Accessories," and 87-1.03 "Construction" of the Standard Specifications, except as amended herein and in the Special Provisions.

Traffic signal conduit shall be 2½" nominal size unless otherwise specified on the construction PLANS.

Section 87-1.03B(1), Paragraph 8, Item 4, is revised to read as follows: *"4 inches from controller cabinet to adjacent pull box"*, and Item 7 is hereby deleted.

Conduit may be either Type 1 or Type 2. Type 3 non-metallic conduit and fittings shall not be used unless specifically noted on the construction PLANS. Where allowed, all non-metallic conduit shall be rigid, extra heavy wall schedule 80 polyvinyl chloride (PVC). The conduit shall conform to the requirements set forth in the NEMA Standard Specification TC-2 for electrical plastic conduit EPC-80.

Conduit termination in a pull box shall be of the same materials.

The first and last paragraphs of Section 87-1.03B(3)b, "Conduit Installation Under Paved Surfaces," shall be deleted.

All conduit runs under roadways shall be installed by approved boring, jacking or directional drilling methods only.

Conduit runs under some areas of A.C. pavement or dirt parkways may be installed by the trenching methods with permission of the ENGINEER. Material and compaction for backfill shall be as specified by the ENGINEER. The fourth paragraph of Section 87-1.03B(6) is hereby deleted. Use of rock-cutting excavators (rock wheel) shall not be allowed.

The CONTRACTOR shall notify the ENGINEER immediately of any foreseen necessity to use trenching methods (open cut) in any portion of the street right-of-way.

All trench, bore pit, and pilot hole excavations within paved roadways shall be backfilled and capped in conformance with City of Anaheim Standard Detail No. 132, no exceptions.

A duct sealant satisfactory to the ENGINEER shall be applied around underground conduit terminating inside the traffic controller cabinet at the point where the conduit enters the cabinet to prevent moisture intrusion.

10 Pull Boxes

Pull boxes shall conform to the provisions in Section 86-1.01C(2), "Pull Boxes"; Section 86-1.02C, "Pull Boxes"; and Section 87-1.03C, Installation of Pull Boxes," of the Standard Specifications, Standard Plans, except as amended herein and in the Special Provisions.

Section 86-1.01C(2), "Pull Boxes," is revised to read as follows: *"CONTRACTOR to submit Certificates of Compliance for pull boxes as directed by the ENGINEER."*

The Second Paragraph of Section 86-1.02C(1), "General" is revised to read as follows, and the third paragraph is hereby deleted"

"Cover marking must be one of the following:

1. *"TRAFFIC SIGNAL" for a signal and safety lighting system*
2. *"TRAFFIC FIBER" for an traffic signal fiber optic communication conduit and cable system*
3. *"TRAFFIC CMS" for a changeable message sign system*
4. *"ANAHEIM ELECTRIC" for signal service circuits between the service source point and service meter pedestal disconnect*
5. *"STREET LIGHT" for street lighting system*

Plastic pull boxes shall not be used.

Pull box covers/lids shall be made of lightweight polymer concrete. Pull box and cover must comply with ANSI/SCTE 77, "Specification for Underground Enclosure Integrity," for Tier 22 load rating.

The pull boxes shown on the construction PLANS are to be installed as a minimum. The CONTRACTOR may, at his own expense, install additional or large pull boxes to facilitate his work with the approval of the ENGINEER.

Pull boxes shall be No. 6 unless noted otherwise on the construction PLANS. Pull boxes installed at locations immediately adjacent to the controller cabinet shall be No.6E unless otherwise specified by the ENGINEER.

Pull boxes shall not be installed in any part of pedestrian access ramps or driveways.

Traffic bearing pull boxes with metallic lids shall not be permitted unless otherwise shown on the construction PLANS.

11 Conductors, Cables and Wiring

Conductors, cables and wiring shall conform to the provisions in Section 86-1.02F, "Conductors and Cables," Section 87-1.03F, "Conductors and Cable Installation," Section 87-1.03H, "Conductor and Cable Splices," and 87-1.03I, "Connectors and Terminals of the Standard Specifications, except as amended herein and in the Special Provisions.

Loop Detector Lead-in Cable (DLC) shall be Type B. Inductive loop conductors shall be Type 2.

Service and street lighting conductors shall be in accordance with the City of Anaheim Public Utilities Department's requirements.

Three feet of slack shall be provided for each conductor or cable in each pull box.

Where new conductors are to be added to existing conductors in a conduit, the CONTRACTOR shall:

1. Pull out existing conductors from the conduit and test the conductors for any defects per the Standards Specifications.
2. Clean the conduit per Section 87-1.03 of the Standard Specifications.
3. Replace all defective conductors with new conductors. Replacement of damaged conductors will be made by the CONTRACTOR. Compensation will be granted for the replacement of the conductors in accordance with Section 3-3 "Extra Work," of the "GREENBOOK, Standard Specifications for Public works Construction, 2015 Edition.
4. Pull both the old and new conductors into the conduit as a unit.

No splices shall be made in conduits, unless specified otherwise on the PLANS or by permission of the ENGINEER. Splices will be permitted only in the following types of circuits at the following locations:

1. Grounding signal light conductors in pull boxes.
2. Accessible pedestrian signal and push button conductors in a pull box.
3. Multiple lighting conductors in bases of standards or in pull boxes.

Color coding for conductors to pedestrian signals shall be black for pedestrian phases 2 and 6, orange for pedestrian phases 4 and 8, yellow for pedestrian phases 1 and 5, violet for pedestrian phases 3 and 7. A red stripe conductor is to be added for "Don't Walk" and a green stripe conductor for "Walk" indications.

The CONTRACTOR shall install new conductors where the PLANS designate that the existing conductors are to be "replaced".

Unless otherwise specified or permitted by the ENGINEER there will be no looping of phase wires between poles.

The CONTRACTOR may install signal cable or individual field wires. However, extra work to increase the conduit size shown on the PLANS, or for installation of new additional conduits to install cable shall not be granted. A conductor cable layout shall be submitted to the ENGINEER for approval.

Section 86-1.02F(2)(d)(v), "Signal Interconnect Cables," of the Standard Specifications is hereby deleted. CONTRACTOR shall refer to the City of Anaheim's Signal System Communication Specifications for signal interconnect cable requirements. Cable installation shall conform to the requirements of Section 87-1.03F(2)(c)(iv) of the Standard Specifications and the City of Anaheim's Signal System Communication Specifications.

12 Bonding and Grounding

Bonding and Grounding shall conform to the provisions in Sections 86-1.02F(2)(c)(ii), " Bonding Jumpers and Equipment Grounding Conductors"; 86-1.02O, "Grounding Electrodes"; 87-1.03F(3)(c), "Copper Conductors"; 87-1.03J, "Standards, Poles, Pedestals, and Posts"; and 87-1.03O, "Grounding Electrodes" of the Standard Specifications, except as amended herein and in the Special Provisions.

Grounding jumper shall be attached by a 3/16-inch or larger brass bolt in the standard or pedestal and shall be run to the conduit, ground rod or bonding wire in adjacent pull box.

Bonding jumper shall be visible after the cap has been placed on foundation.

Bond and ground metal service conduit as specified in NEC and by the Anaheim Public Utilities Department or service utility owner requirements.

Bonding where non-metallic type conduits are allowed by the ENGINEER, a #6 gauge copper wire shall be run continuously in circuits used for series lighting, and a #10 copper wire shall be run continuously in all other circuits. Equipment bonding and grounding conductors are not required in conduits which contain only loop lead-in cable.

13 Service

Existing electrical service meter pedestal to remain. Protect in Place.

14 Testing

Acceptance of new or modified traffic signal will be made only after all traffic signal circuits have been thoroughly tested. Perform functional test to show that each part of the system functions as specified.

The ENGINEER/Traffic Engineer shall be notified, in writing, at least five (5) days prior to the intended "turn-on" and beginning of signal operational test.

Turn-on of the new or modified traffic signal system to start the required five (5) day operational test shall not start on a Friday, Saturday, Sunday, holiday or any day proceeding a holiday. No exceptions will be made.

Before starting the operational test for systems that impact traffic, the system must be ready for operation, all equipment, and wiring as shown on the PLANS, shall be installed and operable. A qualified representative of the CONTRACTOR shall be present to immediately correct any deficiencies (i.e., loop wiring, signal wiring, head adjustments, etc.) that arise subsequent to the turn-on. All louvers, hoods and signal heads must be aligned to provide proper visibility. All signs, striping and pavement markings as required on the PLANS shall be in place at the location prior to turn-on.

The CONTRACTOR shall arrange to have a CITY signal technician to work on controller and the controller cabinet manufacturer, or his representative, present at the time the equipment is turned-on during the first day of the operational test and upon completion of the field installation.

~~Payment for conformance to this section shall be considered as included in the price paid for construction of traffic signal and safety lighting facilities and no additional compensation will be allowed.~~

15 Solid State Actuated Controller

Controller unit(s) shall conform to the provisions of the 2009 Caltrans Standard Transportation Electrical Equipment Specifications (TEES) for TS1 or 33x style cabinets, except as amended herein and in the Special Provisions.

Installation of controller unit(s) shall be completed by CITY forces. The CONTRACTOR shall provide, in writing, the time and date of signal turn-on to the Field/Traffic Engineer a minimum of five (5) working days prior to said signal turn-on.

The controller unit(s) shall be delivered to the CITY with new controller cabinet(s) as a complete assembly for programming. Arrangements for the delivery of the controller(s) and/or cabinet assemblies shall be in accordance with, Section 16, “Controller Cabinet,” of these Specifications.

The CITY Traffic Engineer will deliver the controller unit to the CONTRACTOR at the field site one hour prior to signal turn-on.

~~Payment for conformance to the provisions of this section shall be considered as included in the lump sum price paid for construction of traffic signal and safety lighting facilities and no additional compensation will be allowed.~~

The CITY requires Model 2070LN or 2070L type controller or pre-tested and pre-approved equal be provided under this CONTRACT. The CITY will consider the NEMA controller equivalent provided that the equipment complies with the definitions of interoperability and interchangeability as defined by NTCIP 9001. CONTRACTOR furnished controller equipment shall be delivered to CITY for operations integrity testing with CITY's cabinet equipment and communications compatibility testing with the designated central traffic control servers and communication system at the TMC.

The CONTRACTOR shall furnish and submit to CITY for testing 2070LN (for NEMA TS 1 and/or TS 2 Type 2) or 2070L (for 33x type traffic signal cabinet with C1 type connector) traffic signal controller equipment that complies with the 2009 edition of the CALTRANS TEES. Unless noted otherwise, the CITY does not use VME card cage assembly, 2070-6 or 2070-7 type modules in its 2070 hardware assembly.

This specification covers the following two versions of 2070/NEMA Standard Controller Units:

- NEMA TS 1/TS 2 Type 2 Cabinet Standard - Model 2070LN Controller Unit, and
- 33x Cabinet Standard - Model 2070L Controller Unit.

The Model 2070LN Controller Unit (for NEMA TS-1 type cabinet) consists of:

- 2070-1C .....CPU Module
- 2070-2B .....Field I/O Module
- 2070-3B .....Front Panel Module
- 2070-4N (A) .....Power Supply Module
- 2070-8.....Field I/O Module (NEMA)

The Model 2070L Controller Unit (for 33x type cabinet) consists of:

- 2070-1C CPU Module
- 2070-2A Field I/O Module
- 2070-3B .....Front Panel Module
- 2070-4N (A).....Power Supply Module

Unless noted otherwise, the CONTRACTOR shall furnish the controller hardware with CITY pre-approved traffic control software. In addition, the CONTRACTOR shall be responsible that the furnished 2070L hardware and software shall meet or exceed the requirements set forth in Sections 15.1 and 15.2.

15.1 2070LN Hardware Interchangeability Requirements

At minimum, the 2070L modules in the furnished 2070L controller assembly shall be interchangeable, fully compatible and operational with other 2070L modules in a 2070L controller assembly from at least one other controller manufacturer. For example, for

Manufacturer A's 2070L assembly to be compliant with this requirement, a 2070-1C CPU module with software from Manufacturer A shall be interchangeable, fully compatible and operational with Manufacturers B, C, etc., and vice versa. This example presumes that Manufacturers B, C, etc. already met this requirement with each other.

The CITY will test and verify for hardware interchangeability and compatibility among at least two controller manufacturers prior to product receiving approval for acceptance.

15.1.2 2070-1x Hardware Interchangeability Requirement

2070-1C interchangeability testing will be done by removing and swapping out the 2070-1C board under consideration with other controller assemblies and running that 2070L controller assembly for period of not less than 48 hours in the test cabinet under a pre-timed, 8-phase, 4-pedestrian configuration with resistive load. In a similar manner, other 2070-1x boards will be installed in the 2070L controller assembly that is under consideration. The subject 2070L controller assembly is considered "qualified" when its 2070-1x board operates glitch-free for a period of not less than 48 hours.

15.2 Software Interoperability Requirements

At minimum, the software running in the furnished 2070L controller assembly shall be fully compatible and operational in a 2070L controller assembly from at least one other controller manufacturer. For example, for Manufacturer A's software to be compliant with this requirement, the CITY shall be able to install and fully operate Manufacturer A's software on a 2070L controller assembly from Manufacturers B, C, etc., and vice versa. This example presumes that software from Manufacturers B, C, etc. already met this requirement with each other.

The CITY will test and verify for software operability and compatibility among at least two controller manufacturers prior to product receiving approval for acceptance.

15.2.1 Anaheim Start-Up Sequence

All traffic control software shall integrate, without exception, the Anaheim Start-Up Sequence as part of its start-up routine. The Anaheim Start-Up Sequence occurs at controller power on (boot) time and may occur at other intervals as required. Contact TMC for more information regarding this software requirement.

15.2.2 2070LN Controller with ASC-3 Software

The CITY accepts Econolite's ASC-3 traffic control software that is compliant with the NTCIP requirements in Section 15.3. The CONTRACTOR shall submit product specifications to the ENGINEER for controller and software approval prior to purchase. The CONTRACTOR shall be responsible for the full controller assembly that properly operates ASC-3 and is fully compatible with the CITY's traffic control system.

ASC/3 software, post version 2.65, using NTCIP protocol shall be compliant with the software interoperability requirements in Section 15.2 and NTCIP requirements in Section 15.3.

15.3 NTCIP Requirements

The following is an excerpt from Section 1.2 of the NTCIP 9001 document:

"The transportation industry has had a history of deploying systems with unique data definitions and proprietary communications protocols. Field devices and systems from one manufacturer or developer were not interoperable with those of other manufacturers or developers. As a result, expansion of the system after initial deployment can generally only be done using equipment of the same type and usually the same brand as in the initial deployment, unless there are investments in major systems integration efforts.

With proprietary protocols, there is little to no opportunity for realistic competitive bidding as additional field devices are added to the system, due to the lack of interchangeability. Nor, is there any opportunity for realistic competitive bidding to add additional types of field devices to the system, due to the lack of interoperability."

The CITY's goal is to have increased flexibility and choices among equipment of different types and different manufacturers by procuring products and equipment that are compliant with NTCIP standards.

Interoperability - Interoperability reflects the ability of multiple center systems and devices of different types to exchange information for some common purpose. Interoperability allows system components from different vendors to communicate with each other to provide system functions and to work together as a whole system. For example, using the same communications infrastructure to interconnect a management system with traffic signal controllers, dynamic message signs, video surveillance controls and other devices to manage traffic reflects a real-world example of interoperability.

Interchangeability - Interchangeability reflects the capability to exchange devices of the same type on the same communications channel and have those devices interact with others devices of the same type using standards-based functions. With interchangeability, system components can be changed out (switched) with similar components from different vendors because they possess common functional and physical characteristics. An example of interchangeability is a signal controller from different manufacturers interacting with each other to provide traffic signal coordination along an arterial throughway.

16 Controller Cabinet

Controller Cabinet(s) shall conform to the provisions in Sections 86-1.02Q(1) and 87-1.03Q(1), "General," of the Standard Specifications, except as amended herein and in the Special Provisions.

Controller Cabinet shall be Type 333L and wired for eight (8) vehicular phases, four (4) pedestrian phases and two (2) overlap phases. Controller Cabinet shall be fully wired and

include all auxiliary equipment to control the signal indications and perform the intended signal operation as shown on the PLANS and included in these "Special Provisions". Controller Cabinet at a minimum shall include a 2010ECLOIP with Red Monitor harness, output file support for 16 loadswitches, 19" rack mount detector activation panel, 3 full depth shelves installed at the non-traffic control side of the cabinet, and rack-mount keyboard/document trays in both sides of the cabinet. The CONTRACTOR shall furnish and install a Tripp-Lite RS 1215-RA power strip inside the cabinet.

The ENGINEER shall determine the exact location of the cabinet, controller and appurtenances in the field.

The top of cabinet foundation shall extend 12-inch above finish or surrounding (unimproved areas) grade. Conduit risers entering the foundation floor shall not conflict with the cabinet's lower center support member. All non-conforming foundations shall be rejected, removed completely and re-poured at the contractor's expense.

Where traffic signal controller cabinet(s) are located in landscaped or unimproved areas, the CONTRACTOR shall construct a raised concrete maintenance work pad and access path to one side and in front (door side) of the cabinet. The work pad must be as wide as the proposed foundation, plus 5' feet on one side and 5' in front of the proposed cabinet, joining flush with the existing adjacent sidewalk. P.C.C. work pad shall conform to City Standard Detail No. 110-B.

~~Payment for furnishing and installing the cabinet, its foundation, P.C.C. work pad and all necessary auxiliary equipment shall be considered as included in the price paid for construction of the traffic signal and lighting facilities and no additional compensation will be made.~~

Testing shall conform to the provisions in Section 86-1.01D(3), "Department Acceptance," of the Standard Specifications, except as amended herein and in the Special Provisions. Replace the text in Section 86-1.01D(3), "Department Acceptance," with the following:

"Testing of the controller cabinet assembly shall be conducted by the City of Anaheim Traffic Engineering Division at no cost. Arrangements for scheduling the delivery and testing of the controller cabinet assembly are to be made by contacting Traffic Signal Maintenance staff at (714) 765-6913. The CONTRACTOR shall deliver each controller cabinet assembly identified for installation under this contract to the CITY's testing facility located at 400 E. Vermont Street, Anaheim. Controller cabinet assemblies shall be delivered within ten (10) working days after the issuance of the Notice to Proceed to allow sufficient time for testing. The CITY shall provide the CONTRACTOR with the test results and indicate passing or rejection of said controller cabinet(s). Cabinet(s) that are rejected shall either be corrected of all deficiencies as identified in the test results or replaced within fifteen (15) working days of notification of rejection. All rejected cabinet(s) shall be re-tested until a passing status is achieved. Passed controller cabinet(s) shall remain at the CITY testing facility until ready for installation in the field. A passing status does not constitute acceptance of said controller cabinet(s). Final acceptance shall be made only after:

a) completion of field installation, AND;

b) the provisions of Section 14, " Testing," of these Specifications are satisfied, AND;

c) any controller cabinet warranties have expired.

CONTRACTOR shall be responsible for all damage sustained as a result of a defective controller cabinet prior to final acceptance and all corrective action shall be performed at his/her expense."

Unless otherwise set forth in the Special Provisions, any delays in work sustained as a result of delay in initial cabinet manufacturing and delivery may be subject to time extension at the written request of the CONTRACTOR. Time extension for delays caused by the CONTRACTOR and/or MANUFACTURER's failure to provide a cabinet that meets the CITY's Specifications, or failure to correct deficiencies identified during the cabinet testing process shall not be allowed. Contract Working days and/or Liquidated damages shall be assessed accordingly.

~~Payment for transporting the controller cabinet(s) shall be considered included in the price paid for construction of traffic signal and safety lighting facilities and no additional compensation will be allowed.~~

16.1 Cabinet Construction

Cabinet construction shall conform to the provisions in Chapter 6, Section 2, "Housing Requirements" of the 2009 Edition of Caltrans Standard Transportation Electrical Equipment Specifications (TEES), except as amended herein and in the Special Provisions.

The Controller Cabinet shall be fabricated from 0.125" thick 5052-32H sheet aluminum alloy. All exterior seams shall be continuously welded and ground to a smooth finish. Cabinet inside and outside shall be free of burrs. There will be a sufficient slanting of the cabinet top from front to back to allow water to run off and prevent water accumulation.

The outside surface of the cabinet shall have a smooth, uniform, natural aluminum finish.

Stainless parts shall be Type 304 per ASTM requirements. Compound or continuous type cabinet door hinges are acceptable. Pop rivets shall not be used to mount anything to a cabinet wall where the rivet is accessible from the outside of the cabinet. Cabinet door bracket shall be continuously welded and not spot welded.

The cabinet rack on which the controller unit will reside shall be spaced at the minimum height required to accommodate the controller unit.

16.2 Cabinet Ventilation

Cabinet ventilation shall conform to the provisions in Section 6.2.4, "Ventilation," of the 2009 Caltrans Standard Transportation Electrical Equipment Specifications (TEES), except as amended herein and in the Special Provisions.

The last sentence of first paragraph of Subsection 6.2.4.3, “Electric Fan” shall be revised to read:

“The Model 333L, 342LX, 344LX and 346LX housing shall be equipped with two AC powered electric fans.”

Add the following after the first paragraph of Subsection 6.2.4.5, “Filter”:

“Each cabinet shall be provided with high quality three stage disposable air filter for air intake vents. The filter shall be multi-ply progressive density polyester with an odorless flame retardant non-migrating tackifier adhesive. Filter layers shall be heat sealed around an internal 10 gauge steel wire support. Self-sealing filter edges shall prevent dirty air bypass. All filters shall be UL 900 Class 2 listed. Filter performance shall conform to ASHRAE Standard 52.1.”

16.3 Cabinet Wiring

Cabinet wiring shall conform to the provisions in Chapter 6, Section 5, "Cabinet Wiring," of the 2009 Caltrans Standard Transportation Electrical Equipment Specifications (TEES), except as amended herein and in the Special Provisions.

All wiring supplied in the cabinet is to conform to Military Specification: MIL-W-16878D, Type B, No. 22 or larger. Ribbon cables with gold connectors can be used for terminal connections. Terminal connections shall be by the use of mechanically wrapping and soldering, or the use of solderless lugs with the proper crimping tool. The rear of the load bay shall be mechanically wrapped and soldered.

A minimum of 0.125-inch of tinned (soldered) wire shall protrude from hole of feed-through lugs. All integrated circuits (IC) shall be removable. There is to be no more than three terminated wires per individual terminal post. The following control circuits available in the controller shall be brought out to terminals to facilitate utilization of additional features in the future:

Pedestrian call inputs shall be routed directly to the ~~NEMA~~ controller unit. There shall not be any form of pedestrian isolation card. The return circuit for the pedestrian push button shall use controller logic ground. The logic ground shall be solely used for pedestrian calls. Field pedestrian pushbutton wires shall be wired to terminals 667-670 for pedestrian phases 2 through 8 respectively. Pedestrian return wires shall be wired to Terminals 671-672.

Each load switch shall have three (3) terminals such that three +120 V outputs are available as outputs. The vehicular load switch position shall include a terminal for Red, Yellow and Green outputs while pedestrian load switch position shall include a terminal for Don’t Walk, Pedestrian Clearance and Walk outputs.

The terminals shall be accessible without the need to move equipment stored on the shelves around. No terminals shall be located on the side of the cabinet behind the load bay.

All equipment cables shall be routed either around the interior side of the controller cabinet or under the rack upon which the appropriate equipment is sitting. No equipment cables will be allowed to hang across the interior of the cabinet.

16.4 Cabinet Accessories and Components (Assemblies)

Cabinet assemblies shall conform to the provisions in Chapter 6, Section 5, "Cabinet Wiring," of the 2009 Caltrans Standard Transportation Electrical Equipment Specifications (TEES), except as amended herein and in the Special Provisions.

All internal labeling in the cabinet shall be silk-screened. Adhesive labels shall not be permitted.

The "Stop Time-Off" switch shall be three-position toggle switch type. The three positions shall be "Off" to disable the stop time function, "Flash-Stop Time" to enable the stop time function when in the "Flash" position, and "On" to turn on the stop time function.

After the Flash switch is released from the “On” or “Flash” position, the controller shall initiate a controller start-up routine. This function shall also occur with the release of the Flash switch from the emergency/police panel.

Momentary contact switches shall be provided to place calls on each vehicle and pedestrian phase. The vehicle and pedestrian call test switches shall be three position toggle: constant call to the appropriate phase/pedestrian movement, the middle position shall be a no call position, and the bottom position shall be "Momentary On" to allow individual calls to the controller when the toggle is pushed down and released. Switches shall provide tactile feedback and shall be rated at 100 milliamps minimum, for a resistive load at 120-volts AC and at 28-volts DC. Contacts shall be gold.

The cabinet power panel shall be isolated from cabinet interior with a removable front cover and designed so as to allow the maintenance technician to access the main and auxiliary circuit breakers without removing the front cover. The power panel shall be equipped with five circuit breakers (Main 50-amp, Signal 40-amp, Auxiliary 15-amp, Video Detection/CCTV 20-amp and Fan 0.5-amp) conductors between the "Signal" circuit mercury contactor and the load bay shall be 8 AWG.

A separate 20-amp circuit breaker shall be provided to service video detection, CCTV and fiber optic equipment. A standard six-outlet surge-protected power strip shall be hardwired to the 20-amp breaker. Terminals 343-346 of the load bay shall be hardwired with AC+, AC– and Chassis Ground to provide service for video detection cameras.

16.4.1 Safety Monitor Requirements

This specification sets forth the minimum requirements for a shelf-mountable sixteen channel, solid-state safety monitor with Ethernet port for a NEMA TS-1 Traffic Cabinet Assembly. At a minimum, the safety monitor shall comply with all specifications outlined in Section 6 of NEMA STANDARD TS-1 1994 (Conflict Monitors). An independent testing laboratory shall verify that the monitor will perform all its defined functions under

the conditions set forth in Section 2 of NEMA STANDARD TS-1 1989 (Environmental Standards and Test Procedures). Each new traffic signal control cabinet assembly shall be furnished with a new EDI model MMU-16LEip SmartMonitor or approved equal. Where differences occur, this specification shall govern.

The Signal Monitor shall be capable of monitoring sixteen channels consisting of a Walk input, Green input, Yellow input, and Red input for each channel. The unit shall also include all of the functions described below:

1. HARDWARE FUNCTIONS

LED Indicators

All LED display indicators shall be mounted on the front panel of the Signal Monitor and shall be water clear, T-1 package, Super Bright type LEDs. All LEDs shall be red and shall be labeled and provide the information as follows:

1) POWER: The POWER indicator shall flash at a rate of 2 Hz when the unit has detected a low voltage condition as described in Section 3.3. It shall illuminate when the AC Line voltage level is restored above the brownout level. The indicator shall extinguish when the AC Line voltage is no longer sufficient to provide the DC voltages necessary for proper monitor operation (approximately 50 VAC).

2) MONITOR FAIL: The MONITOR FAIL indicator shall illuminate when one of the following faults are detected: Internal Watchdog fault; Memory Test fault; or Internal power supply fault. This indicator is intended to inform the service technician of a monitor hardware or firmware failure.

3) FAULT: The FAULT indicator shall illuminate when the unit has responded to a fault condition and has transferred the Output relay.

LCD Indicators

1) CONFLICT: The CONFLICT indicator shall illuminate when a conflicting proceed signal fault is detected.

2) RED FAIL: The RED FAIL indicator shall illuminate when an absence of signal is detected on a channel(s). If the Red Enable input is not active, the RE OFF indicator shall illuminate.

3) CVM / WD: The CVM (Controller Voltage Monitor) indicator shall illuminate when a Controller Voltage Monitor fault or external Watchdog fault is detected.

4) 24V-2: The 24V-2 indicator shall illuminate when a 24VDC-fault condition on the 24V Monitor input #2 is detected. This indicator remains extinguished if the monitor has not been triggered by a 24VDC fault.

5) 24V-1: The 24V-1 indicator shall illuminate when a 24VDC-fault condition on the 24V Monitor input #1 is detected. This indicator remains extinguished if the monitor has not

been triggered by a 24VDC fault.

6) BND: The BND indicator shall illuminate when a BND ERROR fault is detected on a channel(s).

7) DUAL INDICATION: The DUAL INDICATION indicator shall illuminate when a Dual Indication fault is detected on a channel(s).

8) CLEARANCE: The CLEARANCE indicator shall illuminate when the minimum Yellow Clearance time has not been met on a channel(s).

9) Rx: The Rx indicator shall illuminate when the RS-232 port has received a character.

10) Tx: The Tx indicator shall illuminate when the RS-232 port has transmitted a character.

11) CHANNEL STATUS: A separate indicator for each input of each channel shall display all active signals simultaneously. Additionally, one indicator per channel shall be provided which identifies a channel as being involved in an error condition, which has triggered the unit.

Front Panel Control

1) RESET Button: A momentary SPST Control switch labeled RESET shall be provided on the unit front panel to reset the monitor circuitry to a non-failed state. A reset command issued from either the front panel button or External Reset input shall be a one-time reset input to prevent the unit from constant reset due to a switch failure or constant external input, and shall cause all LED indicators to illuminate for 300 ms.

2. ELECTRONICS

Internal MPU Watchdog

A microprocessor shall be used for all timing and control functions. Continuing operation of the microprocessor shall be verified by an independent monitor circuit, which shall force the Output Relay to the de-energized "fault" state, and illuminate the MONITOR FAIL indicator if a pulse is not received from the microprocessor within 200 ms.

Sockets

In the interest of reliability, only the PROM memory device for the microprocessor firmware shall be socket mounted. The PROM memory socket shall be a precision screw machine type socket with a gold contact finish providing a reliable gas tight seal. Low insertion force sockets or sockets with "wiper" type contacts shall not be acceptable.

Internal Power Supply

A built-in, high-efficiency power supply shall generate all required internal voltages. All supply voltages shall be regulated and shall be monitored with control signals. Failure of the internal power supply to provide proper operating voltages shall force the Output Relay to the de-energized "fault" state and illuminate the MONITOR FAIL indicator. A user

replaceable slow blow fuse shall be provided for the AC Line input. The unit shall be operational over the AC Line voltage range of 75 VAC to 135 VAC.

Configuration Parameters

User-programmed configuration settings shall be selected using front panel mounted dip switches. Designs requiring a Personal Computer (PC) to program or verify the configuration parameters are not acceptable. User-programmed configuration settings which are transferred to memory shall be stored in a programmable read-only memory (PROM). Designs using a battery to maintain configuration data shall not be acceptable.

Field Terminal Inputs

All 120 VAC field terminal inputs shall provide an input impedance of 150K ±50K ohms and be terminated with a discrete resistor having a power dissipation rating of 0.5 Watts or greater. A separate, precision voltage comparator device shall sense each 120 VAC field terminal input.

In the interest of reliability and repair ability, the front panel MS connectors shall be MIL-C-26482 grade and not be directly mounted to the printed circuit board. A wire harness of 22 gauge minimum stranded wire shall be used.

2.1 RS232 Communications Port

The monitor unit shall have an RS-232C serial communications port to provide a means of transferring all monitor configuration data, previous failure data, AC+ power interruption data, compatible channel configuration and the date and time of the print out to an external serial printer or PC.

The RS-232C port shall be totally electrically isolated from the monitor unit except for the chassis connection.

2.2 Component Specifications

All electrical components used in the Signal Monitor shall be rated by the component manufacturer to operate beyond the full unit operating temperature range of -34°C to +74°C {-29° to 165°F} including the Liquid Crystal displays (LCD).

2.3 Printed Circuit Boards

All printed circuit boards shall meet the requirements of the NEMA STANDARD TS-1 1989, plus the following requirements to enhance reliability:

1) All plated-through holes and exposed circuit traces shall be plated with solder.
2) Both sides of the printed circuit board shall be covered with a solder mask material.
3) The circuit reference designation for all components and the polarity of all capacitors and diodes shall be clearly marked adjacent to the component. Pin #1 for all integrated circuit packages shall be designated on both sides of all printed circuit boards.

4) All electrical mating surfaces shall be gold plated.
5) All printed circuit board assemblies shall be coated on both sides with a clear moisture-proof and fungus-proof sealant.
6) All components and wire harnesses shall be mounted to the PCB using plated holes. "Piggy back" connections or jumper wires shall not be acceptable.

3 MONITOR FUNCTIONS

All fault timing shall be computed for each channel individually except for Conflict faults.

3.1 Conflict Monitoring

The Signal Monitor shall be able to detect the presence of conflicting green or yellow or walk signal voltages on the AC field terminals between two or more non-compatible channels. A Conflict fault (CONFLICT) shall be a latching fault.

3.2 Conflict Recognition Time

The Signal Monitor shall trigger when voltages on any conflicting channels are present for more than 450 ms. The Signal Monitor shall not trigger when voltages on any conflicting channels are present for less than 200 ms. Conflicting signals sensed for more than 200 ms and less than 450 ms may or may not trigger the unit.

24VDC Monitoring

The Signal Monitor shall be able to detect that the cabinet +24 VDC supply has fallen below 18 VDC. A Voltage Monitor Latch function shall be provided which will sense an improper voltage level at the Controller Voltage Monitor input or either of the +24V Monitor inputs and cause the unit to trigger. If this function is enabled via a front panel accessible programming device, restoration of the proper voltage levels will not reset the unit. Only a manual reset or external reset will reset the unit.

24VDC Recognition Time

The Signal Monitor shall trigger when the voltage on the +24V input is below 18 VDC for more than 200 ms. The Signal Monitor shall not trigger when the voltage on the +24V input is below 18 VDC for less than 100 ms. A voltage level of +22 VDC shall be required to prevent the unit from triggering.

24V-1 and 24V-2 LED Control

The 24V-1 and 24V-2 indicators shall illuminate when the unit has been triggered by a 24VDC fault. If the 24VDC monitoring function is inhibited due to the 24V Inhibit input being True, the 24V-1 and 24V-2 LEDs shall flash at a 0.5 Hz rate.

Controller Voltage Monitor (CVM)

The Signal Monitor shall trigger when the CVM input level goes False.

Controller Voltage Monitor Recognition Time

The Signal Monitor shall trigger when the voltage on the CVM input is False for more than 200 ms. The Signal Monitor shall not trigger when the voltage on the CVM input is False for less than 100 ms.

AC Line Brownout Recognition

The Signal Monitor shall be able to detect that the AC Line has fallen below 92 ±2 VAC for greater than 475 ±25 ms. This shall force the output Relay to the de-energized "fault" state and cause the POWER LED to flash at a 2 Hz rate. The unit shall maintain this state until the AC Line voltage rises above 100 ±2 VAC for greater than 100 ±17 ms.

AC Line Interrupt

When the Signal Monitor responds to a low AC Line condition, or a total AC Line interruption (see Section 3.1), the unit shall remain in the fault state with the Output Relay de-energized until the AC Line voltage returns above the restore level.

Dual Indication Monitoring

The Signal Monitor shall be able to detect the presence of active voltage on the yellow and (green or walk) inputs, or, red and (green or yellow or walk) field signal inputs of a channel. Front panel mounted switches shall program each of these modes. Dual Indication fault (DUAL INDICATION) shall be a latching fault. This function shall be enabled on a per channel basis using dip switches mounted on the front panel labeled ASSM@. The Dual Indication monitoring function shall be enabled for all selected channels except when the Red Enable input is not active.

GY Dual Indication Monitoring

The Signal Monitor shall be able to detect the presence of active voltage on the yellow and green field signal inputs of a channel. GY Dual Indication fault (DUAL INDICATION) shall be a latching fault. This function shall be enabled with a dip switch on the front panel labeled "GY ENABLE". When the switch is in the ON position, all channels shall be monitored for simultaneous active green and yellow inputs on a channel.

Dual Indication Recognition Time

The Signal Monitor shall trigger when multiple inputs are active on a channel for more than 500 ms. The Signal Monitor shall not trigger when multiple inputs are active on a channel for less than 250 ms. Channels with multiple voltages active for more than 250 ms and less than 500 ms may or may not trigger the unit.

Sequence (Short or Absent Yellow) Monitoring

The Signal Monitor shall be able to detect that a channel has not provided an adequate Yellow Clearance interval during a green to yellow to red sequence. A Sequence failure (SEQUENCE) shall be a latching fault. This function shall be enabled on a per channel basis using dip switches mounted on the front panel labeled "SSM." The Sequence monitoring function shall be enabled for all selected channels except when the Red Enable input is not active.

Sequence Recognition Time

The Yellow Clearance interval shall be 2.7 seconds plus 0.2 seconds.

Walk Disable Option

A Walk Disable function shall be provided which will modify operation of Red Fail monitoring. If this function is enabled via a front panel accessible programming device, the unit shall trigger if it senses the absence of active green, yellow, and red inputs of a channel regardless of the state of the walk input.

BND Error Monitoring

A Field Input monitoring function (BND) shall be provided to sense improper input waveforms on the field signal inputs. Improper inputs may result from irregularly rapidly blinking (flickering) inputs, constant extraneous noise, or dimming operations other than half-wave suppressed.

External Watchdog Monitoring

Absence of a logic input transition from the cabinet controller watchdog circuitry for 1500 ms (±100 ms) shall cause the unit to trigger. This function shall be enabled via a front panel accessible programming device.

Program Card Ajar

When the Programming Card is removed or not seated properly, the Signal Monitor shall force the Output Relay to the de-energized "fault" state and illuminate the PROGRAM CARD indicator. A reset command from the front panel Reset switch or External Reset input shall be required once the Program Card is in place.

4. DIAGNOSTIC & EVENT LOGGING FUNCTIONS

In addition to the normal display mode, it shall be possible to review the previous failure and ac line event logs as well as the configuration of the unit.

4.1 Real Time Clock

A real time clock shall be provided to mark the date and time when the unit is triggered by a fault condition. Backup power to the real time clock shall allow it to maintain timing accuracy during interruptions of AC+ power to the unit. Automatic adjustments should be made to the time of day and date to accommodate leap years and Daylight Savings time.

4.2 Previous Failure Event Log

The unit shall maintain a complete record of at least the last nine faults which caused the unit to trigger. These events shall be able to be reviewed at any time via activation of a front panel control. This fault record shall not be lost due to AC+ power interruptions.

4.3 AC Line Event Log

The unit shall maintain a complete record of at least the last nine AC+ power interruptions

and restorations. These events shall be able to be reviewed at any time via activation of a front panel control. This AC+ failure record shall not be lost due to AC+ power interruptions.

4.4 Program Card Verification

The monitor unit shall be capable of verifying the Program Card information by displaying the channels programmed as permissive in a sequential fashion for each channel monitored via a front panel control.

4.5 Configuration Verification

The monitor unit shall be capable of displaying the fault timing values being used to trigger the monitor for Conflicts, Red Failures, Controller Voltage Monitor (CVM) and 24V Monitor (24V-I & 24V-II) conditions, Dual Indications, Clearance Failures, and Controller Watchdog Failures (if enabled) via a front panel control. If any fault monitoring functions are disabled by control input Red Enable this shall be indicated. Channels which are selected for Dual Indication and Clearance monitoring via the front panel accessible programming devices shall also be displayed.

16.4.2 Cabinet Detection

Cabinet assemblies shall conform to the provisions in Chapter 5 "Specifications Detector Sensor Units, Elements and Isolators," of the 2009 Caltrans Standard Transportation Electrical Equipment Specifications (TEES), except as amended herein and in the Special Provisions.

Unless noted otherwise, the CONTRACTOR shall furnish all inductive loop detector equipment, including detector rack and power supply that meet or exceed the environmental, transient and size requirements of NEMA Standards TS1-1994 Section 15 and TS2-2003 Section 6.5, and shall meet the design, operation, electrical and functional performance requirements of these specifications. The detector rack power supply shall be rated to support a 10-slot detector rack fully configured for both video detection modules and inductive loop detectors. In addition, the CONTRACTOR shall supply at least one detector per detector rack that supports the audible detect signal (buzzer) to facilitate loop and detector troubleshooting.

The aforementioned NEMA and the following specifications constitute the minimum acceptable design, operational and functional performance requirements for high performance, multiple channel, inductive loop vehicle detectors. Detectors supplied to this specification shall have a manufacturer’s warranty to be free of defects in materials and workmanship for a period of not less than 2 years.

Equipment Specifications

The following are considered minimum inductive loop detector specifications:

- The detector unit shall be configured as a rack mounted printed circuit board for insertion into a NEMA TS-1 / TS-2 input rack with the following requirements:

Mechanical

Height.....4.50 inches
Width (Two Channel) .....1.20 inches
Width (Four Channel).....2.30 inches
Depth (excluding handle).....6.875 inches

Electrical Specifications

Power Supply: 10.8 to 28.8 VDC. 50 mA max per channel.

Tuning Range: 20 to 2500 uH Loop plus lead-in (approx. 15 to 60 kHz)

Q factor: 5 min.

Inputs: Low (True) less than 8 volts, High (False) greater than 16 Volts.

Call Output: Solid State optically isolated. "On" voltage shall be less than 1.5 Volts at 50 mA collector current.

Status and Count Outputs: 50 volts max collector voltage, "On" voltage less than 1.5 Volts with 50mA collector current.

Environmental

-34oC to + 74oC, humidity 95% max (non-condensing).

Minimum Functional Specifications

- The detector shall automatically self-tune and be operational within 2 seconds after application of power or after being reset. Full sensitivity and hold time require 30 seconds of operation.
- The detector unit shall, at minimum, display the occurrence of an open loop, shorted loop, or excess inductance change (> 25%). The type of error shall be displayed by a high intensity LED or approved equivalent display when the unit has detected a "shorted loop", "open loop" or "25% DL/L".
- The detector that supports the audible detect signal (buzzer) performs as follows. When the audible detect option is enabled (on), an audible signal will be activated whenever the detection zone for the selected channel is occupied such that the audible signal indicates actual occupancy of the loop detection zone.

17 Traffic Signal Faces and Fittings

Signal faces, signal heads, and mounting framework, as shown on the PLANS, and the installation thereof, shall conform to the provisions in Section 86-1.02R and 87-1.03R, "Signal Heads" of the Standard Specifications and Standard Plans No(s). ES-4A through ES-4E, except as amended herein and in the Special Provisions.

All signal faces shall be 12-inch equipped with "tunnel" visors and louvered back plates unless shown otherwise on the construction PLANS.

Signal head sections, visors, and back plates shall be metal. Plastic materials shall not be permitted. Paragraphs 3 and 4 of Section 86-1.02R(3), "Backplates", and Paragraph 4 of Section 86-1.02R(4) "Signal Faces" of the Standard Specifications are hereby deleted.

LED signal modules proposed for installation under this CONTRACT shall be listed on the Caltrans Authorized Material List for LED traffic signal modules at the below link:

https://dot.ca.gov/-/media/dot-media/programs/engineering/documents/mets/led-traffic-signal-module.pdf

Paragraphs 1 and 2 of Section 87-1.01D(2), "Quality Control," of the Standard Specifications shall be deleted.

The CONTRACTOR shall submit for the necessary product deliverables for each type of (i.e., red/yellow/green indication) LED modules proposed for installation for review and approval. Product deliverables shall consist of product information, which includes the manufacturer, model number, Specifications, wattage consumption, and a Certificate of Compliance with State Specifications.

LED modules shall be hard-wired to terminal block in signal housing compartment. Screw-in adapters shall not be allowed.

Programmed visibility signal sections shall not be used unless otherwise shown on the PLANS.

Signal head mountings with terminal compartments shall be used. All mountings shall be located to provide a minimum of 24-inch horizontal clearance from the edge of the signal visor or pedestrian head to the curb face. All terminal compartments shall be bronze.

Where signal heads are on the side of poles, the heads shall be mounted on the side away from the traveled roadway.

~~Costs for furnishing, transporting, installing vehicle signals, signal housings, LED modules, mounting assemblies and all necessary auxiliary equipment shall be considered as included in the bid price paid for construction of traffic signal and safety lighting facilities and no additional compensation will be allowed.~~

18 Pedestrian Signal Sections

Pedestrian signal heads and mounting equipment to remain. Protect in place.

19 Detectors

Loop detectors and amplifier units shall conform to the provisions in Sections 86-1.02F "Conductors and Cables"; 86-1.02W, "Loop Detector Sealant"; 87-1.03F "Conductor and Cable Installations"; 87-1.03V, "Detectors"; and Section 87-1.03W "Sealants" of the Standard Specifications and Plans, 2009 Caltrans Standard Transportation Electrical

Equipment Specifications (TEES) and City Standard Details; except as amended herein and in the Special Provisions.

The term “inductive loop detector” applies to a complete vehicle detection installation consisting of a conductor loop or group of loops installed in the roadway, steel conduit, pull boxes, Detector Lead-in Cable (DLC), and detector (amplifier) unit and power supply installed in a traffic signal controller cabinet.

Inductive loop detectors shall be Type “E” and consist of three turns of type 2 loop wire. Loop detector configuration and location shall be installed in accordance with City Standard Detail No. 410, and as shown on the PLANS. Loop detector layout shall be approved by the ENGINEER prior to installation by the CONTRACTOR. Header loops shall straddle the limit line or stop bar.

Loop DLC shall be “Type B”. All detector loop wires shall be joined as specified in Section 87-1.03I, "Connectors and Terminals," of the Standard Specifications or as approved by the ENGINEER. Splices in pull boxes shall be insulated as specified in Section 86-1.02H “Splicing Materials” and Section 87-1.03H “Conductor and Cable Splices," of the Standard Specifications. Each DLC shall be tagged with a plastic or aluminum label that specifies the phase. Each loop shall be identified in the pull box as to number and lane assignment. Tags will be furnished by the CONTRACTOR.

Loop conductors and sealant shall be installed on the same day as the loop slots are cut. All sealant for filling slots shall conform to the Standard Specifications. The sealant for filling slots in asphalt pavement shall be Hot-Melt Rubberized Asphalt Sealant. Elastomeric sealant shall be used only for filling slots in concrete cement.

Holes larger than 4-inches across left in the pavement due to loop installation shall be filled with hot mix asphalt concrete.

Where existing interconnect conduit is to be used for advanced/system loop detectors, the CONTRACTOR shall use extreme care not to damage the existing cables (i.e., twisted pair, fiber optic, sign control cable, etc.) when installing new DLC. Any existing cable damaged by the CONTRACTOR shall be replaced at his/her own expense.

All detector loops in a travel lane shall be series connected and all travel lanes shall be series connected up to a maximum of three (3) lanes per sensor unit, unless otherwise directed by the ENGINEER.

Preformed inductive loops shall not be allowed unless otherwise shown on the PLANS.

Detectors units and associated electronics shall be in accordance with Section 16.4.2, “Cabinet Detection,” of these Specifications.

Where video detection is installed at existing traffic signals, CONTRACTOR shall remove existing DLC that are no longer required from conduits.

Payment for conformance to the requirements of this section shall be considered as included in the bid price paid for construction of traffic signal and safety lighting facilities and no additional compensation will be allowed.

19.1 Video Image Detection System (VIDS)

Existing video image detection system to remain. Protect in place. Modification to detection zones by City-forces.

20 Pedestrian Push Buttons

Existing pedestrian push buttons to remain. Protect in place.

21 Luminaires

Luminaires for traffic signal safety lighting shall conform to the provisions in current City of Anaheim Public Utilities Department Electric Construction Standards, except as amended herein and in the Special Provisions.

Paragraphs 1 and 2 of Section 87-1.01D(2), "Quality Control," of the Standard Specifications shall be deleted.

The Luminaires to be installed shall be Light Emitting Diode (LED) type, 120/240V equivalent to 200 Watt, ±18,000 delivered Lumens, extra-wide asymmetric distribution and Correlated Color Temperature (CCT) of 3000K. All LED luminaires for installation under this contract shall be approved by the Public Utilities Representative. Contact Utilities Representative at 714-765-4122 for submittal requirements. Any luminaire installed without prior approval shall be rejected.

Luminaires shall be furnished with light engine, refractor or lens, housing and all appurtenances as a complete unit. The luminaire shall provide true ninety-degree (90°) cut-off with no light emitting above the 90° horizontal. The lower edge of the luminaire housing shall extend below the light source and all glassware. The provided lens shall clear and impact resistant. Glare shields external to the luminaries will not be accepted.

The luminaire optical assembly shall be a sealed chamber in accordance with the Standard Specification to prevent contamination from infiltration of gaseous and particular matter.

Provide Type V photoelectric control for luminaires.

The lamp socket shall be factory preset to produce an IES Type III Medium light distribution. Maximum brightness measurements must comply with the provisions of paragraph 14 of the Standard Specifications. The optical assembly door shall be designed to prevent the door from swinging free of the hinge pins when opened.

For CITY "street lighting" facilities, luminaires and appurtenances shall conform to latest revisions of the City of Anaheim Public Utilities Department's Electrical Specifications for Street Lighting Systems unless otherwise specified in the CONTRACT documents.

22 Internally Illuminated Street Name Signs

Existing Internally Illuminated Street Name Signs (IISNS) to remain. Protect in place.

23 Photoelectric Controls

Photoelectric controls shall conform to the provisions in Sections 86-1.02M and 87-1.03M, "Photoelectric Controls," of the Standard Specifications, except as amended herein and in the Special Provisions.

The photoelectric controls for luminaires shall be Type V and Type IV for Internally Illuminated Street Name Signs.

24 Removing, Reinstalling, or Salvaging Electrical

All work under this section shall conform to the provisions in Section 87-21, "Existing Electrical Systems," of the Standard Specifications, except as amended herein and in the Special Provisions.

The following materials or equipment designated for salvage in the construction PLANS, or as specified by the ENGINEER, will be removed or salvaged under this contract:

1) Traffic Signal Controller and Cabinet
2) Traffic Signs and Posts
3)

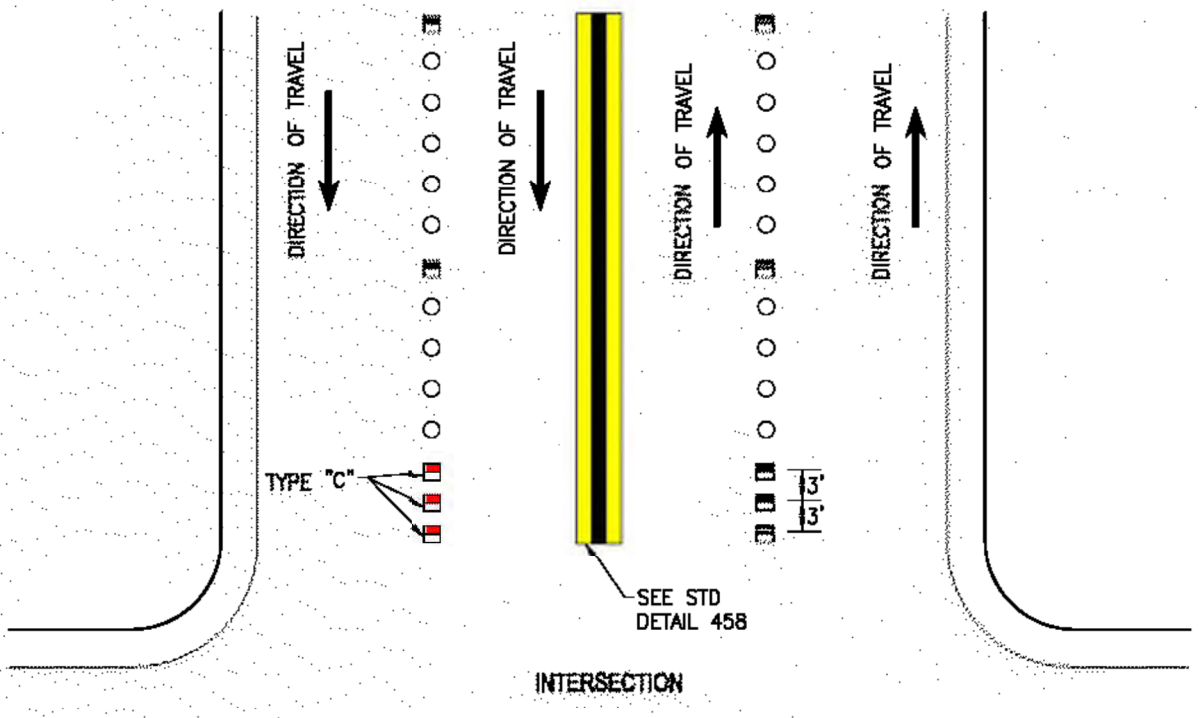
All salvaged materials or equipment shall be delivered to the City's Traffic Signal Maintenance Storage Facility (1581 N. Placentia Ave., Anaheim CA 92806) or the Utilities Maintenance Facility or Offices as directed by the Engineer. All other materials and equipment identified for removal, and not to be reused, shall become the property of the CONTRACTOR and disposed of in a timely manner.

Payment for salvaging, removing, reinstalling and disposing of electrical equipment shall be deemed to be included in the contract price bid for construction of traffic signal and safety lighting facilities and no additional compensation will be allowed.

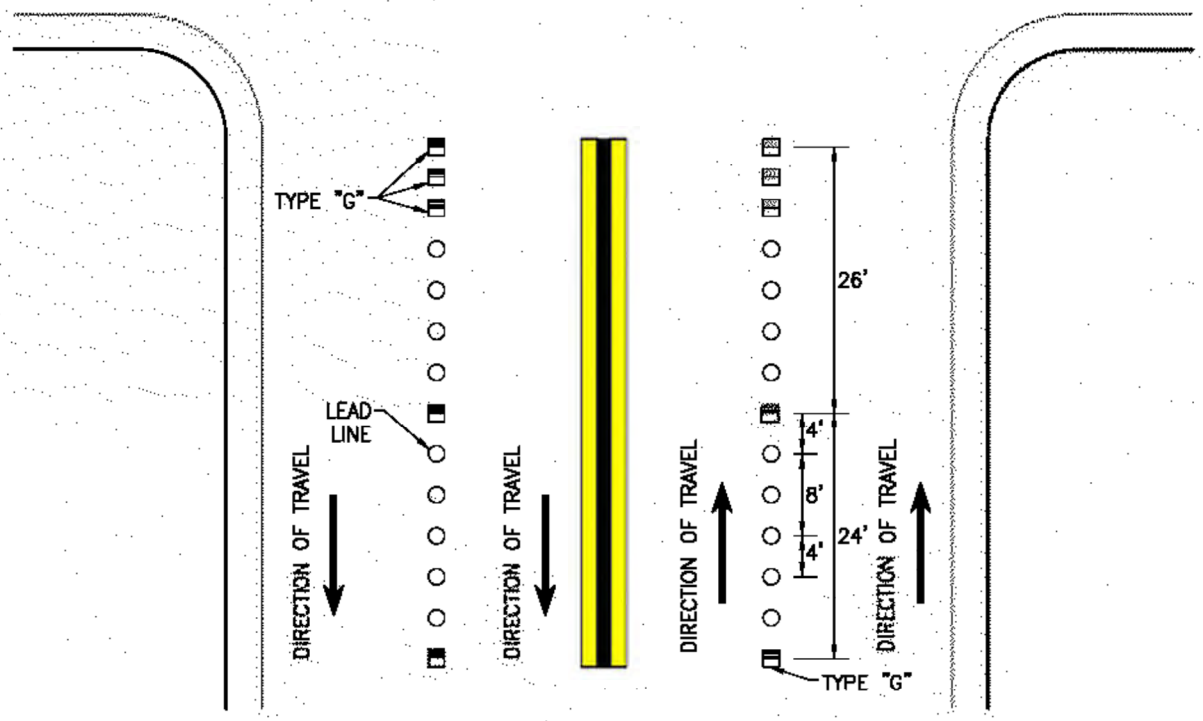
25 Payment

Payment shall conform to the provisions as set forth in the contract documents.

PAVEMENT MARKERS



INTERSECTION



SECONDARY ARTERIALS AND HIGHER SHALL USE BOTH PAINT AND PAVEMENT MARKERS.

— 4" WHITE STRIPE

○ — TYPE "A" NON-REFLECTIVE CERAMIC WHITE MARKER

▭ — TYPE "G" ONE-WAY CLEAR REFLECTIVE MARKER (HIGH INTENSITY)

▭ — TYPE "C" TWO-WAY RED REFLECTIVE MARKERS

INSTALLATION AND LAYOUT OF LANE LINE AT AN INTERSECTION

ANAHEIM

REVISIONS			
No.	DATE	No.	DATE
1	06/18	3	03/19

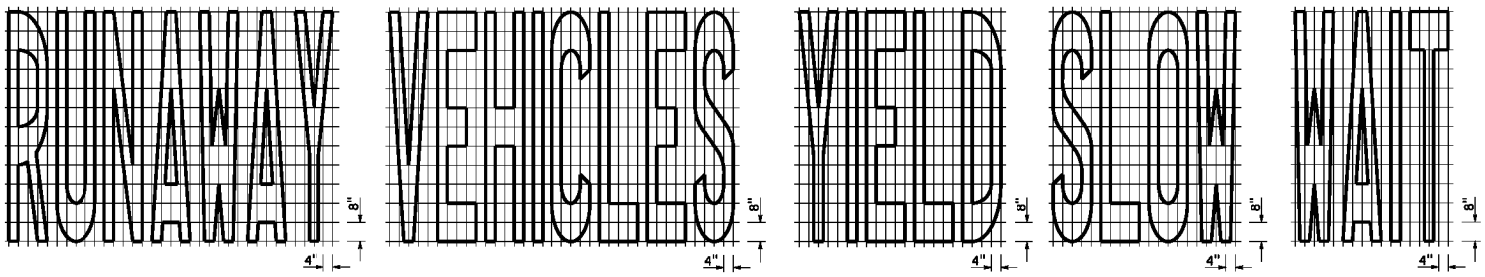
CITY ENGINEER — DATE 03/22/2019

DIRECTOR OF PUBLIC WORKS — DATE 03/22/2019

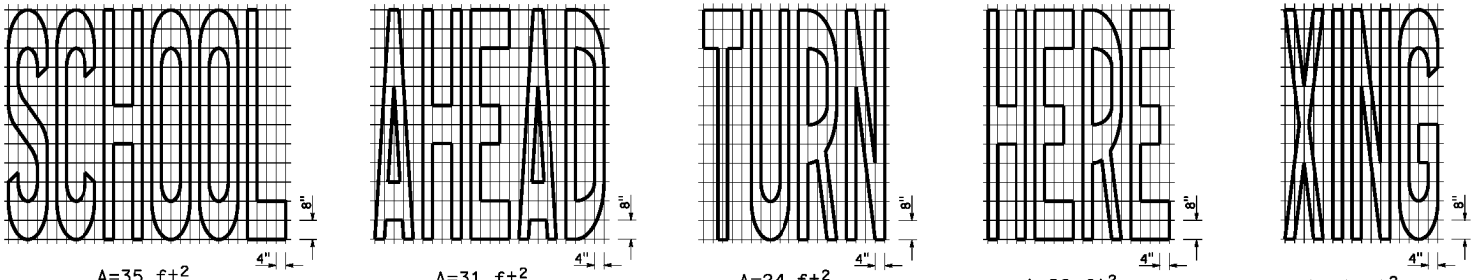
STANDARD DETAIL **459**

SHEET 1 OF 1

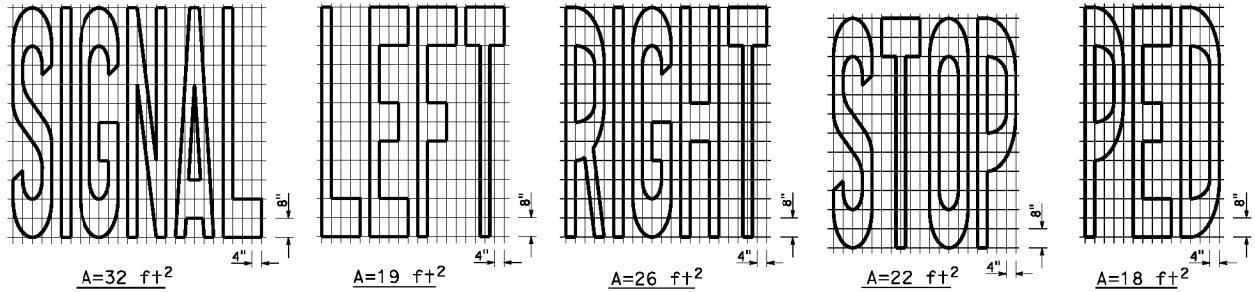
DEPARTMENT OF PUBLIC WORKS



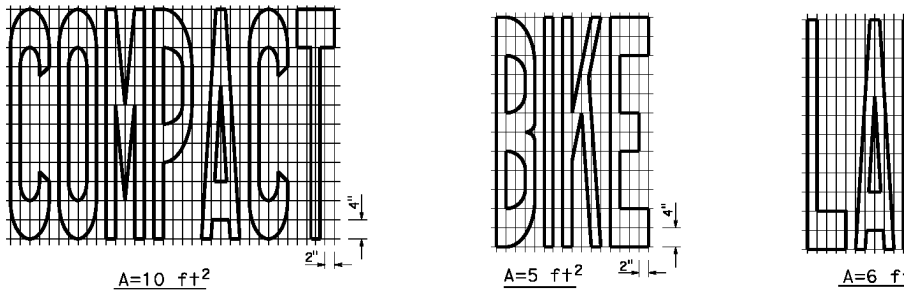
A=43 ft² A=42 ft² A=24 ft² A=23 ft² A=19 ft²



A=35 ft² A=31 ft² A=24 ft² A=26 ft² A=21 ft²



A=32 ft² A=19 ft² A=26 ft² A=22 ft² A=18 ft²



A=10 ft² A=5 ft² A=6 ft²

NOTES:

1. If a message consists of more than one word, it must read "UP", i.e., the first word must be nearest the driver.
2. The space between words must be at least four times the height of the characters for low speed roads, but not more than ten times the height of the characters. The space may be reduced appropriately where there is limited space because of local conditions.
3. Minor variations in dimensions may be accepted by the Engineer.
4. Portions of a letter, number or symbol may be separated by connecting segments not to exceed 2" in width.

WORD MARKINGS							
ITEM	ft²	ITEM	ft²	ITEM	ft²	ITEM	ft²
XING	21	YIELD	24	BIKE	5	PED	18
AHEAD	31	SCHOOL	35	SLOW	23	COMPACT	10
WAIT	19	SIGNAL	32	STOP	22	RUNAWAY	43
LANE	6	TURN	24	LEFT	19	VEHICLES	42
RIGHT	26	HERE	26				

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

Atifa Ferouz
REGISTERED CIVIL ENGINEER

May 31, 2018
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
Atifa Ferouz
No. C80402
Exp. 3-31-19
CIVIL
STATE OF CALIFORNIA

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STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

PAVEMENT MARKINGS WORDS

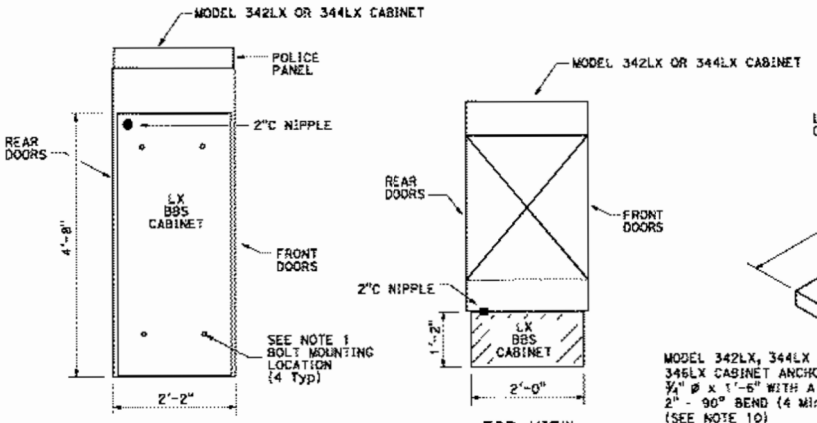
NO SCALE

A24D

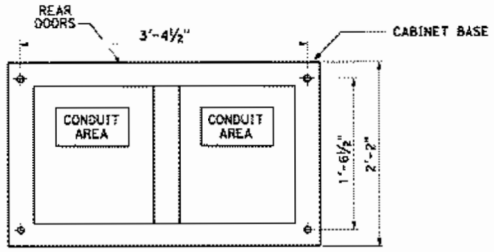
1-26-18

2018 STANDARD PLAN A24D

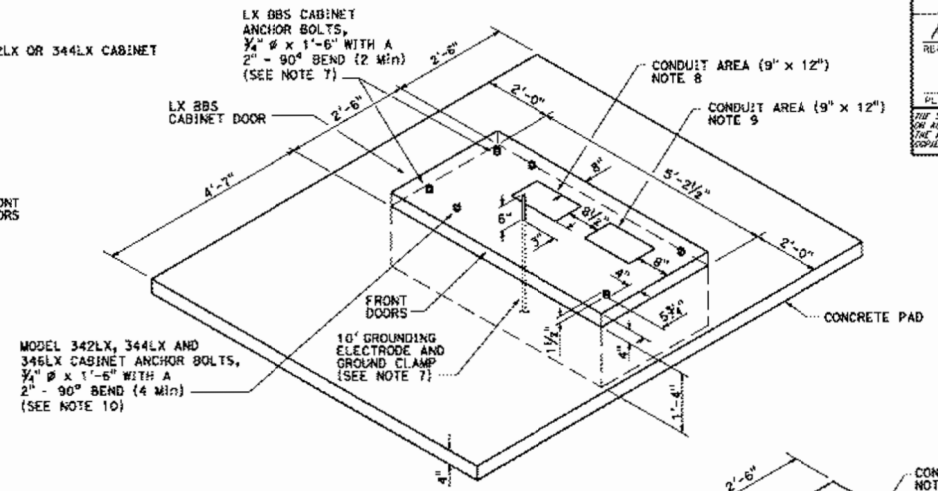
Return to Table of Contents



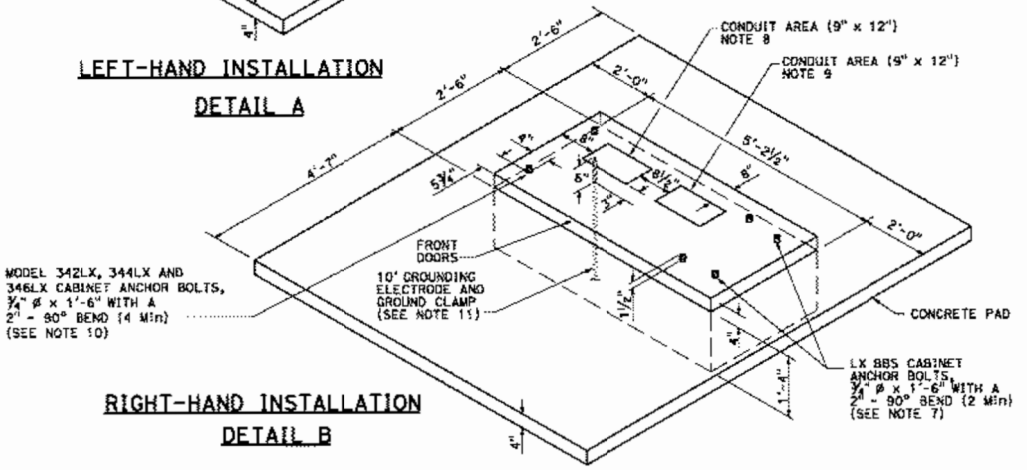
LX BBS CABINET MOUNTED TO THE MODEL 342LX OR 344LX CABINET



BASE PLAN FOR MODEL 342LX OR 344LX CABINET



LEFT-HAND INSTALLATION DETAIL A



RIGHT-HAND INSTALLATION DETAIL B

MODIFIED MODEL 342LX OR 344LX CABINET FOUNDATION DETAIL FOR BATTERY BACKUP SYSTEM

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

H.R.J.
REGISTERED ELECTRICAL ENGINEER
May 31, 2018
PLANS APPROVAL DATE
Nasid Zolfaghari No. E15638 12-31-19 ELECTRICAL STATE OF CALIFORNIA
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

NOTES:

1. Controller units, plug-mounted equipment, shelf-mounted equipment and wall-mounted equipment shall be located to permit safe and easy removal or replacement without removing any other piece of equipment.
2. Cabinet fan may be installed at an alternate location near the top of the cabinet when approved by the Engineer.
3. Where telephone interconnect is required, a minimum of 5" clear vertical space shall be provided inside the cabinet for the equipment.
4. Telephone interconnect conductors shall be enclosed in a ¾"C or larger conduit through the foundation. Type 4 conduit shall be used to separate telephone and power conductors in cabinets.
5. The LX BBS cabinet shall be mounted to the model 342LX or 344LX cabinet with four 18-8 stainless steel hex head, fully-threaded, ⅜"-16 x 1" bolts; two washers per bolt, designed for ⅜" bolts and are 18-8 stainless steel, 1" outside diameter, round, and flat; and one K-Lock nut per bolt that is 18-8 stainless steel and a hex-nut.
6. All dimensions are nominal.
7. The dimensions of the BBS cabinet shall be verified prior to constructing the foundation of the Std model 342LX or 344LX cabinet foundation.
8. Conduit area, to 120 V Service.
9. Conduit area for the controller side of cabinet.
10. For Type LX cabinets details, see "Transportation Electrical Equipment Specifications".
11. Grounding electrode shall be placed 3 inches in front of the service conduit area.

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

ELECTRICAL SYSTEMS (CONTROLLER CABINET FOUNDATION DETAILS)

NO SCALE

ES-3C2

Return to Table of Contents

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

REGISTERED ELECTRICAL ENGINEER

October 30, 2015
PLANS APPROVAL DATE

Exp. 6-30-15

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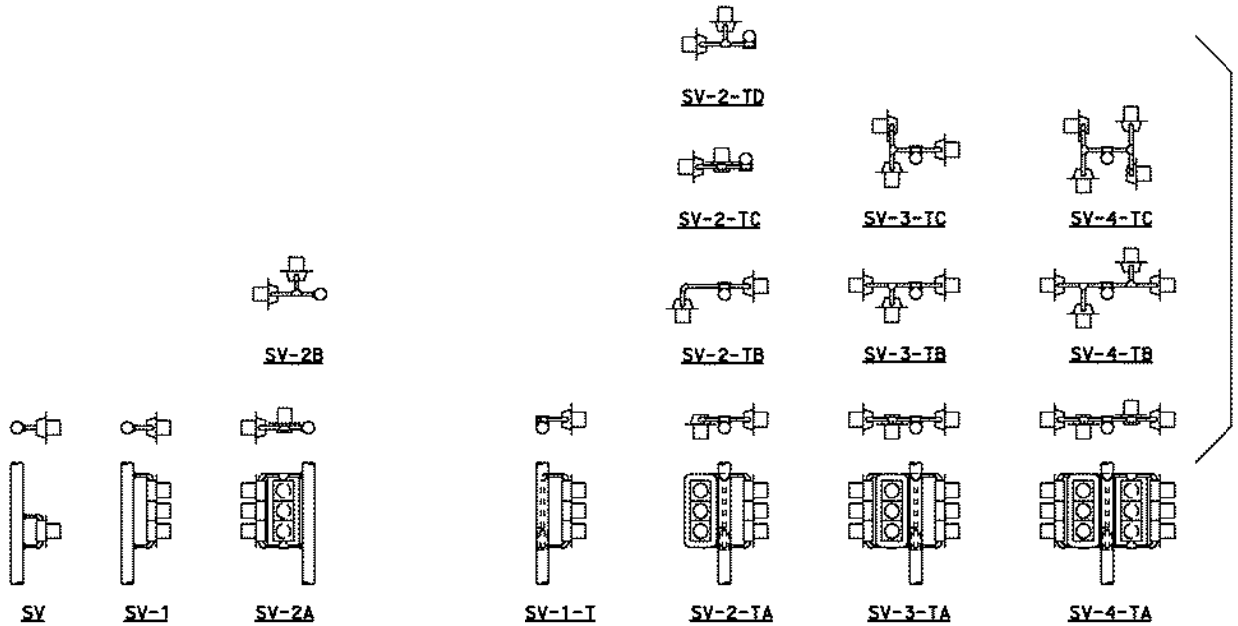
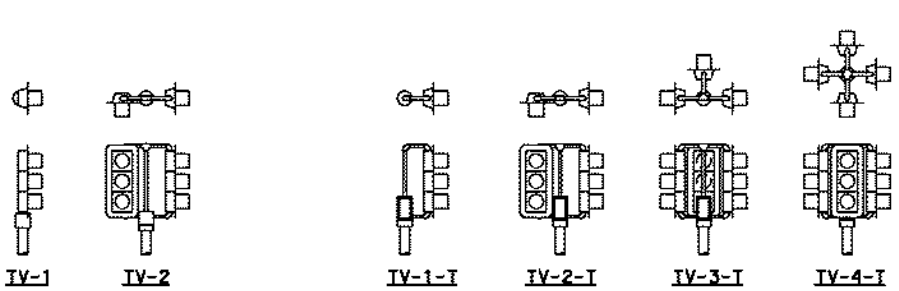


PLAN VIEW OF OTHER SIDE MOUNTINGS

SIDE MOUNTINGS



PLAN VIEW OF TOP MOUNTINGS

TOP MOUNTINGS

ABBREVIATIONS:

SV	SIDE MOUNTED SIGNAL HEADS
T	TERMINAL COMPARTMENT
TV	TOP MOUNTED SIGNAL HEADS
1, 2, 3, 4	NUMBER OF SIGNAL FACES (3 - SECTION, UNLESS OTHERWISE INDICATED)
A, B, C, D	CONFIGURATION OF SIGNALS

NOTES:

1. Mountings shall be oriented to provide maximum horizontal clearance to adjacent roadway.
2. Bracket arms shall be long enough to permit proper alignment of signals and backplate installation.
3. See Standard Plans ES-4D and ES-4E for attachment fitting details.

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

ELECTRICAL SYSTEMS (SIGNAL HEADS AND MOUNTINGS)

NO SCALE

ES-4A

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

H.R.T
REGISTERED ELECTRICAL ENGINEER

May 31, 2018
PLANS APPROVAL DATE

Hamid Zoufagari
No. E15636
Exp. 12-31-19
ELECTRICAL

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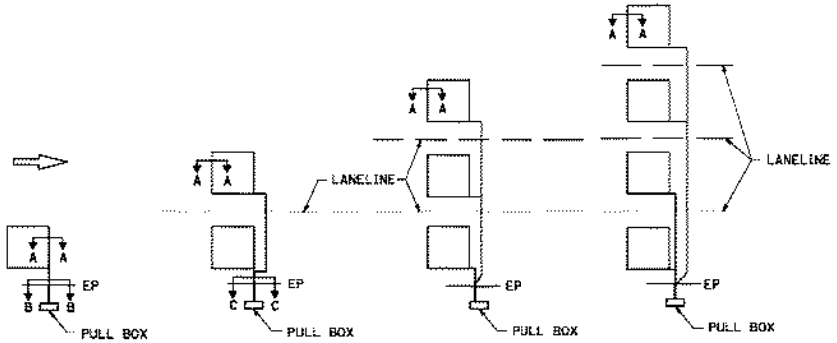
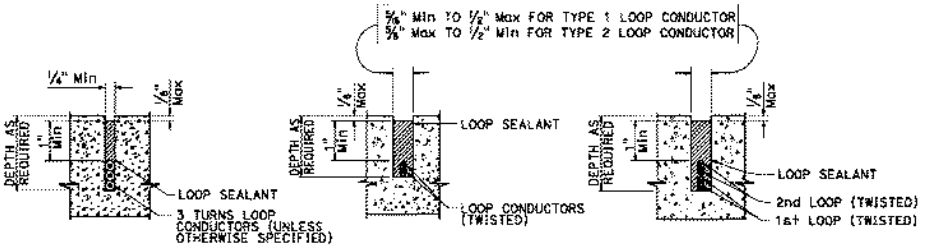


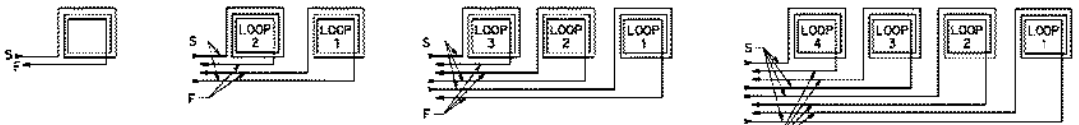
SAW CUT DETAILS

Type A loop detector configurations illustrated



SECTION A-A SECTION B-B SECTION C-C

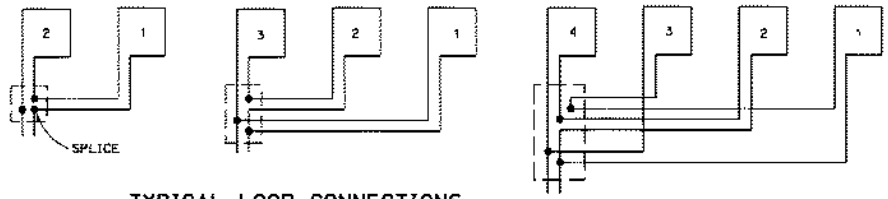
SLOT DETAILS - TYPE 1 AND TYPE 2 LOOP CONDUCTOR



WINDING DETAILS

ABBREVIATIONS:

S - START
F - FINISH



TYPICAL LOOP CONNECTIONS

Dashed lines represent the pull box

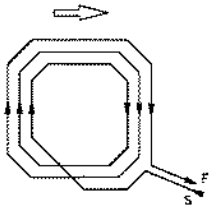
STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

ELECTRICAL SYSTEMS (LOOP DETECTORS)

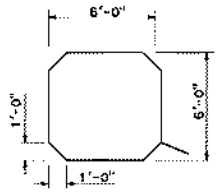
NO SCALE

ES-5A

Return to Table of Contents

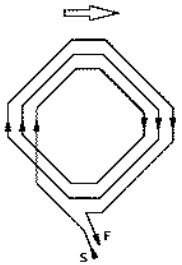


WINDING DETAIL

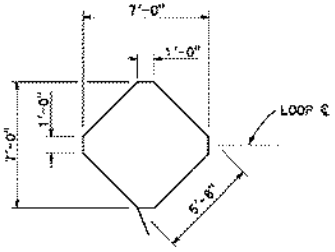


SAW CUT DETAIL

TYPE A LOOP DETECTOR CONFIGURATION

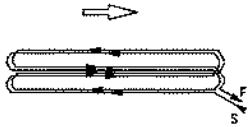


WINDING DETAIL

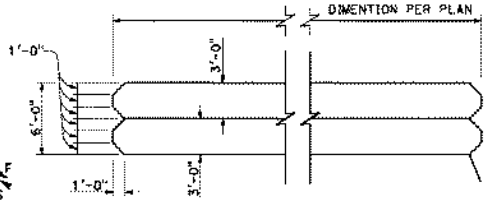


SAW CUT DETAIL

TYPE B LOOP DETECTOR CONFIGURATION

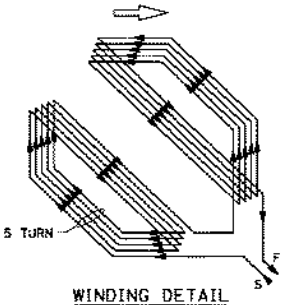


WINDING DETAIL

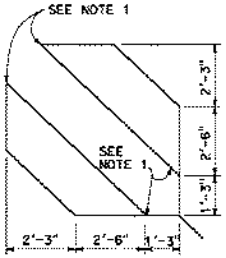


SAW CUT DETAIL

TYPE C LOOP DETECTOR CONFIGURATION

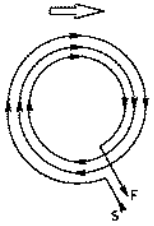


WINDING DETAIL

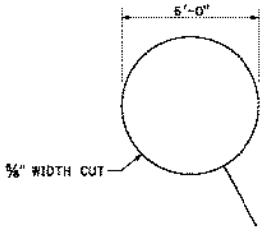


SAW CUT DETAIL

TYPE D LOOP DETECTOR CONFIGURATION

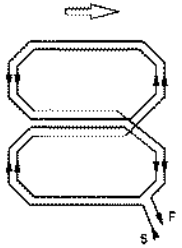


WINDING DETAIL

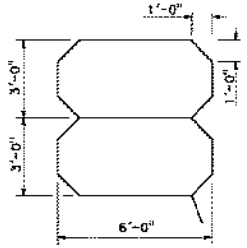


SAW CUT DETAIL

TYPE E LOOP DETECTOR CONFIGURATION



WINDING DETAIL

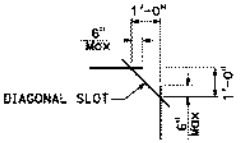


SAW CUT DETAIL

TYPE Q LOOP DETECTOR CONFIGURATION

NOTES:

1. Round corners of acute angle saw cuts to prevent damage to conductors.
2. Typical distance separating loops from edge to edge is 10' for Type A, B, D, and E installation in single lane.
3. Use Type D loops for limit line detection and bicycle lanes.



PLAN VIEW OF DIAGONAL SLOT AT CORNERS

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

H.R.Z
REGISTERED ELECTRICAL ENGINEER

May 31, 2018
PLANS APPROVAL DATE

THE STATE OF CALIFORNIA AND ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

REGISTERED PROFESSIONAL ENGINEER
Hamid Zarfegari
No. E15638
Exp 12-31-19
ELECTRICAL
STATE OF CALIFORNIA

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

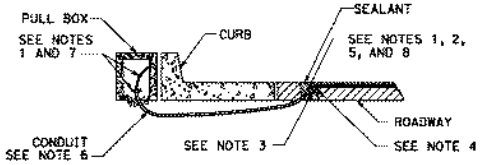
ELECTRICAL SYSTEMS (DETECTORS)

NO SCALE

ES-5B

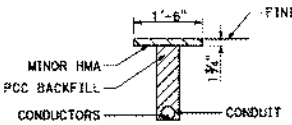
2018 STANDARD PLAN ES-5B

Return to Table of Contents

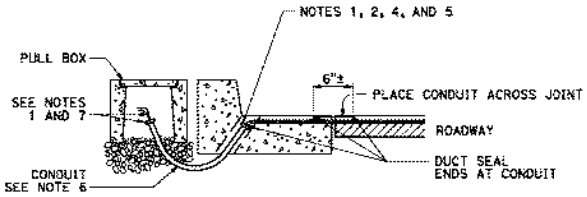


TYPE A

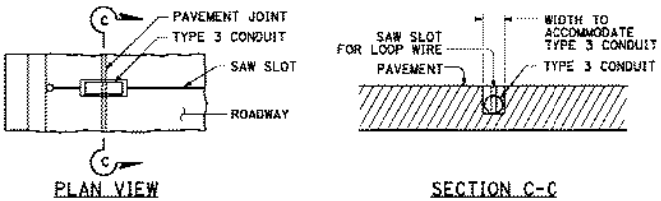
CURB TERMINATION DETAIL



"T" TRENCH DETAIL T



CROSS SECTION

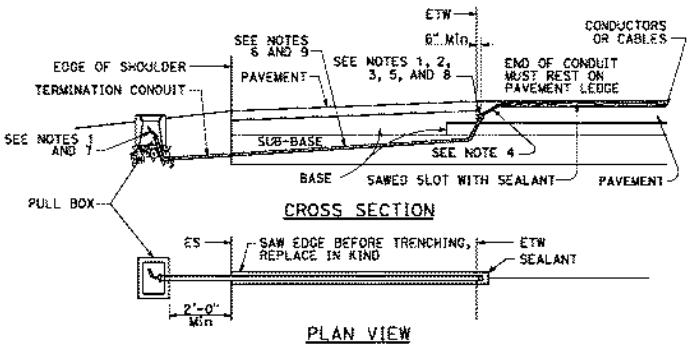


PLAN VIEW

SECTION C-C

TYPE B

CURB TERMINATION DETAIL

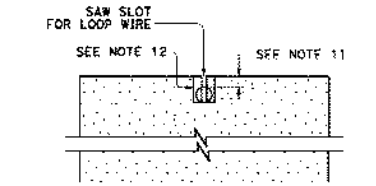


CROSS SECTION

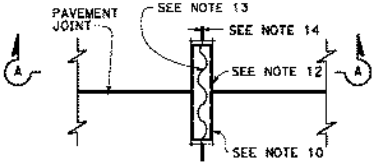
PLAN VIEW

SHOULDER TERMINATION DETAILS

DETECTOR HANDHOLE DETAIL

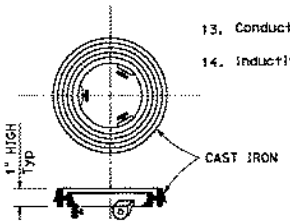


SECTION A-A



PLAN VIEW

TYPICAL LOOP LEAD-IN DETAIL AT PAVEMENT JOINT



LOCKING GRADE RING

NOTES:

1. Bushing shall be used at end of conduit.
2. Tape detector conductors or cables 3" each side of bushings.
3. Install duct seal compound to each end of termination conduit before installing sealant.
4. Round all sharp edges where detector conductors or cables have to pass.
5. End of conduit shall be 3⅛" below roadway surface.
6.

Conduit size	Loop conductors
1"C minimum	1 to 2 pairs
1½"C minimum	3 to 4 pairs
2"C minimum	5 or more pairs

7. Splice detector conductors or cables to detector lead-in-cable.
8. Location of detector handhole when shown on plans.
9. When the shoulder and traveled way are paved with the same material and there is no joint between them, the conduit shall extend only 2'-0" into the shoulder pavement.
10. ¾"C, Type 3 conduit 6" long minimum, plug both ends with duct compound to keep out sealant.
11. ½" Minimum between top of conduit and pavement surface.
12. Sawcut shall not exceed 1" in width and ⅛" longer than conduit to be installed.
13. Conductors with ½" minimum slack inside conduit.
14. Inductive loop detector saw slot.

DIST	COUNTY	ROUTE	POST MILES	SHEET NO.	TOTAL SHEETS
			TOTAL PROJECT		

H.R.Z
REGISTERED ELECTRICAL ENGINEER
May 31, 2018
PLANS APPROVAL DATE
Hamid Zaifeghari No. E15636 Exp. 12-31-19 ELECTRICAL
REGISTERED PROFESSIONAL ENGINEER STATE OF CALIFORNIA
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STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

ELECTRICAL SYSTEMS (CURB AND SHOULDER TERMINATION, TRENCH, AND HANDHOLE DETAILS)

NO SCALE

ES-5D

2018 STANDARD PLAN ES-5D

507

Return to Table of Contents

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

REGISTERED CIVIL ENGINEER

May 31, 2018
PLANS APPROVAL DATE

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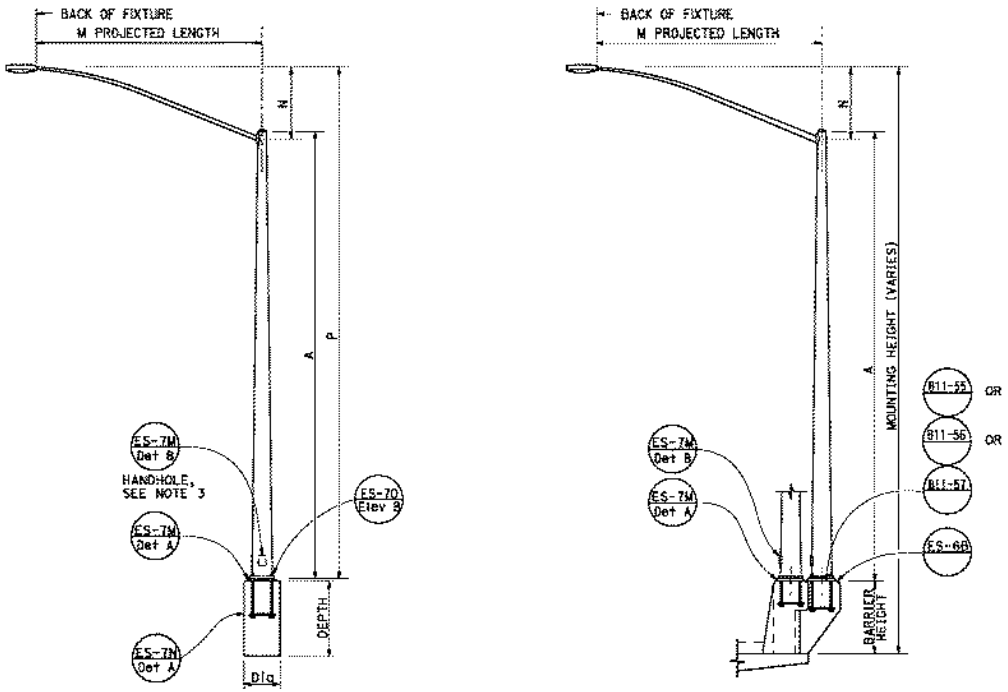
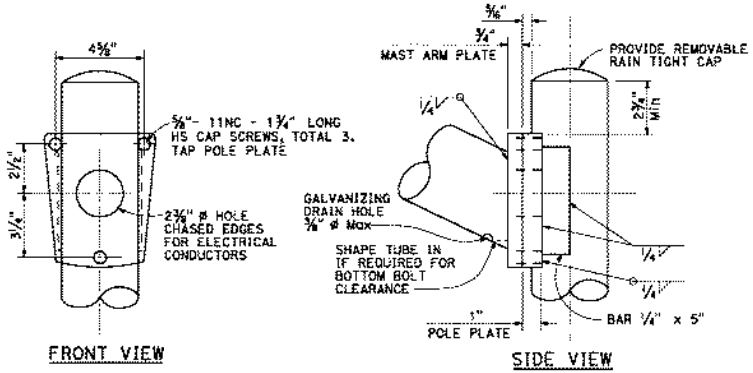
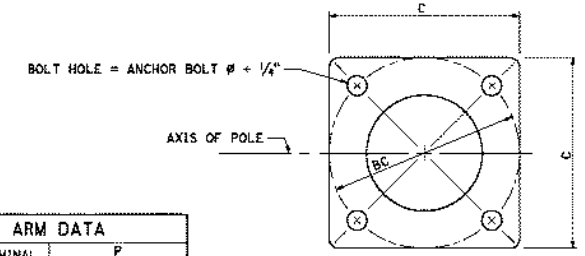


TYPE 15 AND TYPE 21
ELEVATION A

TYPE 15 AND TYPE 21 BARRIER RAIL MOUNTED
ELEVATION B



LUMINAIRE MAST ARM CONNECTION
DETAIL R



BASE PLATE
DETAIL A

POLE TYPE	POLE DATA				BASE PLATE DATA				CIDH PILE FOUNDATION	
	A HEIGHT	Min OD BASE	Min OD TOP	WALL THICKNESS	C	BC = BOLT CIRCLE	THICKNESS	ANCHOR BOLT SIZE	Dia	DEPTH
15	30'-0"	8"	3⅛"	0.1196"	1'-0"	1'-0"	1½"	1" ø x 36" *	2'-6"	6'-0"
21	35'-0"	8⅝"	3⅝"	0.1793"			2"	1¼" ø x 36" *		7'-0"

* FOR BARRIER RAIL BOLTS, SEE STANDARD PLAN ES-66.

LUMINAIRE MAST ARM DATA					
M PROJECTED LENGTH	N RISE	Min OD AT POLE	NOMINAL THICKNESS	P TYPE 15	P TYPE 21
6'-0"	2'-0"±	3¼"	0.1196"	31'-6"±	36'-6"±
8'-0"	2'-6"±	3½"		32'-0"±	37'-0"±
10'-0"	3'-3"±	3⅝"		32'-9"±	37'-9"±
12'-0"	4'-3"±			33'-9"±	38'-9"±
15'-0"	4'-9"±	4¼"		34'-3"±	39'-3"±

NOTES:

1. [ ] indicates mast arm length to be used unless otherwise noted on the plans.
2. For Type 15-SB, use Type 15 standard with Type 30 slip base plate details, see Standard Plan ES-6F.
3. Handhole shall be located on the downstream side of traffic.
4. For additional notes and details, see Standard Plans ES-7M and ES-7N.

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

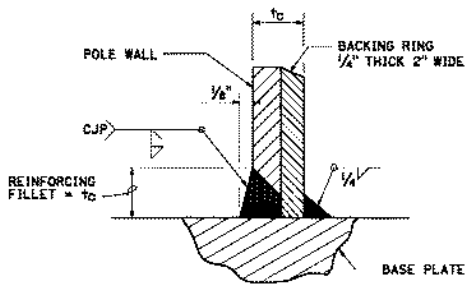
ELECTRICAL SYSTEMS (LIGHTING STANDARD, TYPES 15 AND 21)

NO SCALE

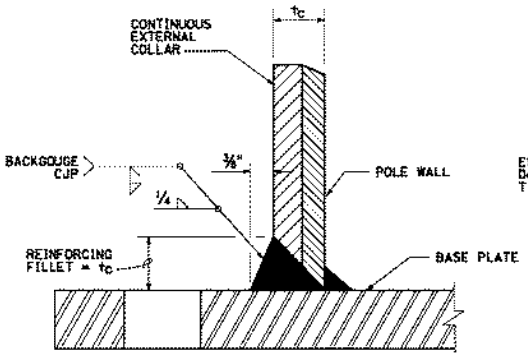
ES-6A

7-30-18

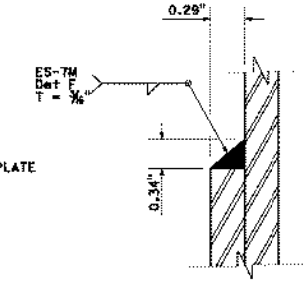
Return to Table of Contents



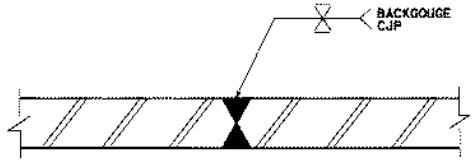
DETAIL B



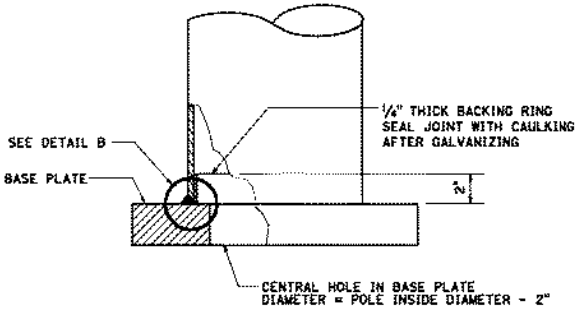
DETAIL C1



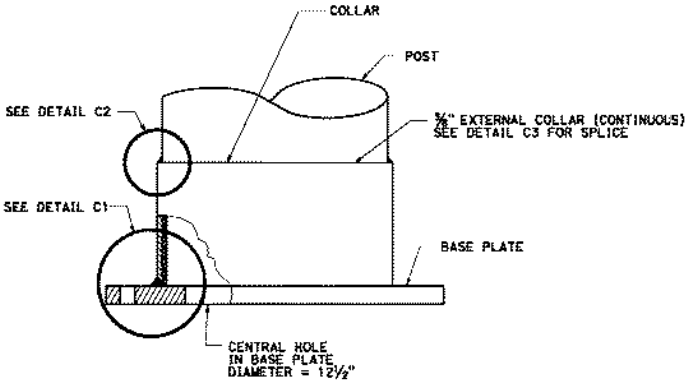
DETAIL C2



DETAIL C3

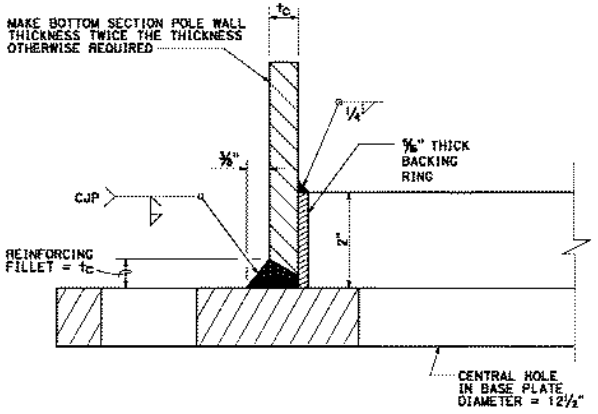


ELEVATION B



ELEVATION C

For alternative base, see Detail C4



DETAIL C4

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

ELECTRICAL SYSTEMS (SIGNAL AND LIGHTING STANDARD, DETAIL No. 3)

NO SCALE

ES-70

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

REGISTERED CIVIL ENGINEER

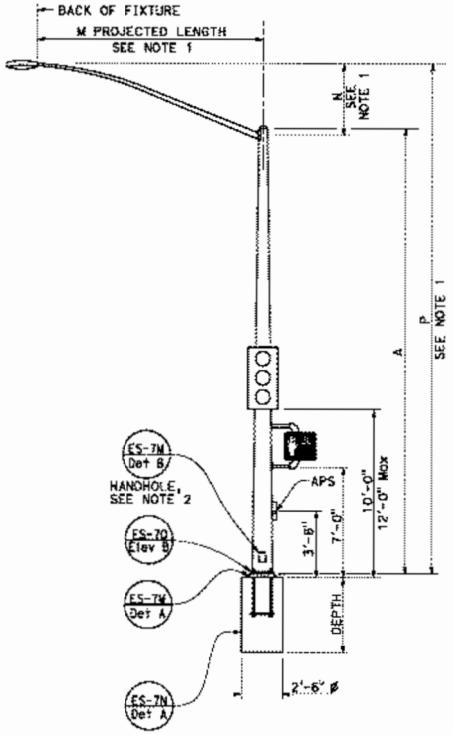
May 31, 2018

PLANS APPROVAL DATE

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

NOTES:

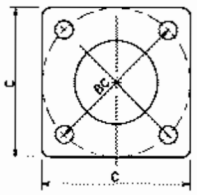
1. For additional notes, details and data for Type 15TS and Type 21TS Standards, see Standard Plan ES-6A.
2. Handhole shall be located on the downstream side of traffic.



TYPE 15TS AND 21TS STANDARD

ELEVATION A

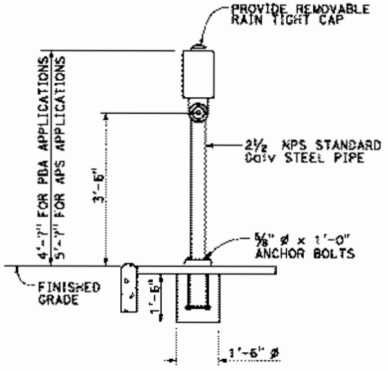
(See Note 1)



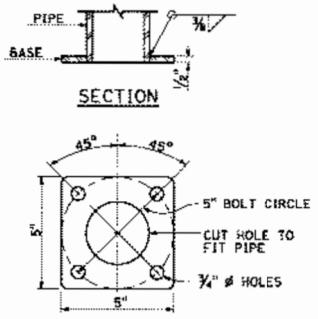
BASE PLATE

TYPE 15TS AND 21TS

DETAIL A



ELEVATION

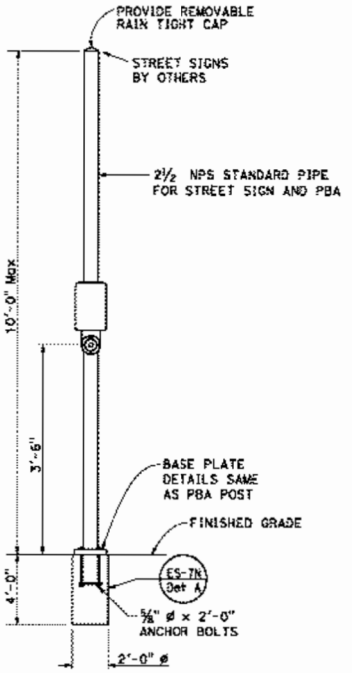


BASE PLATE

PBA POST

PUSH BUTTON ASSEMBLY POST

DETAIL B



COMBINED STREET SIGN

PUSH BUTTON ASSEMBLY POST

DETAIL C

POLE TYPE	POLE DATA				BASE PLATE DATA				CIDH
	A HEIGHT	Min OD BASE	Min OD TOP	WALL THICKNESS	C	BC = BOLT CIRCLE	THICKNESS	ANCHOR BOLT SIZE	DEPTH
15TS	30'-0"	8"	3⅝"	0.1793"	1'-1½"	1'-0"	2"	1½" ø x 42"	7'-6"
21TS	35'-0"	9⅜"	3⅝"		1'-3"	1'-2"			8'-6"

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

ELECTRICAL SYSTEMS (SIGNAL AND LIGHTING STANDARD, TYPE TS, AND PUSH BUTTON ASSEMBLY POST)

NO SCALE

ES-7A

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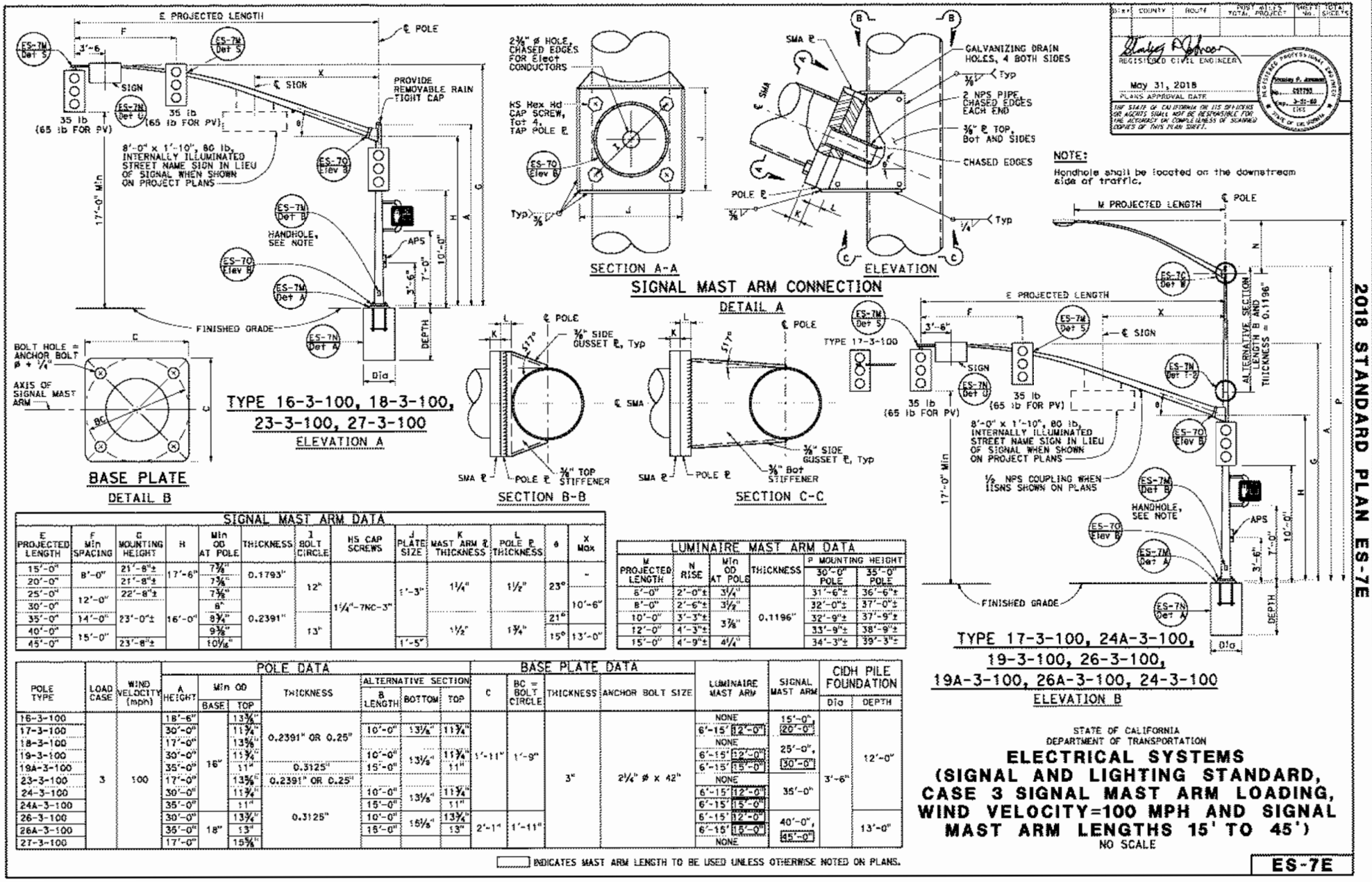

SIGNAL MAST ARM DATA

E PROJECTED LENGTH	F Min SPACING	G MOUNTING HEIGHT	H	Min OD AT POLE	THICKNESS	J BOLT CIRCLE	HS CAP SCREWS	d PLATE SIZE	K MAST ARM ℄ THICKNESS	L POLE ℄ THICKNESS	θ	X Max
15'-0"	8'-0"	21'-8"±	17'-6"	7⅞"	0.1793"	12"	1¼"-7NC-3"	1'-3"	1¼"	1½"	23°	10'-6"
20'-0"		21'-8"±		7⅞"								
25'-0"	12'-0"	22'-8"±		7¾"								
30'-0"				8"								
35'-0"	14'-0"	23'-0"±	16'-0"	8¼"	0.2391"	13"		1'-5"	1½"	1¾"	21°	13'-0"
40'-0"	15'-0"			9⅜"							15°	
45'-0"		23'-8"±		10⅛"								

LUMINAIRE MAST ARM DATA

M PROJECTED LENGTH	N RISE	Min OD AT POLE	THICKNESS	P MOUNTING HEIGHT 30'-0" POLE	P MOUNTING HEIGHT 35'-0" POLE
6'-0"	2'-0"±	3¼"	0.1196"	31'-6"±	36'-6"±
8'-0"	2'-6"±	3½"		32'-0"±	37'-0"±
10'-0"	3'-3"±	3⅝"		32'-9"±	37'-9"±
12'-0"	4'-3"±			33'-9"±	38'-9"±
15'-0"	4'-9"±	4¼"		34'-3"±	39'-3"±

POLE TYPE	LOAD CASE	WIND VELOCITY (mph)	POLE DATA A HEIGHT	Min OD BASE	Min OD TOP	THICKNESS	ALTERNATIVE SECTION B LENGTH	ALTERNATIVE SECTION BOTTOM	ALTERNATIVE SECTION TOP	BASE PLATE DATA C	BC = BOLT CIRCLE	THICKNESS	ANCHOR BOLT SIZE	LUMINAIRE MAST ARM	SIGNAL MAST ARM	CIDH PILE FOUNDATION Dia	CIDH PILE FOUNDATION DEPTH
16-3-100	3	100	18'-6"	16"	13⅜"	0.2391" OR 0.25"	10'-0"	13⅛"	11¾"	1'-11"	1'-9"	3"	2¼" ø x 42"	NONE	15'-0"	3'-6"	12'-0"
17-3-100			30'-0"		11¾"									6'-15" 12'-0"	20'-0"		
18-3-100			17'-0"		13⅝"									NONE	25'-0", 30'-0"		
19-3-100			30'-0"		11¾"		10'-0"	13⅛"	11¾"					6'-15" 12'-0"			
19A-3-100			35'-0"		11"	0.3125"	15'-0"		11"					6'-15" 15'-0"			
23-3-100			17'-0"		13⅝"	0.2391" OR 0.25"								NONE	35'-0"		
24-3-100			30'-0"		11¾"		10'-0"	13⅛"	11¾"					6'-15" 12'-0"			
24A-3-100			35'-0"		11"		15'-0"		11"					6'-15" 15'-0"			
26-3-100			30'-0"	18"	13¾"	0.3125"	10'-0"	15⅛"	13¾"	2'-1"	1'-11"			6'-15" 12'-0"	40'-0", 45'-0"		13'-0"
26A-3-100			35'-0"		13"		15'-0"		13"					6'-15" 15'-0"			
27-3-100			17'-0"		15⅝"									NONE			

INDICATES MAST ARM LENGTH TO BE USED UNLESS OTHERWISE NOTED ON PLANS.

DIST | COUNTY | ROUTE | POST MILES TOTAL PROJECT | SHEET NO. | TOTAL SHEETS

REGISTERED CIVIL ENGINEER

May 31, 2018
PLANS APPROVAL DATE

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STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

ELECTRICAL SYSTEMS (SIGNAL AND LIGHTING STANDARD, CASE 3 SIGNAL MAST ARM LOADING, WIND VELOCITY=100 MPH AND SIGNAL MAST ARM LENGTHS 15' TO 45')

NO SCALE

ES-7E

2018 STANDARD PLAN ES-7E

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DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

H.R.F.
REGISTERED ELECTRICAL ENGINEER

July 21, 2017
PLANS APPROVAL DATE

Hamid Zaifaghari
No. E15638
Exp. 12-31-17
ELECTRICAL

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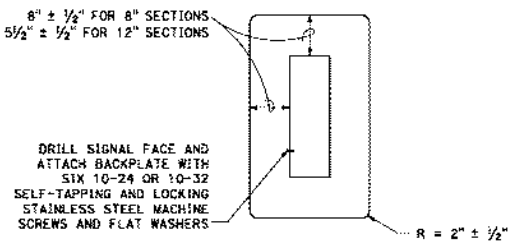
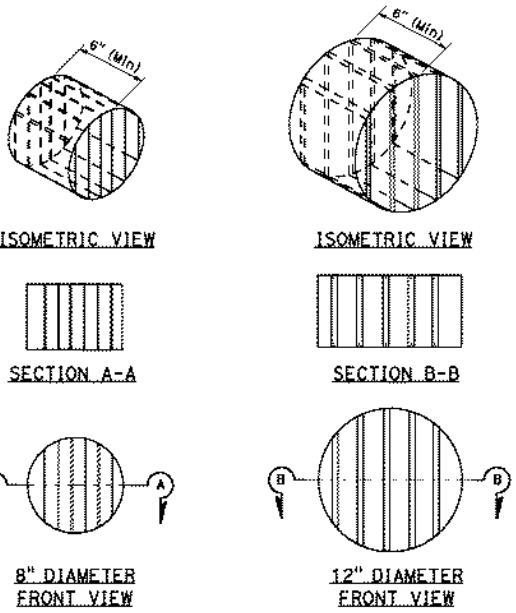
TO ACCOMPANY PLANS DATED _____

VISORS



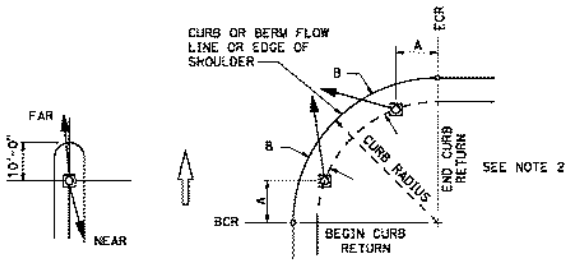
8" AND 12" SECTIONS

BACKPLATE



DIRECTIONAL LOUVER

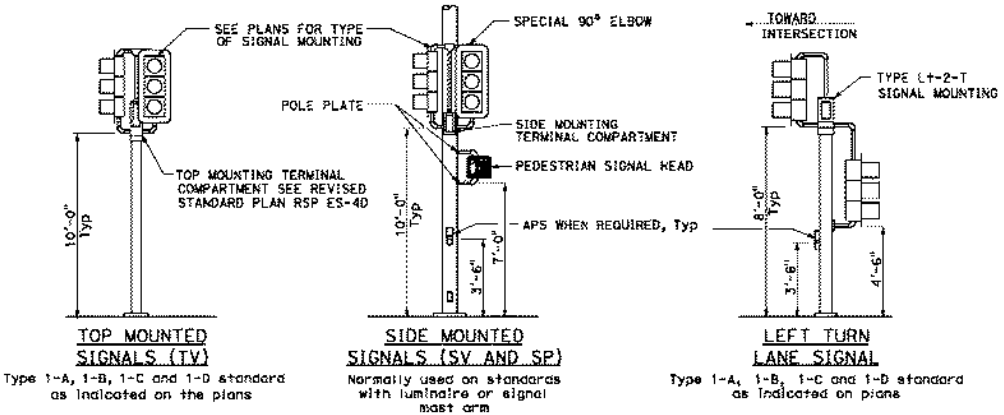
Directional louvers shall be oriented and secured in place with one plated brass machine screw and nut.



NOTES:

1. Typical signal pole placement unless dimensioned on plans.
2. For A and B dimensions, see Pole Schedule.

SIGNAL STANDARD PLACEMENT DIMENSIONS AND EQUIPMENT LOCATIONS

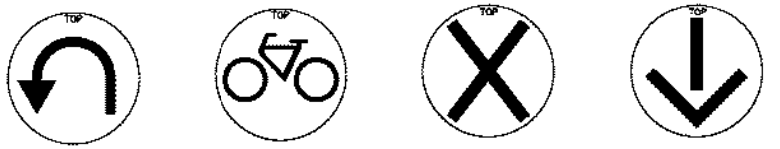


TOP MOUNTED SIGNALS (TV)
Type 1-A, 1-B, 1-C and 1-D standard as indicated on the plans

SIDE MOUNTED SIGNALS (SV AND SP)
Normally used on standards with luminaire or signal mast arm

LEFT TURN LANE SIGNAL
Type 1-A, 1-B, 1-C and 1-D standard as indicated on plans

TYPICAL SIGNAL HEAD INSTALLATIONS



SIGNAL FACES

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

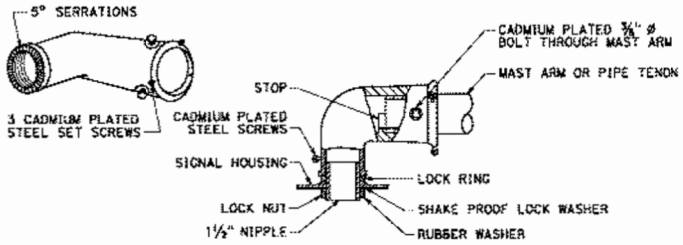
ELECTRICAL SYSTEMS (SIGNAL HEADS AND MOUNTINGS)

NO SCALE

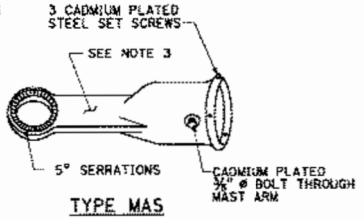
RSP ES-4C DATED JULY 21, 2017 SUPERSEDES STANDARD PLAN ES-4C DATED OCTOBER 30, 2015 - PAGE 442 OF THE STANDARD PLANS BOOK DATED 2015.

REVISED STANDARD PLAN RSP ES-4C

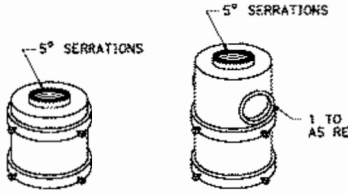
4-1-17



TYPE MAT
MAST ARM MOUNTING
For 2 NPS pipe, see Note 1.



TYPE MAS
MAST ARM MOUNTING
For 2 NPS pipe, see Note 1.

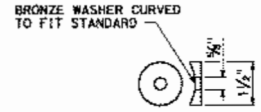


TOP MOUNTINGS
For 4 NPS pipe, see Note 2.

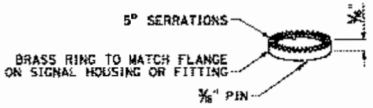
SIGNAL SLIP FITTERS

NOTES:

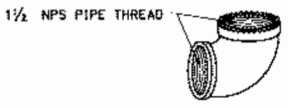
1. After mast arm signal has been plumbed and secured, drill ⅜" hole through mast arm tenon in line with slip fitter hole. Place a cadmium plated ⅜" ø galvanized bolt with washer under bolt head through hole and secure with washer, nut, and locknut. Seal openings between mast arm mountings and mast arm with mastic.
2. Threaded top mounted slip fitter openings shall be 1½ NPS. Serrations in fittings shall match those on bottom of signal heads or in lock ring. Top opening shall be offset when backplate is used.
3. Wireway shall have a cross section area of 0.95 square inch minimum. Minimum width of ½".



DETAIL C

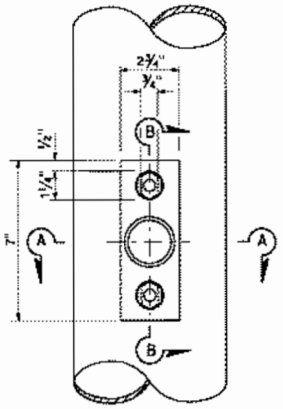


LOCK RING
Use where locking ring is not integral with signal housing or fitting.

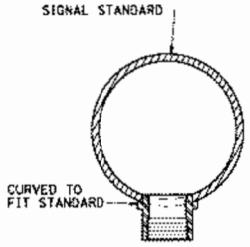


SPECIAL 90° ELBOW
One for each signal head, except those with special slip fitter mounting

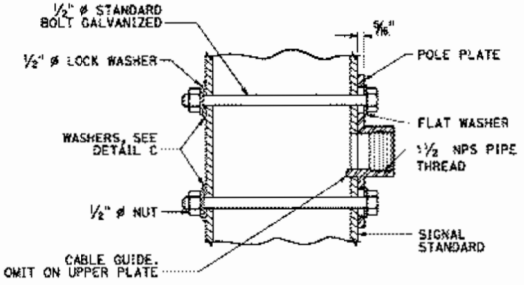
MISCELLANEOUS MOUNTING HARDWARE



TOP VIEW

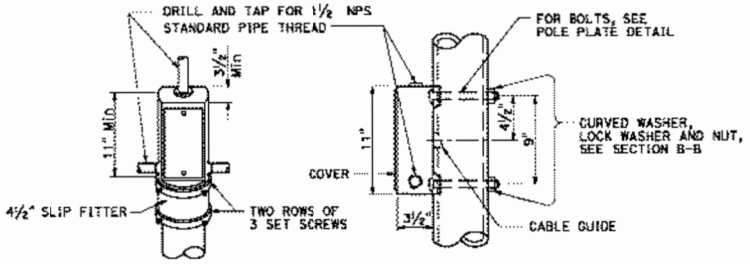


SECTION A-A



SECTION B-B

POLE PLATE FOR SIDE MOUNTED SIGNAL HEAD
WITHOUT TERMINAL COMPARTMENT



TOP MOUNTING SIDE MOUNTING

TERMINAL COMPARTMENT

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

H.R.J.
REGISTERED ELECTRICAL ENGINEER
July 21, 2017
PLANS APPROVAL DATE
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

REGISTERED PROFESSIONAL ENGINEER — Hamid Zolfaghari — No. E15838 — 12-31-17 — ELECTRICAL — STATE OF CALIFORNIA

TO ACCOMPANY PLANS DATED _____

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

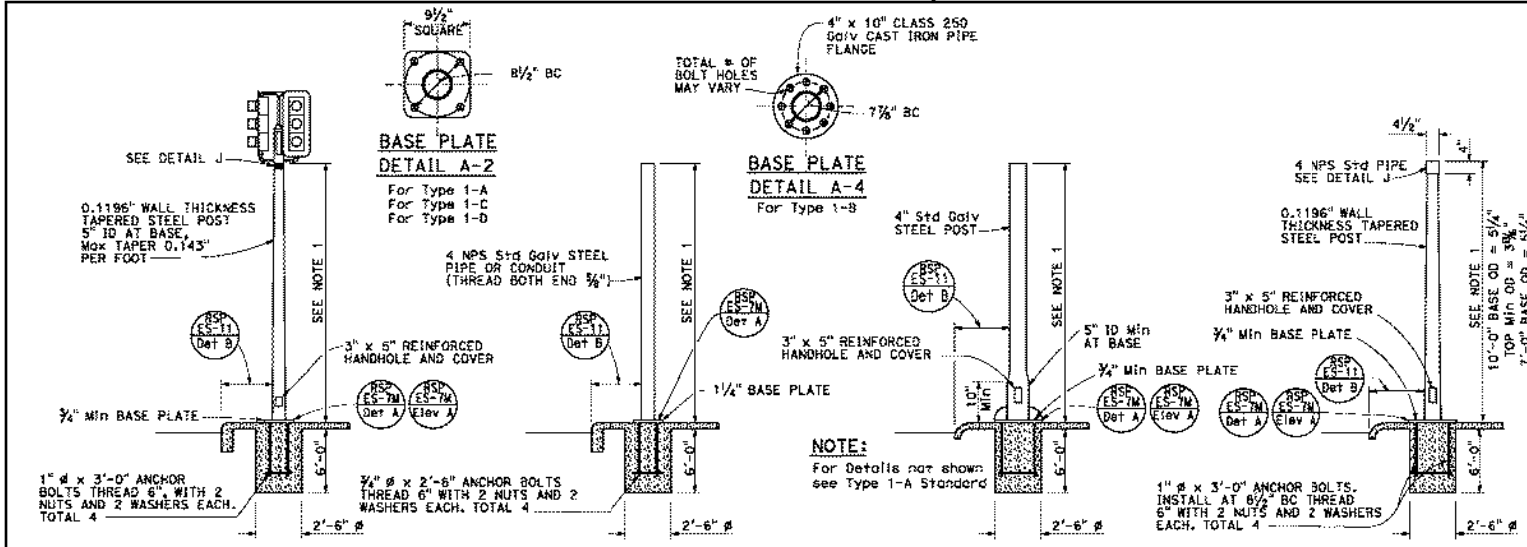
ELECTRICAL SYSTEMS (SIGNAL HEAD MOUNTING)

NO SCALE

RSP ES-4D DATED JULY 21, 2017 SUPERSEDES STANDARD PLAN ES-4D DATED OCTOBER 30, 2015 - PAGE 443 OF THE STANDARD PLANS BOOK DATED 2015.

REVISED STANDARD PLAN RSP ES-4D

2015 REVISED STANDARD PLAN RSP ES-4D



TYPE 1 SIGNAL STANDARDS
DETAIL A

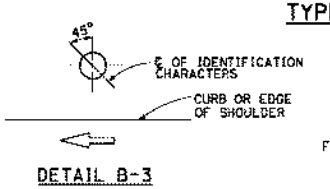
Dist	County	Route	Post Miles (Total Project)	Sheet	Total Sheets

REGISTERED CIVIL ENGINEER
July 15, 2016
PLANS APPROVAL DATE
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.
REGISTERED PROFESSIONAL ENGINEER — Stacey P. Johnson — No. 68793 — Exp. 3-31-18 — CIVIL — STATE OF CALIFORNIA

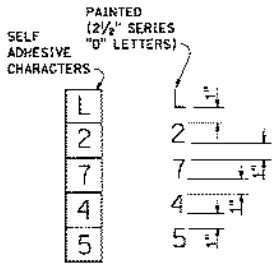
TO ACCOMPANY PLANS DATED .....

NOTES:

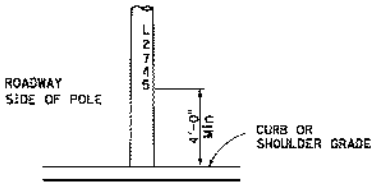
1. Standards shall be 10'-0" ± 2" for vehicle signals and 7'-0" ± 2" for pedestrian signals unless shorter pole is noted on project plans.
2. Top of standards shall be 4½" OD.
3. Conduits shall extend 2" maximum above finished surface of foundation and for Types 1-A, 1-C and 1-D shall be sloped toward handhole.
4. Anchor bolts shall be bonded to conduit or grounding conductor.
5. For additional notes and details, see Revised Standard Plans RSP ES-7M and RSP ES-7N.
6. Pour foundation concrete against undisturbed soil.
7. For standards with handhole, locate in the downstream side of traffic.
8. Coupling nuts to be used only when shown or specified on project plans.



DETAIL B-3

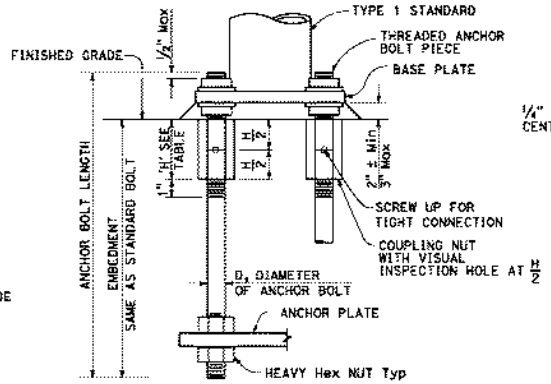


IDENTIFICATION CHARACTER DETAIL
DETAIL B-1

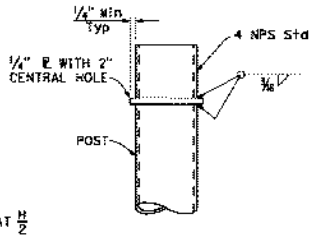


TYPICAL IDENTIFICATION CHARACTER FORMAT
DETAIL B-2

LOCATION OF EQUIPMENT IDENTIFICATION CHARACTERS ON STANDARDS AND POSTS
DETAIL B



ANCHOR BOLTS WITH SLEEVE NUTS
DETAIL C
(See Note 8)



DETAIL J

COUPLING NUT TABLE	
BOLT DIAMETER	NUT TABLE THICKNESS 'R'
¾"	2¼"
1"	3"

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

ELECTRICAL SYSTEMS (SIGNAL AND LIGHTING STANDARD, TYPE 1 AND EQUIPMENT IDENTIFICATION CHARACTERS)

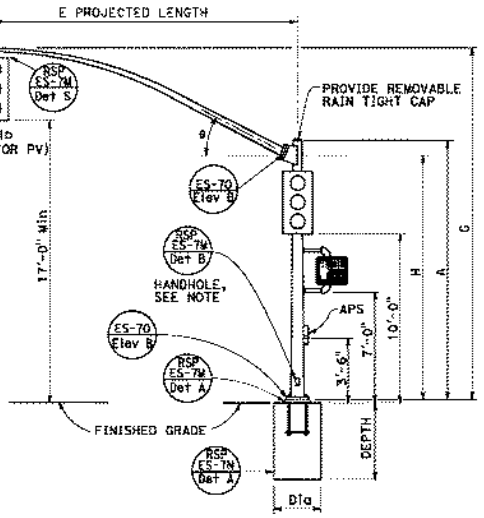
NO SCALE

RSP ES-7B DATED JULY 15, 2016 SUPERSEDES STANDARD PLAN ES-7B DATED OCTOBER 30, 2015 - PAGE 457 OF THE STANDARD PLANS BOOK DATED 2015.

REVISED STANDARD PLAN RSP ES-7B

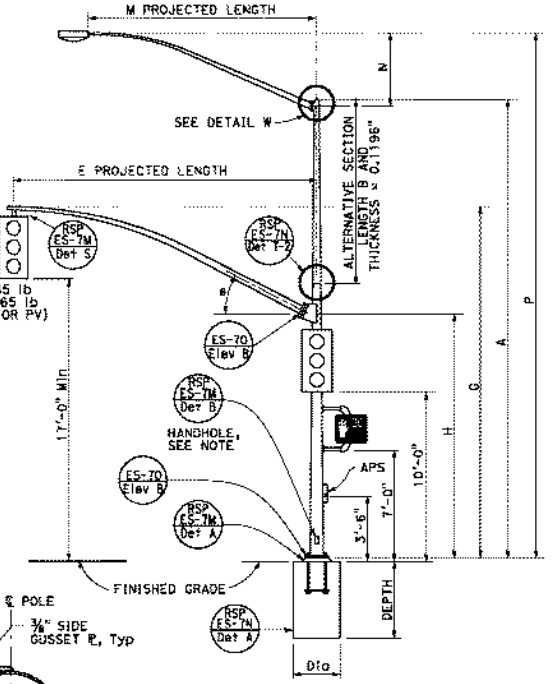
2015 REVISED STANDARD PLAN RSP ES-7B

6/30/14



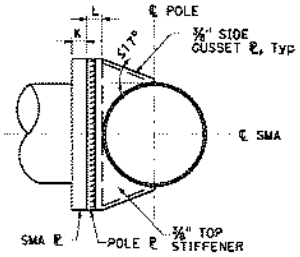
TYPE 16-1-100, 18-1-100

ELEVATION A

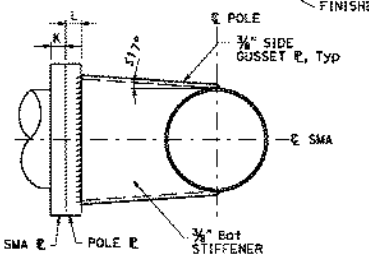


TYPE 19-1-100, 19A-1-100

ELEVATION B



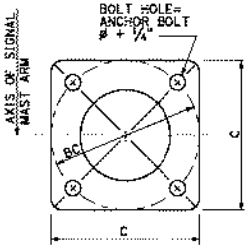
SECTION B-B



SECTION C-C

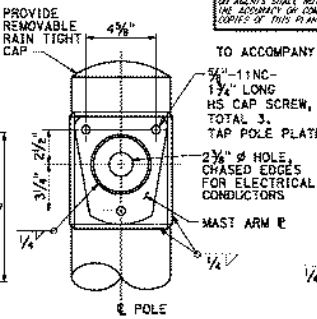
NOTES:

1. Handhole shall be located on the downstream side of traffic.
2. Δ = Luminaire mast arm skew -90° or +90° default 0°



DETAIL D

BASE PLATE

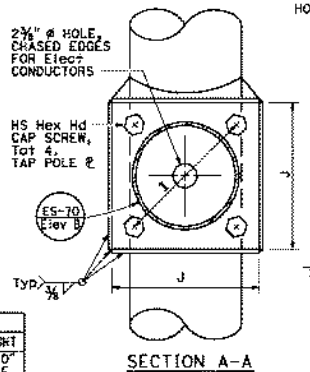


DETAIL W-1

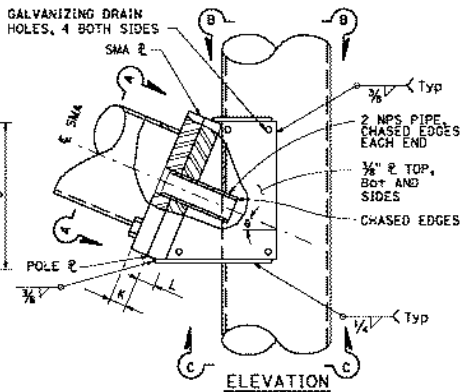
LUMINAIRE MAST ARM CONNECTION

DETAIL W-2

DETAIL W



SECTION A-A



ELEVATION

SIGNAL MAST ARM CONNECTION

DETAIL A

SIGNAL MAST ARM DATA										
E PROJECTED LENGTH	G MOUNTING HEIGHT	H	Min OD AT POLE	THICKNESS	L BOLT CIRCLE	HS CAP SCREWS	J PLATE SIZE	K MAST ARM PL THICKNESS	L POLE PL THICKNESS	θ
15'-0"	21'-8"±	17'-6"	7 7/8"	0.1793"	12"	1 1/4"-7NC-3"	1'-0"	1 1/4"	1 1/2"	23°
20'-0"			8"							
25'-0"	22'-8"±	18'-0"	9"				1'-1"			
30'-0"	23'-0"±		10"							

LUMINAIRE MAST ARM DATA						
M PROJECTED LENGTH	N RISE	Min OD AT POLE	THICKNESS	P MOUNTING HEIGHT	
				30'-0" POLE	35'-0" POLE
6'-0"	2'-0"±	3 1/4"	0.1196"	31'-6"±	36'-6"±
8'-0"	2'-6"±	3 1/2"		32'-0"±	37'-0"±
10'-0"	3'-3"±	3 5/8"		32'-8"±	37'-9"±
12'-0"	4'-3"±			33'-9"±	38'-9"±
15'-0"	4'-9"±	4 1/4"		34'-3"±	39'-3"±

POLE TYPE	LOAD CASE	WIND VELOCITY (mph)	POLE DATA						BASE PLATE DATA				LUMINAIRE MAST ARM	SIGNAL MAST ARM	CIDH PILE FOUNDATION	
			A HEIGHT	Min OD		THICKNESS	ALTERNATIVE SECTION			C	BC = BOLT CIRCLE	THICKNESS	ANCHOR BOLT SIZE			Dia	DEPTH
				BASE	TOP		B LENGTH	BOTTOM	TOP								
16-1-100	1	100	18'-6"	12"	9 3/8"	0.2391" OR 0.25"	None			1'-6"	1'-4"	2"	1 3/4"ø x 42"	NONE	15'-0", 20'-0"	3'-0"	9'-0"
18-1-100			17'-0"				None							NONE			
19-1-100			30'-0"	14"	9 3/4"		10'-0"	11 1/8"	9 3/4"	1'-10"	1'-8"	2 1/2"	2"ø x 42"	6'-15" 12'-0"	25'-0", 30'-0"	3'-6"	10'-0"
19A-1-100			35'-0"		9"		15'-0"		9"					6'-15" 15'-0"			

INDICATES MAST ARM LENGTH TO BE USED UNLESS OTHERWISE NOTED ON PLANS.

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

REGISTERED CIVIL ENGINEER

April 20, 2018

PLANS APPROVAL DATE

THE STATE OF CALIFORNIA OR ITS OFFICERS AND AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

TO ACCOMPANY PLANS DATED

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

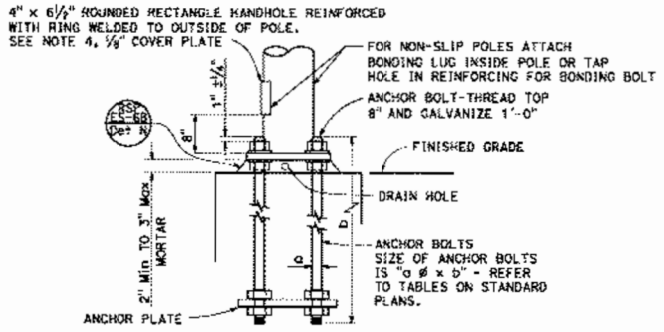
ELECTRICAL SYSTEMS (SIGNAL AND LIGHTING STANDARD, CASE 1 SIGNAL MAST ARM LOADING, WIND VELOCITY = 100 MPH AND SIGNAL MAST ARM LENGTHS 15' TO 30')

NO SCALE

RSP ES-7C DATED APRIL 20, 2018 SUPERSEDES RSP RSP ES-7C DATED JULY 21, 2017 AND RSP ES-7C DATED JULY 15, 2016 AND STANDARD PLAN ES-7C DATED OCTOBER 30, 2015 - PAGE 458 OF THE STANDARD PLANS BOOK DATED 2015.

REVISED STANDARD PLAN RSP ES-7C

2015 REVISED STANDARD PLAN RSP ES-7C



HANDHOLE AND ANCHORAGE
DETAIL A

IDENTIFICATION NUMBER

1. Attach a stamped metal tag with pole's identification number above the handhole. ¼" high number, minimum.
2. Attach a stamped metal tag with mast arm's identification number to the bottom of the signal mast arm near the pole plate. ¼" high number, minimum.

Type
Load case (use SL for special load case)
Design wind velocity (mph)
Signal mast arm length (ft) { Near handhole: Maximum signal mast arm length for pole type / Near pole plate: Installed signal mast arm length }
Standard plan year
Only for poles or mast arms using Detail F
Only for poles or mast arms using ES-7D

26A - 3 - 100 - 45 - 10 - F or FB

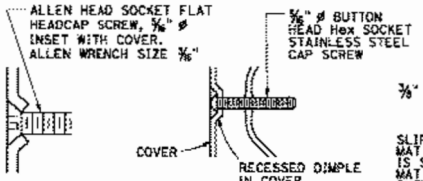
SAMPLE IDENTIFICATION NUMBER

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

REGISTERED CIVIL ENGINEER
April 20, 2018
PLANS APPROVAL DATE
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

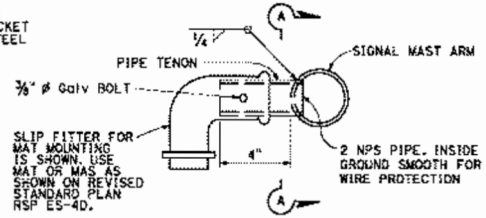
Stanley F. Ashraf No. (37792) Exp. 3-31-19 CIVIL STATE OF CALIFORNIA

TO ACCOMPANY PLANS DATED _____

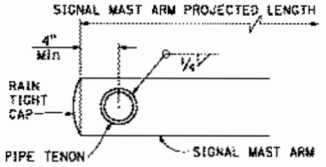


TYPICAL DETAIL
DETAIL B-1

ALTERNATIVE DETAIL
DETAIL B-2



SIDE TENON
DETAIL S-1



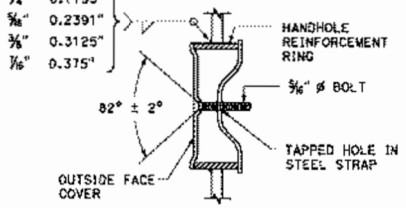
SECTION A-A

PIPE TENONS
DETAIL S

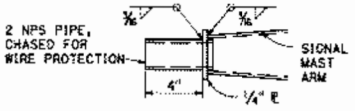
NOTES:

1. Provide a Hex nut, leveling nut and 2 washers for each bolt.
2. Luminaire mast arms shall be round, tapered steel tubes, taper of 0.1375" to 0.143-inch per foot with an end section 2⅜" OD for mounting hardware. Extensions of 2 NPS Standard pipe one 7" long may be used at the option of the manufacturer. When low pressure sodium luminaires are required, the extension shall be 1'-3".
3. Signal mast arms shall be round, tapered steel tubes, maximum taper 0.143-inch per foot.
4. Handhole reinforcement ring shall be ¼" x 2" for 0.1196" to 0.2391" thick poles, ⅜" x 2" for 0.3125" to 0.375" thick poles.
5. Handholes shall be located on the downstream side of traffic.
6. Detail F, fatigue resistant weld, is required at socket welded signal mast arm plate and pole base plate.
7. Cap screws shall be tightened by the turn-of-nut method ⅓ turn from a snug tight condition. No washer will be required.
8. Outside diameter, wall thickness, and corresponding section properties of poles and mast arms as shown in the Standard Plans are minimums. Unless otherwise specified, alternative sections shall require approval by the Engineer.
9. Design: AASHTO Standard Specifications for Structural Support for Highway Signs, Luminaires, and Traffic Signals, 6th Edition.
   Basic Wind Speed = 100 mph (3 seconds gust).
   Yearly Mean Wind Velocity = 15.6 mph.
10. Materials (Structural steel):
    fy = 55,000 psi (tapered steel tube and anchor bolts)
    fy = 50,000 psi (unless otherwise noted)
11. Materials (Reinforced concrete):
    f'c = 3,625 psi
    fy = 60,000 psi

WELD SIZE	WALL THICKNESS
⅜"	0.1196"
¼"	0.1793"
⅝"	0.2391"
⅜"	0.3125"
⅛"	0.375"

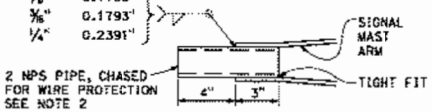


TAMPER RESISTANT HANDHOLE COVER
DETAIL B

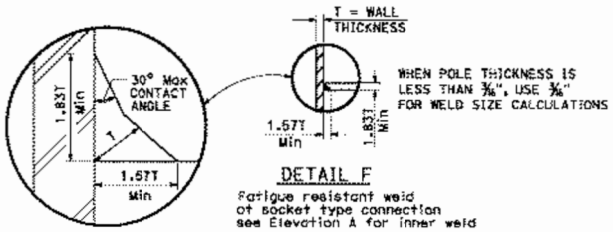


TIP TENON
DETAIL TL
This detail supersedes Detail S when so designated

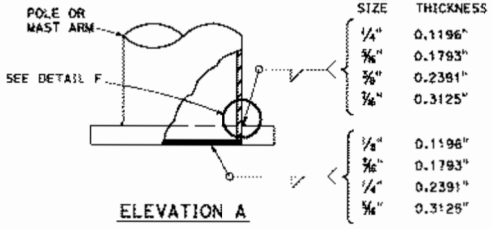
WELD SIZE	WALL THICKNESS
⅛"	0.1196"
⅜"	0.1793"
¼"	0.2391"



TIP TENON
DETAIL TS



DETAIL F
Fatigue resistant weld of socket type connection see Elevation A for inner weld



WELD SIZE	WALL THICKNESS
¼"	0.1196"
⅜"	0.1793"
⅝"	0.2391"
⅞"	0.3125"
⅛"	0.1196"
⅜"	0.1793"
¼"	0.2391"
⅝"	0.3125"

ELEVATION A

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

ELECTRICAL SYSTEMS (SIGNAL AND LIGHTING STANDARD, DETAIL No. 1)

NO SCALE

RSP ES-7M DATED APRIL 20, 2018 SUPERSEDES RSP ES-7M DATED JULY 15, 2016 AND STANDARD PLAN ES-7M DATED OCTOBER 30, 2015 - PAGE 467 OF THE STANDARD PLANS BOOK DATED 2015.

REVISED STANDARD PLAN RSP ES-7M

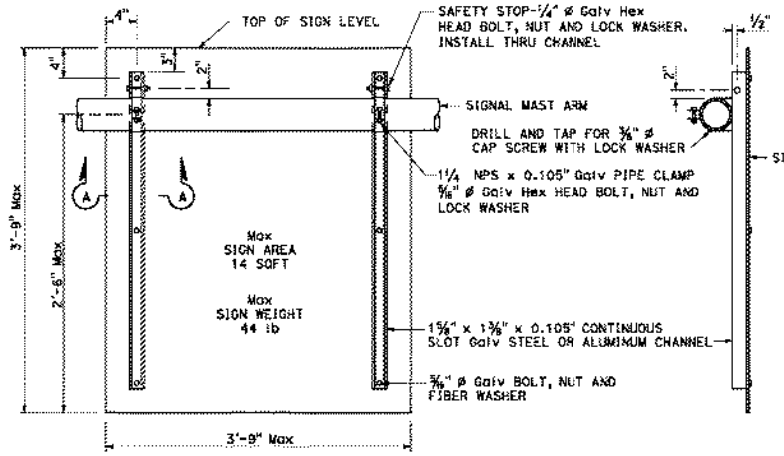
2015 REVISED STANDARD PLAN RSP ES-7M

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

REGISTERED CIVIL ENGINEER — July 15, 2016
PLANS APPROVAL DATE

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

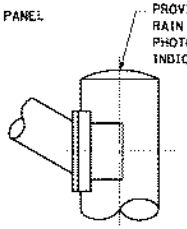
TO ACCOMPANY PLANS DATED _____



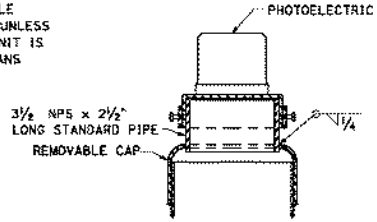
REAR VIEW

SIDE VIEW

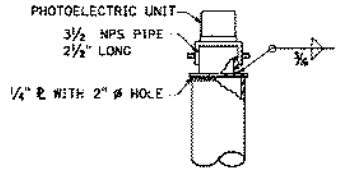
SIGN MOUNTING DETAILS
DETAIL U



STANDARD TOP
DETAIL B-1

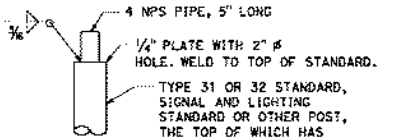


MOUNTING ADAPTER FOR PHOTOELECTRIC UNIT
DETAIL B-2

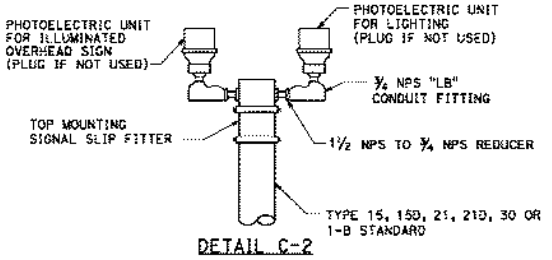


ALTERNATIVE MOUNTING ADAPTER
DETAIL B-3

POLE TOP DETAILS
DETAIL B

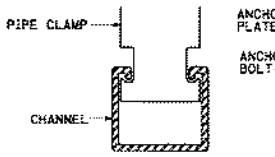


DETAIL C-1

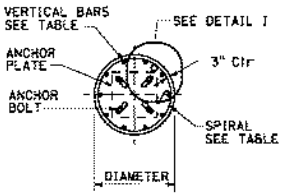


DETAIL C-2

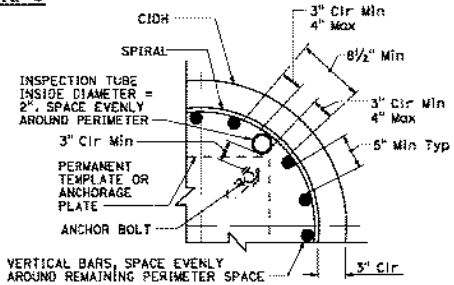
DUAL PHOTOELECTRIC UNIT MOUNTING DETAIL
DETAIL C



SECTION A-A



SECTION B-B

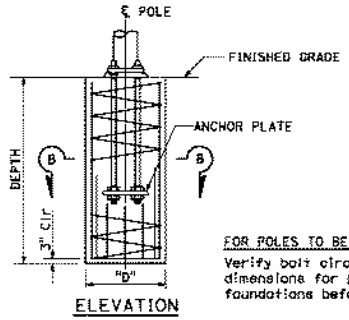


INSPECTION TUBE PLACEMENT
DETAIL I

CIDH REINFORCING AND INSPECTION TUBE SCHEDULE

CIDH DIAMETER	VERTICAL BARS	SPIRAL	INSPECTION TUBE
2 ft	8-#5	#4 AT 6	2
2.5 ft	10-#6		4*
3 ft	12-#7	#5 AT 6	
3.5 ft	14-#8		4
4 ft	18-#9	2-#4 AT 7	5
4.5 ft	18-#9	2-#5 AT 7	5
5 ft	22-#10	2-#5 AT 7	6
6 ft	26-#11	2-#6 AT 7	7

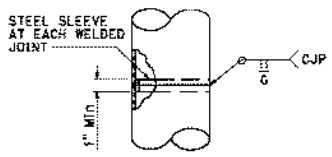
* FOR SLIP BASE VERSIONS WITH 3 ANCHOR BOLTS USE 3 INSPECTION TUBES.



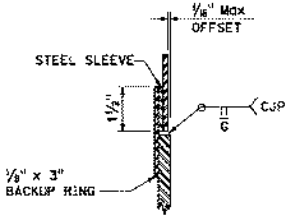
ELEVATION

FOR POLES TO BE INSTALLED ON EXISTING FOUNDATION:
Verify bolt circles, anchor bolt sizes and dependent dimensions for poles to be installed on existing foundations before fabricating the poles.

CAST-IN-DRILLED-HOLE PILE FOUNDATION, REINFORCED PILE
DETAIL A



FOR UNIFORM TUBE THICKNESS
DETAIL T-1



AT TUBE THICKNESS CHANGE
DETAIL T-2

POLE SPLICES
DETAIL T

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

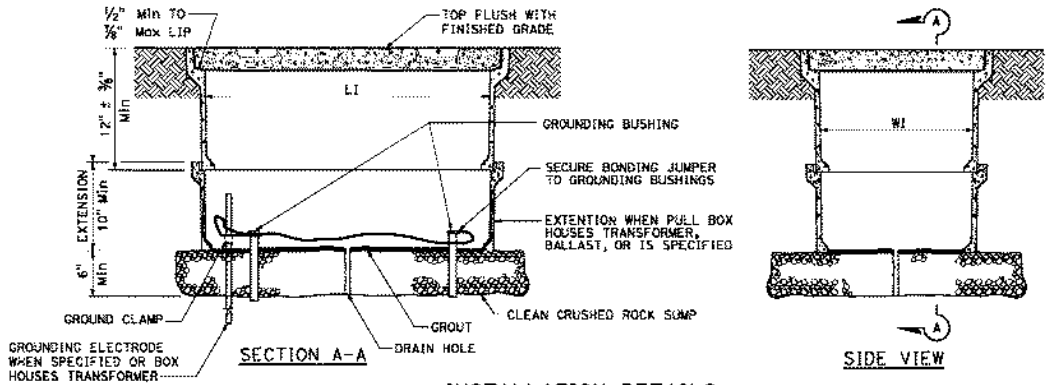
ELECTRICAL SYSTEMS (SIGNAL AND LIGHTING STANDARD, DETAIL No. 2)

NO SCALE

RSP ES-7N DATED JULY 15, 2016 SUPERSEDES STANDARD PLAN ES-7N DATED OCTOBER 30, 2015 - PAGE 468 OF THE STANDARD PLANS BOOK DATED 2015.

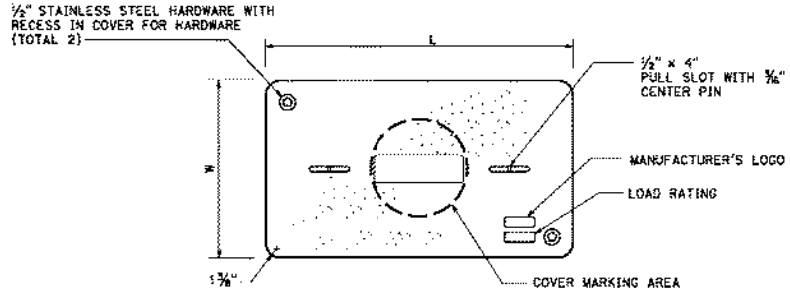
REVISED STANDARD PLAN RSP ES-7N

2015 REVISED STANDARD PLAN RSP ES-7N

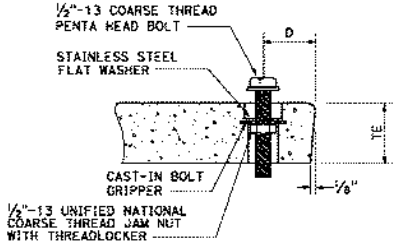


INSTALLATION DETAILS

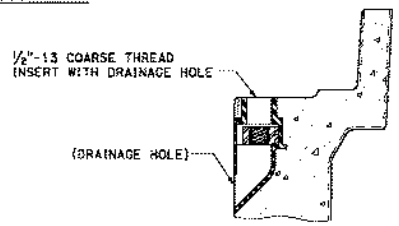
DETAIL A



COVER TOP VIEW



TYPICAL COVER CAPTIVE BOLT
OR SIMILAR



TYPICAL THREADED INSERT
OR SIMILAR

DIMENSION TABLE

PULL BOX	PULL BOX					COVER				
	MINIMUM DEPTH BOX	MINIMUM DEPTH EXTENSION	MINIMUM WEIGHT	LI Min	WI Min	7E	D	L	W	MINIMUM WEIGHT
No. 3½	12"	N/A	40 lb	1'-3"	9"	1¾"	1⅝"	1'-3¼" - 1'-3⅜"	10" - 10⅛"	30 lb
No. 5	12"	10"	55 lb	1'-8"	11"	2"	1⅞"	1'-11¼"	1'-1¾"	60 lb
No. 6	12"	10"	70 lb	2'-4¼"	1'-3¾"	2"	2"	2'-6½"	1'-5½"	85 lb

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

REGISTERED CIVIL/ELECTRICAL ENGINEER — Theresa Aziz Gabriel, No. E15129, Exp. 6-30-16, ELECTRICAL, STATE OF CALIFORNIA

April 15, 2016
PLANS APPROVAL DATE

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

TO ACCOMPANY PLANS DATED _____

NOTES:

1. The nominal dimensions of the opening in which the cover sets shall be the same as the cover dimensions except the length and width dimensions shall be ⅛" greater.
2. Covers and boxes shall be interchangeable with California standard male and female gages. When interchanged with a standard male or female gage, the top surfaces shall be flush within ⅛". Top outside radius of covers and pull boxes shall have a ⅜" radius.
3. Dimensions for the cover for non-traffic pull box are nominal values.

2015 REVISED STANDARD PLAN RSP ES-8A

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

ELECTRICAL SYSTEMS (NON-TRAFFIC PULL BOX)

NO SCALE

RSP ES-8A DATED APRIL 15, 2016 SUPERSEDES STANDARD PLAN ES-8A DATED OCTOBER 30, 2015 - PAGE 473 OF THE STANDARD PLANS BOOK DATED 2015.

REVISED STANDARD PLAN RSP ES-8A

DIST	COUNTY	ROUTE	POST MILES (TOTAL PROJECT)	SHEET NO.	TOTAL SHEETS

REGISTERED CIVIL ENGINEER

July 15, 2016
PLANS APPROVAL DATE

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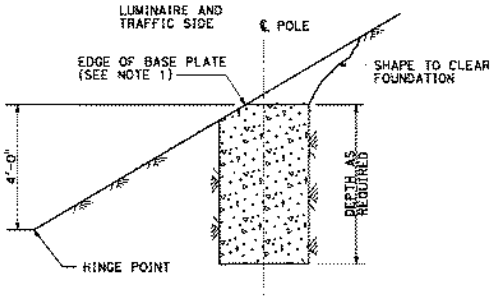
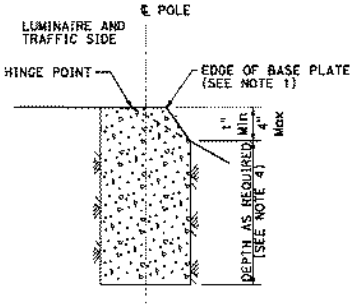
REGISTERED PROFESSIONAL ENGINEER — Stacey P. Johnson — No. 69793 — Exp. 3-31-18 — CIVIL — STATE OF CALIFORNIA

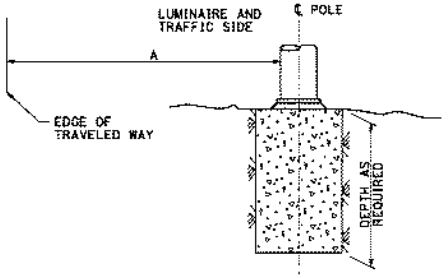
TO ACCOMPANY PLANS DATED _____



CUT SLOPES
STEEPER THAN 4:1,
LESS THAN 2:1
DETAIL A-1
See Note 2 and 3



FILL SLOPES
STEEPER THAN 4:1,
LESS THAN 2:1
DETAIL A-2
See Note 2 and 3



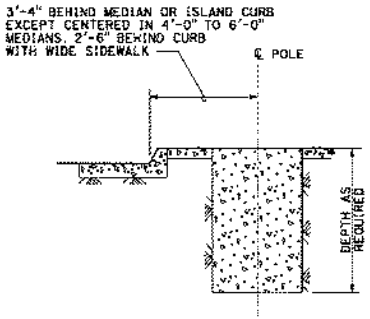
FLAT SECTIONS, CUT OR FILL SLOPES
4:1 OR FLATTER
DETAIL A-3
See Note 2

STANDARD TYPE	SETBACK (DIMENSION A)
32	30'-0" (Min)
31	20'-0" (Min)
15, 15D, 15-SB, 21, 21B, 30	ARM LENGTH (Min)

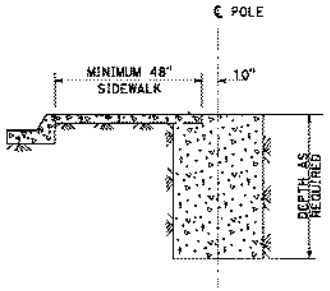
FOUNDATIONS ADJACENT TO ALL ROADWAYS EXCEPT IN SIDEWALK, MEDIAN AND ISLAND AREAS
DETAIL A

NOTES:

1. Where a portion of the foundation is above grade, the top edges shall have a 1" chamfer.
2. Slopes shall be horizontal to vertical ratio (Horizontal : Vertical).
3. Horizontal setbacks on cut and fill slopes steeper than 4:1 shall not exceed the distance shown for flat sections.
4. CIDH embedment depth shall be increased beyond standard depths by the diameter of the CIDH.



MEDIAN, ISLAND
OR WIDE SIDEWALK
DETAIL B-1
7' Wide and wider



NARROW SIDEWALK
DETAIL B-2
Less than 7' wide

FOUNDATIONS IN SIDEWALK, MEDIAN AND ISLAND AREAS
DETAIL B

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

ELECTRICAL SYSTEMS (FOUNDATION INSTALLATIONS)

NO SCALE

RSP ES-11 DATED JULY 15, 2016 SUPERSEDES STANDARD PLAN ES-11 DATED OCTOBER 30, 2015 - PAGE 463 OF THE STANDARD PLANS BOOK DATED 2015.

REVISED STANDARD PLAN RSP ES-11

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

REGISTERED ELECTRICAL ENGINEER

July 21, 2017
PLANS APPROVAL DATE

Hamid Zolfaghari
No. E15636
EXP 12-31-17
ELECTRICAL
REGISTERED PROFESSIONAL ENGINEER
STATE OF CALIFORNIA

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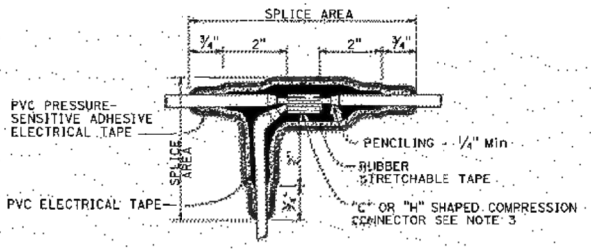
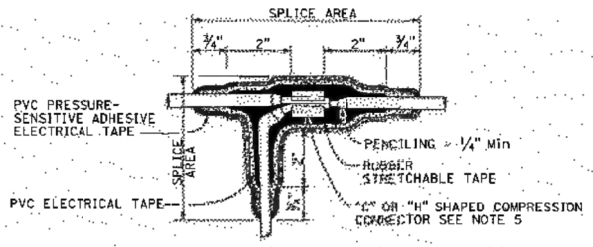
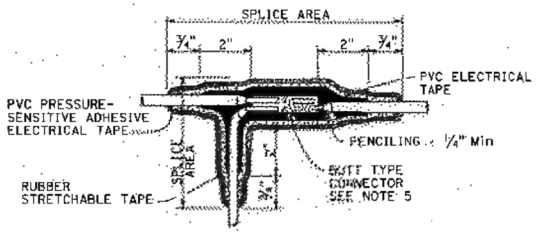
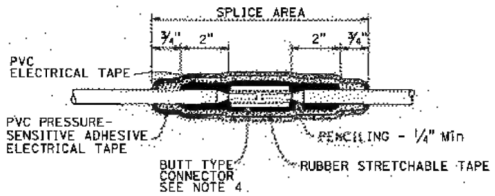
TO ACCOMPANY PLANS DATED _____





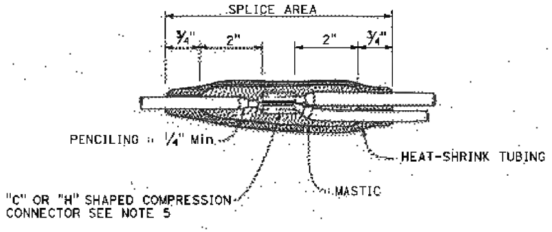


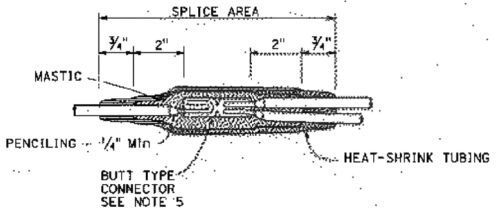


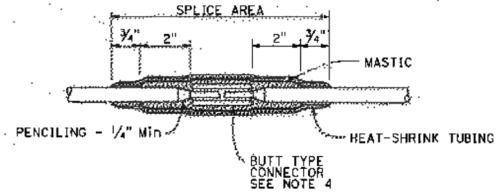
TYPICAL SPLICE INSULATION METHOD B

NOTES:

1. Dimensions are minimum.
2. Rubber tapes shall be rolled after application.
3. Between 1 free-end and 3 through conductor.
4. Between 2 free-end conductors.
5. Between 3 free-end conductors.







TYPICAL SPLICE INSULATION HEAT-SHRINK TUBING

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

ELECTRICAL SYSTEMS (SPLICE INSULATION METHODS DETAILS)

NO SCALE

RSP ES-13A DATED JULY 21, 2017 SUPERSEDES RSP ES-13A DATED APRIL 15, 2016 AND STANDARD PLAN ES-13A DATED OCTOBER 30, 2015 - PAGE 484 OF THE STANDARD PLANS BOOK DATED 2015.

REVISED STANDARD PLAN RSP ES-13A

2015 REVISED STANDARD PLAN RSP ES-13A

4-1-13

ANAHEIM CANYON METROLINK STATION IMPROVEMENTS PROJECT

IFB 0-2193

Volume 2

CONTRACT TECHNICAL SPECIFICATIONS

APPENDIX B

CITY OF ANAHEIM SPECIAL PROVISIONS

FOR

All Work Performed Within the City Right-of-way

(RCP2018-14332)

THE FOLLOWING ARE SUPPLEMENTAL CITY OF ANAHEIM SPECIFICATIONS AND PROVISIONS TO THE PROJECT SPECIFICATIONS.

The City of Anaheim has adopted the 2012 Edition and subsequent Supplements thereto, of the Standard Specifications for Public Works Construction by Public Works Standards, Inc., and the City of Anaheim Standard Specification Supplement found in the City Website as its Specifications for Public Works Construction Projects. Improvements within the City of Anaheim Right-of-Way shall be performed in accordance with the appropriate provisions of that publication, as designated in the Special Provisions, except as modified in the Standard Specification Supplement and the Special Provisions.

The SSPWC set forth above will control the General Provisions and construction methods and materials for the improvements within the City's right-of-way, except as amended by the plans, special provisions, or other contract documents. The following provisions are intended to supplement the provisions of the SSPWC unless noted otherwise. The section numbers of these provisions coincide with the section numbers of the SSPWC. Only those sections that require additions, deletions, or revisions are included herein.

Payment for conformance to the requirements of these Supplemental City of Anaheim Specifications and Provisions to the Project Specifications shall be deemed to be included in the price bid for various item of work and no additional compensation will be allowed therefore.

PART 1 – GENERAL PROVISIONS

SECTION 5, Utilities

5-2 Protection

Add the following:

Protect all overhead and underground structures in place and maintain proper working clearance per GO95, GO128 issued by the State of California Public Utilities Commission, and Anaheim Public Utilities (APU) Electrical Engineering Construction Standard C0550-12. It is the contractor's responsibility to ascertain ALL existing overhead and underground electrical facilities including street lights and protect in-place or relocate per APU Electrical Engineering Construction Standards. If relocation or removal of existing facilities is required, the contractor must contact Electrical Engineering (714) 765-4211 for assistance.

Contractor shall locate, verify, and protect all existing utility facilities in the immediate vicinity of the work as stated.

SECTION 7, Responsibilities of the Contractor

7-3 Liability Insurance

INDEMNIFICATION AND LIABILITY INSURANCE

Contractor shall agree to release and to indemnify and hold harmless the City of Anaheim, a municipal corporation, hereinafter referred to as "CITY", its officers, agents, employees, and representatives for damage to property or for injury to or death of any persons and from all claims, demands, actions, of any kind whatsoever, arising out of or encountered in connection with this project or the prosecution of work under it, whether such claims, demands, actions, or liability are caused by CONTRACTOR, CONTRACTOR's agents or employees or products installed on the Project by CONTRACTOR or subcontractors, excepting only such injury, death, or damages as may be caused solely and exclusively by CITY. Such indemnification shall extend to all claims, demands, actions, or liability for injuries, death or damages, occurring after completion of the Project as well as during the work's progress. CONTRACTOR agrees that it shall at its own cost, expense and risk, defend CITY, its officers, agents, employees, and representatives in any and all claims, demands, actions, suits or other legal proceedings which may be brought or instituted against CITY, its officers, agents, employees, or representatives.

Prior to start of any work the Contractor shall obtain the applicable City permits and make arrangements for City inspections. The Contractor and all subcontractors shall each obtain a City business license, and shall be licensed in accordance with State Business and Professions Code. The contractor shall also obtain and pay for any and all other permits, licenses, inspections, certificates, or authorizations required by any governing body or entity.

The Contractor shall obtain all necessary permits for the discharge or disposal of any ground or surface waters in accordance with the California Regional Water Quality Control Board Regulations.

CONTRACTOR shall procure and maintain throughout the term of this project, public liability and property damage insurance in an amount not less than One Million Dollars ($1,000,000.00) for injuries, including death, for any one or more persons and subject to the same limit for each person in an amount not less than One Million Dollars ($1,000,000.00) on account of any one accident, and property damage insurance in an amount not less than One Million Dollars ($1,000,000.00). CONTRACTOR shall also procure and maintain during the term of this Project Workers' Compensation Insurance covering all its employees in the Project in a company satisfactory to the Orange County Transportation Authority, hereinafter referred to as "OCTA", and CITY. CONTRACTOR shall furnish to CITY certificates issued by such insurance companies showing that all the above-mentioned insurance has been issued and is in full force and effective and providing thirty (30) days written notice prior to any cancellation, termination, nonrenewal, or reduction of said insurance. The certificates of insurance shall be submitted to CITY prior to obtaining the City's Grading and Right-of-Way Construction Permits and prior to commencing work on this Project. CONTRACTOR shall secure from said insurance companies an endorsement to CONTRACTOR's said insurance policies naming CITY, its officers, agents, employees and representatives as additional insureds. Said endorsement shall provide coverage to CITY, its officers, agents, employees and representatives as additional insureds for the term of this Project. A signed copy of said endorsement shall be furnished to CITY prior to obtaining the City's Grading

and Right-of-Way Construction Permits. CONTRACTOR shall be responsible for the insurance coverage as herein provided of all employees of any subcontractors. The Contractor shall not commence work under this Project until he has obtained all insurance required hereunder with a company or companies acceptable to the City, nor shall the Contractor allow any subcontractor to commence work in his subcontract until all insurance required of the subcontractor has been obtained.

In case any employee engages in hazardous work under this Project and is not protected under the Workers' Compensation Act, CONTRACTOR shall provide, or cause to be provided, appropriate insurance for the protection of all such employees not otherwise protected. CONTRACTOR shall likewise obtain public liability and property damage insurance to cover vehicles used or maintained by CONTRACTOR in the performance of said work connected with the Project, with liability limits of not less than One Million Dollars ($1,000,000.00) for any one or more persons and One Million Dollars ($1,000,000.00) for any one accident, and property damage of One Million Dollars ($1,000,000.00) for any one accident, and property damage of One Million Dollars ($1,000,000.00).

The Insurance policy shall provide the following minimum limits, unless OCTA requires higher minimum limits:

Bodily injury including	$1,000,000 each person
Accidental death	$1,000,000 each accident
Property damage and	
Public liability	$1,000,000 each person
(including coverage of	
vehicles used by the	$1,000,000 each accident
Contractor on or off the premises)	$1,000,000 property damage

Each of the above policies shall specify that it acts as the primary insurance and that no insurance held or owned by the designated additional insured shall be called upon to cover a loss under said policy.

If CONTRACTOR fails to maintain the aforementioned insurance or secure the aforementioned endorsement, CITY may revoke the City's Grading and Right-of-Way Construction Permits for this project and the City shall have the right to order CONTRACTOR to stop work until contractor demonstrates compliance with the requirements hereof.

Nothing herein contained shall be construed as limiting in any way the extent to which CONTRACTOR may be held responsible for payment of damages to persons or property resulting from CONTRACTOR's operations or any operations of any subcontractors under it.

The CONTRACTOR shall defend (at City's option), hold harmless, and indemnify the City of Anaheim, and City's officers, agents, employees, representatives, and volunteers from and against and from all claims and liability arising from damage and injury due to defects in workmanship or materials. The Contractor shall make all repairs and replacements promptly upon receipt of written order from the Engineer and/or City Inspector. If the CONTRACTOR

fails to make the repairs and replacements promptly the City may do the work and the CONTRACTOR shall be liable to the City for the cost of the work.

Payment for conformance to the requirements of this section shall be deemed to be included in the price bid for the various items of work. No additional compensation will be allowed therefore.

7-7 COOPERATION AND COLLATERAL WORK

The Contractor shall cooperate with the City of Anaheim, property owners, various utility companies, and other interested parties within or adjacent to the limits of the work.

It shall be the responsibility of the Contractor to schedule his work and that of his subcontractors to produce a smooth flow of work in a competent manner. All Contractors on this project shall cooperate with each other scheduling their work.

7-8 WORKSITE MAINTENANCE

7-8.1 General

The Contractor shall perform all cleanup work (including the use of a motorized sweeper with vacuum to sweep and clean the street) at the end of each working day during the construction.

The following shall be inserted after the first paragraph:

Materials and equipment shall be removed from the site as soon as they are no longer necessary. Before the final inspection, the site shall be cleared of equipment, unused materials, rubbish, and all markings placed by the Contractor, the City, Underground Service Alert (USA), or other agent(s)' markings necessary for the performance of various items of work. These markings shall include, but not limited to paint, stakes, and metal tags.

Before the final inspection, the site shall also be cleared of all detour traffic signs and equipment(s), including all detour signs posted or attached to power poles, street light structures, utility poles or structures, etc., all inclusive of the project. All detour traffic signs installed and posted by others and are not a part of the contracted work shall remain and shall be protected in place.

The last paragraph is amended as follows:

Failure of the Contractor to comply with the City's and/or Engineer's cleanup orders, including removal of markings and associated detour signs and equipment(s) shall result in an order by the City to suspend work until all areas impacted by the construction site have been cleaned and all conditions corrected, to the satisfaction of the City and/or Engineer.

7-9 PROTECTION AND RESTORATION OF EXISTING IMPROVEMENTS

The Contractor shall relocate, repair, replace or re-establish all existing improvements within the project limits which are not designated for removal (e.g. curbs, gutters, sidewalks, driveways, fences, walls, irrigated systems, signs, utility installations, pavements, structures, landscaping, etc.) which are damaged or removed as a result of his operations or as required by the Plans and Specifications. Damaged or removed traffic signal detector loops and or irrigations systems shall be replaced or repaired and returned to service within seventy (72) hours, unless otherwise directed by the City. Where existing traffic striping, pavement markings, and curb markings are damaged or the reflectivity reduced by the Contractor's operations, such striping or marking shall also be considered as existing improvements and the Contractor shall repaint or replace such improvements.

Relocations, repairs, replacements or re-establishments shall be at least equal to the existing improvements and shall match such improvements in finish and dimensions unless otherwise specified.

Contractor shall maintain and water existing landscape designated to be protected-in-place, including hand watering if necessary. Should the Work interrupt the irrigation system of adjacent landscape and / or landscape designated to remain within the limits of work, contractor shall provide temporary water to maintain the health of the plant material, as required. Payment for this work shall be included in the various items of work and no additional compensation shall be allowed therefore. Any landscape areas damage by the Contractor's construction operations shall be replaced or restored in as near the original condition as reasonable.

All costs to the Contractor for protecting, removing, restoring, relocating, repairing, replacing, re establishing and/or supporting existing improvements shall be included in the Bid.

7-10 PUBLIC CONVENIENCE AND SAFETY

Insert the following:

The Contractor shall take all necessary precautions to protect the public, especially children, from the hazards of open excavations. Trenches shall either be covered or adequately fenced and lighted at night and on weekends or whenever operations are not in actual process.

Unusual conditions may arise on the work which will require that immediate and unusual provisions be made to protect the public from danger or loss or damage to life and property, due directly or indirectly to the prosecution of the work. It is part of the service required of the contractor to make such provisions and to furnish such protection.

The Contractor shall use such foresight and shall take such steps and precautions as his operations make necessary to protect the public from danger or damage, loss of life or property, which could result from the interruption or contamination of public water supply, irrigation or other public service or from the failure of partly completed work.

Whenever, in the opinion of the City or OCTA, an emergency exists against which the Contractor has not taken sufficient precaution for the safety of the public or the protection of the

utilities or of adjacent structures or property which may, in the opinion of the City or OCTA, require immediate action in order to protect public or private or personnel or property interest or prevent likely loss of human life or damage on account of the operations under the contract, then and in that event the City or OCTA may provide suitable protection to said interest by causing such work to be done and material to be furnished, as, in the opinion of the City or OCTA, may seem reasonable and necessary.

The cost and expense of said labor and material together with the cost and expense of such repairs as may be deemed necessary shall be borne by the Contractor, and if he shall not pay said cost and expense upon presentation of the bills therefore, duly certified by the Engineer, then said cost and expense will be paid by the City or OCTA and shall therefore be deducted from any amounts due, or which may become due to said Contractor. Failure of the City or OCTA, however, to take such precautionary measure, shall not relieve the Contractor of his full responsibility for public safety.

The foregoing provisions are in addition to and not in limitation of any other rights or remedies available to the City or OCTA.

7-10.1 Access

7-10.1.1 General

The following paragraphs shall be inserted after the second paragraph:

The Contractor shall provide and install barricades, delineators, warning devices and construction signs in accordance with the current Caltrans Manual of Traffic Controls for Construction and Maintenance Work Zones and Work Area Control Handbook, latest edition, and maintain them in new or like new condition for the duration of the construction project, unless otherwise approved by the City. During adverse weather or unusual traffic or working conditions, additional traffic devices shall be placed as directed by the City. Portable Changeable Message Signs (CMS) shall conform to the requirements of Caltrans Standard Specifications 2018 Revised Edition and as **amended in the following sections:**

1. Each portable changeable message sign unit shall consist of a controller unit, a power supply and a structural support system, all mounted on a trailer. The unit shall be assembled to form a complete self-contained portable changeable message sign which can be delivered to the site of the work and placed in immediate operation. The complete message sign unit shall be capable of operating in an ambient air temperature range of -30° F to +165° F and shall not be affected by unauthorized mobile radio transmissions. The trailer shall be equipped so that it can be leveled and plumbed.

2. The message displayed on the sign shall be visible from a distance of 1,500 feet and shall be legible from a distance of over 1,250 feet, at noon on a cloudless day, by persons with vision of or corrected to 20/20 and capable of displaying messages in two font sizes. The sign panel shall be **3-line matrix, each of which shall contain eight (8) display panels**. Sign shall utilize lens enhanced all LED (light-emitting diode) display providing for both daylight and nighttime legibility.

CMS "display" shall be re-programmed at any time during the course of construction, as deemed necessary and as directed by the Engineer and the City. Re-programmed messages shall include but not be limited to visibility for speed control, advisories on alternate routes, and advisories on general/critical construction activities including schedule. Re-programming these messages offers continuous notices for the benefit of the public. Messages/advisories shall all be approved by the Engineer and the City.

3. The sign face shall be flat black and shall be protected from glare of the sun by a method which does not interfere with the clarity of the sign message. The sign shall be raised and lowered by means of a power driven lifting mechanism provided with a mast safety pin to prevent the sign case from falling in the event of a power/hydraulic system failure. The mechanism shall include an auxiliary manual pump with release for emergency use.

4. The matrix sign shall be capable of complete alpha numeric selection.

5. The controller or CPU (Central Processing Unit) shall be an all solid-state unit containing all the necessary circuitry for the storage of at least 5 preprogrammed messages. A keyboard entry system shall be provided to allow an operator to generate an infinite number of additional messages over the preprogrammed stored messages. Message memory shall be retained during power interruptions or failures, and the unit shall be capable of operating the sign system in the event that the controller is disconnected. The controller shall provide for a variable message display rate which allows the operator to match the information display to the speed of the approaching traffic. The flashing off time shall be operator adjustable within the control cabinet. The system shall be equipped with a security lockout feature to prevent unauthorized use of the controller. The controller shall be installed in a location allowing the operator to perform all functions from one position.

6. Full operation height shall be with the bottom of the sign at least 7 feet above the ground and the top no more than 14.5 feet above the ground, or as designated by the City.

7. After initial placement, portable changeable message signs may be moved from location to location as directed by the Engineer and/or City.

The Contractor shall notify the City a minimum of 5 working days prior to closing or restricting left-turn movements. A minimum of 48 hours prior to restricting left-turn movements and/or closing left-turn pockets, the Contractor shall post sign in advance of and in the area of the

closure or restriction. The signs, as a minimum, shall notify the public of the date(s) of the closure and the duration.

Judgment as to adequate or sufficient barricading and signing shall be that which is sufficient and adequate in the opinion of the City.

The Contractor shall relocate, preserve and maintain the visibility of all existing signs within the project limits which affect the flow of traffic, as directed by the City. Any signs which are damaged or found to be missing during the course of construction shall be replaced by the Contractor at his expense as directed by the City. All other signs that interfere with the course of work and are not necessary for the safe flow of traffic shall be removed and replaced by the Contractor as directed by the City. Traffic control signs include Stop Signs, Speed Limit, Parking Restriction and other regulatory signs.

7-10.1.1.1 Vehicular Access

Insert the following after the first paragraph:

Temporary AC shall be placed at all approaches to form a smooth transition between the street and drive approach. The Contractor shall maintain the temporary AC until such time the permanent pavement is constructed.

7-10.1.1.2 Pedestrian Access

Contractor is responsible in providing, developing and maintaining pedestrian access. Contractor shall route pedestrian access and shall be incorporated in the approved construction drawings; this pedestrian access route(s) shall be incorporated in both Phasing Plan (if project requires work to be installed/constructed in different phases) and Traffic Control Plans.

7-10.2 Work Area Traffic Control

All Traffic Control Plans for closures within the City Right-of-Way shall be reviewed and approved by the City prior to start of any closures. All Traffic Control Plans for closures within the City Right-of-Way shall be submitted to the City's Public Works Department for review and approval.

The Contractor shall notify the occupants of all affected properties at least forty eight (48) hours prior to any temporary obstruction of access. No overnight closure of any driveway will be allowed except as permitted by the City.

The Contractor shall maintain reasonable access to all businesses and residents at all times.

At least one (1) twelve foot (12') wide traffic lane shall be provided for each direction of travel on all streets at all times, except as permitted by the City. The traffic lanes shall be maintained on pavement, and shall remain unobstructed.

The Contractor shall install detour signs per approved Traffic Control Plans. Detour signs posted or attached to power poles, street light structures, utility poles or structures, etc., shall bear the Project Name and Contractor's Name written legibly on the back of each sign posted or installed. At the completion of the project, these detour signs shall be cleared off the area.

Drive approaches shall be opened at the end of the normal recommended concrete curing time.

A minimum of seven (7) days prior to the start of construction, the Contractor shall install informational signs for the project, as directed by the City and/or Engineer. As a minimum, the information on the sign shall include the following:

a. Start date of construction
b. Completion date
c. Lane restrictions
d. Information phone number

7-10.4 Safety

The Contractor shall comply with "Construction Safety Orders" of the State Division of Industrial Safety except where "Federal Safety and Health" regulations are more stringent, in which case such federal rules shall apply.

7-10.5.3 Steel Plate Covers

Insert the following after the first paragraph:

Excavations or trenching shall not be left open during non-working hours. They shall be backfilled, plated over with traffic bearing steel plates (when opened to traffic) or securely fenced and lighted with 6 foot high chain link fencing or equivalent, with temporary lighting as appropriate.

Open trenches that are required to be opened to traffic shall be backfilled, plated over with traffic bearing steel plates recessed, flush with adjacent roadway surfaces, unless otherwise directed by the City. The Contractor shall comply with the following in installing the recessed trench plates:

a. Provide a minimum 12" lap of steel plate on each side of trench to assure no slipping of plate or collapsing of trench wall. Where 12" lap cannot be met, engineering design is required and shall be approved by the City Engineer. Trench shoring including overlap must be based on shoring calculations.

b. Steel plate must fit snug within the recessed area and installed to operate with minimum noise.

c. The pavement shall be cold planed to a depth equal to the thickness of the plate and to a width and length equal to the dimensions of the plate.

d. Multiple plates must be tack welded as needed to secure plates, 6" minimum.

e. All plates must meet required traffic loads, and be skid-resistant. The Contractor shall be responsible for the appropriate selection and maintenance of the steel plates.

f. Steel plates must be removed and permanent pavement shall be placed within fifteen (15) working days or as approved by the City.

g. Advance warning signs "steel plates ahead" shall be placed.

PART 2 CONSTRUCTION MATERIALS

SECTION 200 Rock Materials

200-1 Rock Products

200-1.4 Coarse Aggregate for Portland Cement Concrete

The Cleanness Value requirement of Section 200-1.4 shall be replaced with the following:

Tests	Test Method No.	Requirements
Cleanness Value	California 227	
Individual Test		70 Min*
Moving Average		75 Min*

200-1.5 Sand

200-1.5.3 Sand for Portland Cement Concrete

The sand equivalent requirement of Section 200-1.5.3 shall be replaced with the following:

Tests	Test Method No.	Requirements
Sand Equivalent	California 217	
Individual Test		70 Min*
Moving Average		75 Min*

* For 2500 or less class concrete, except concrete pavement, a minimum 65 Individual Test Result and a minimum 70 Moving Average will be acceptable if 2500 psi (17 mpa) 28-day strength criteria of Section 201-1.1.4 are met, at 6" (150 mm) slump or greater. The EMA Materials Laboratory will make the testing and acceptance determination.

Evaluation of Sand Equivalent and Cleanness Value shall conform to the provisions of Subsection 400-1.1.3.

SECTION 201 Concrete, Mortar and Related Materials

201-1 Portland Cement Concrete

201-1.1.2 Concrete Specified by Class and Alternate Class
Insert the following after the last sentence in the first paragraph:

For 2500 class concrete, a prequalified mix design may be used in accordance with the provisions of ACI 318-71, /section 4.2.2.1 in which f'c = 17 mpa (2500 psi).

201-1.2. Materials

201-1.2.1 Portland Cement

The allowable cement type in the first paragraph of this section is revised as follows:

The cement type requirement, Section 201-1.2.1, shall conform to ASTM C 150 and the low alkali requirements of Table 1A therein.

SECTION 212 – Landscape and Irrigation Materials

It is the Contractor's responsibility to inventory existing parkway irrigation and landscaping prior to starting any work. Contractor shall take pictures and video of parkway prior to starting work. Contractor shall replace in kind any damaged/removed irrigation and plantings within the parkway area.

Perform all work for landscaping and irrigation in parkways, as shown on the Plans. Recycled mulch shall be placed on the soil to help moisture retention as well as fight weed growth.

212-1 Landscape Materials

212-1.1 Topsoil

212-1.1.2 Class "A" Topsoil

Modify definition of Class 'A' Topsoil as follows. Add the following:

Suitable Import, Borrow Topsoil or Reclaimed Soil

General - Topsoil shall be free of roots, clods, stones larger than 1-inch in the greatest dimension, pockets of coarse sand, noxious weeds, sticks, lumber, brush and other litter. It shall not be infested with nematodes or other undesirable disease-causing organisms such as insects and plant pathogens. No on-site amendment to the material to achieve Class "A" status will be permitted.

Topsoil shall be friable and have sufficient structure in order to give good tilth and aeration to the soil.

Gradation limits - soil shall be a sandy loam. The definition of soil texture shall be the USDA classification scheme. Gravel over 2 millimeters in diameter shall be less than 10% by weight.

Permeability Rate - Hydraulic conductivity rate shall be not less than one inch per hour nor more than 20 inches per hour when tested in accordance with the USDA Handbook Number 60, method 34b or other approved methods.

Fertility - The range of the essential elemental concentration in soil shall be as follows:

Ammonium Bicarbonate/DTPA Extraction
parts per million (mg/kilogram)

dry weight basis

phosphorus	2 - 40
potassium	40 - 220
iron	2 - 35
manganese	0.3 - 6
zinc	0.6 - 8
copper	0.1 - 5
boron	0.2 - 1
magnesium	50 - 150
sodium	0 - 100
sulfur	25 - 500
molybdenum	0.1 - 2

Soil may need to be amended and conditioned to optimize plant growth. The above listed fertility is for soil selection.

Concentration of nutrients for final acceptance after amending

Ammonium Bicarbonate/DTPA Extraction

parts per million (mg/kilogram)

dry weight basis

phosphorus	10 - 40
potassium	100 - 220
iron	5 - 35
manganese	0.6 - 6
zinc	1 - 8
copper	0.3 - 5
boron	0.2 - 1
magnesium	50 - 150
sodium	0 - 100
sulfur	25 - 500
molybdenum	0.1 – 2

Acidity - The soil pH range measured in the saturation extract (Method 21a, USDA Handbook Number 60) shall be 6.0 - 7.9.

Salinity - The salinity range measured in the saturation extract (Method 3a, USDA Handbook Number 60) shall be 0.5 - 2.5 dS/m.

Chloride - The maximum concentration of soluble chloride in the saturation extract (Method 3a, USDA Handbook Number 60) shall be 150 mg/l (parts per million).

Boron - The maximum concentration of soluble boron in the saturation extract (Method 3a, USDA Handbook Number 60) shall be 1 mg/l (parts per million).

Sodium Adsorption Ratio (SAR) - The maximum SAR shall be 3 measured per Method 20b, USDA Handbook Number 60.

Aluminum – Available aluminum measured with the Ammonium Bicarbonate/DTPA Extraction shall be less than 3 parts per million.

Soil Organic Matter Content - Sufficient soil organic matter shall be present to impart good physical soil properties but not be excessive to cause toxicity or cause excessive reduction in the volume of soil due to decomposition of organic matter. The desirable range is 3% to 6%. The carbon: nitrogen ratio should be about 10. A high carbon: nitrogen ratio can indicate the presence of hydrocarbons or non-humified organic matter.

Calcium Carbonate Content - Free calcium carbonate (limestone) shall not be present for acid loving plants.

Heavy Metals - The maximum permissible elemental concentration in the soil shall not exceed the following concentrations:

Ammonium Bicarbonate/DTPA Extraction
parts per million (mg/kilogram)

	dry weight basis
arsenic	1
cadmium	1
chromium	10
cobalt	2
lead	30
mercury	1
nickel	5
selenium	3
silver	0.5
vanadium	3

If the soil pH is between 6 and 7, the maximum permissible elemental concentration shall be reduced 50%. If the soil pH is less than 6.0, the maximum permissible elemental concentration shall be reduced 75%. No more than three metals shall be present at 50% or more of the above values.

Phytotoxic constituent, herbicides, hydrocarbons etc. - Germination and growth of monocots and dicots shall not be restricted more than 10% compared to the reference soil. Total petroleum

hydrocarbons shall not exceed 50 mg/kg dry soil measured per the modified EPA Method No. 8015. Total aromatic volatile organic hydrocarbons (benzene, toluene, xylene and ethylbenzene) shall not exceed 0.5 mg/kg dry soil measured per EPA Methods No. 8020.

In order to ensure conformance, samples of the imported soil shall be submitted to Wallace Laboratories and approved by the Engineer for analysis prior to use. Results of testing shall be delivered to the Engineer for approval. The soil test shall include analysis and recommendations for amendment.

212-1.2 Soil Fertilizing and Conditioning Materials

212-1.2.4 Organic Soil Amendment.

Organic soil amendment shall be as specified based on agricultural suitability soils tests performed prior to grading. An additional soil test shall be performed after grading operations and prior to plant installation.

212-1.2.5 Mulch.
Mulch shall be as specified on the drawings. Submit sample for review and approval by City's Representative prior to material delivery on-site.

212-1.4 Plants.

212-1.4.1 General.

Add the following:

Varieties shall be as shown on the drawings.

All quantities shall be verified by an actual count on the drawings.

Plants, including trees, shrubs, and ground covers, shall have been grown in nurseries inspected by the State Department of Agriculture.

Inspection and approval of plants is required. Engineer may reject entire lot of plants represented by defective samples. Plants not approved are to be removed from site immediately and replaced with suitable plants. All plants will be inspected on site of work prior to installation, and at any time during progress of the work.

Tag plant materials and name and size in accordance with standards of practice recommended by American Association of Nurserymen.

Size of tree and shrub containers shall be as stated on the planting plan. Container stock shall have grown in containers for at least 6 months, but not over 2 years. Samples shall be shown to prove that no root bound conditions prevail. No containers shall be planted, except upon specific approval.

Do not prune prior to delivery, except by specific approval.

Protect all plants from damage by sun, wind, or rain at all times before planting.

Plants shall have grown under climatic conditions comparable to those of the project site, unless otherwise specifically approved by the Engineer.

212-1.6 Landscape Materials. Add New Section"

212-1.6.1 Filter Cloth. Filter cloth shall be a geo-textile fabric, as specified in table 213-2.2 (A), Type 90N.

212-1.6.2 Moisture Barrier. Moisture barrier shall be single width sheet flexible PVC or PE membrane of 30-mil thickness.

212-1.6.3 Root Control Barrier. (Refer to Section 308-3.2) Root control barrier shall be 24 inches (600mm) wide by 0.080-inches (2mm) thick high impact injection molded or polypropylene sheeting with reinforced double top edge, manufactured for root barrier purposes. Sheeting shall have integrally molded 90-degrees root deflector ribbing and integrally molded joiner strips.

212-2 IRRIGATION SYSTEM MATERIALS

212-2.1 Pipe and Fittings. Modify as follows:
Non-pressure burial lateral lines as specified on the drawings.
Pressurized mainline as specified on the drawings.
All sleeving as specified on the drawings.

All sleeving for exposed pipe shall be Schedule 40 galvanized steel pipe.

Swing joints shall be as detailed on the drawings. Swing joints and all fittings shall be same pipe size as sprinkler body inlet. Pressure pipe risers and fittings as specified on the drawings.

All PVC pipe must bear the following markings:
1. Manufacturer's name
2. Nominal pipe size
3. Schedule or class
4. Pressure rating in P.S.I.
5. NSF (National Sanitation Foundation) approval
6. Date extrusion
7. U.P.C. shield logo (IAPMO approval)

All fittings shall bear the manufacturer's name or trademark, material designation, size, applicable I.P.S. schedule and NSF seal of approval.

212-2.2 Valves and Valve Boxes.
212-2.2.2 Shut-Off Valves (SOV)

Ball valves shall be of a brand, size, and type indicated on the irrigation plans.

Ball valves 1" and larger shall have a one or two-piece body constructed of 600 pounds WOG bronze material conforming to ASTM B-584 alloy 844. Ball valve shall have a vented ball with a blowout proof system. Ball valves shall have a working pressure of not less than 150-psi and shall conform to AWWA standards.

212-2.2.4 Remote Control Valves. Remote control valves shall be normally-closed type so designed that the pilot line and solenoid shall not be energized when the valve is in closed position.

Valves shall automatically close in event of electrical power failure or due to breakage of pilot wire.

Manual override shall provide for manual operation prior to electrical connection. This device shall be installed by the valve manufacturer.

No external tubing connection other than waste line will be allowed.

Remote control valves shall be of the brand, size, and type indicated on the irrigation plans.

The remote-control valve shall be normally closed 24 VAC solenoid actuated globe pattern, spring-loaded diaphragm type. The valve shall be pressure rated up to 200 psi at 150 degrees F.

The valve shall have a 60-pound test fabric reinforced rubber diaphragm assembly with self-cleaning stainless steel screen.

Remote Control Valve: The body and bonnet shall be brass and the valve shall have a stainless steel control/shut-off stem and manual operator.

All remote-control valves shall have a bronze angle type shut-off valve installed as part of the valve assembly immediately upstream of the control valve, if specified.

The valve shall provide for all internal parts to be removable from the top without disturbing the valve installation.

Solenoid shall be corrosion proof and constructed of stainless steel molded in epoxy to form one integral unit, 24-volt AC watt maximum holding milliamp in-rush, current: 0.41 amp (9.i VA, holding current: 023 amp (5.5 VA).

212-2.2.6 Quick Coupling Valves and Assemblies.
Quick coupling valves shall be one or two-piece type of the size as specified on the drawings, 150-psi working pressure. They shall be all brass and so constructed that they automatically close when the coupler is removed. All such valves shall be equipped with locking lids and plastic cover.

Quick coupler key is part of this assembly.

Quick coupler assembly: In accordance with type noted on drawings.
212-2.2.7 Valve Boxes. (Replace with the Following)

Rectangular valve boxes shall be 11.75-inches wide by 17-inches long by 12-inches high constructed of rigid polyolefin, chemically inert plastic with valve box extensions where required. Valve boxes shall have locking plastic covers. Valve boxes and covers color as specified on the drawings. Heat brand box lid with appropriate station number.

Round valve boxes shall be 10 inches diameter by 10.5 inches high.

Identification letters or numbers shall be 2-inches high and heat branded onto the box cover. Identification shall be as indicated on the detail drawings.

Heat branding shall be accomplished using branding irons specifically designed for this purpose. Heat branding shall not weaken or in any way puncture the valve box cover.

Valve box covers shall locking type, secured with a 3/8-inch stainless steel bolt, washer and nut.

Rectangular valve boxes shall be used for all valves.

Gravel: All gravel used in valve boxes shall be washed crushed gravel. Size as specified on drawings. No pea gravel shall be used.

Landscape Fabric: Landscape fabric for valve box assemblies shall be 5.0-ounce weight woven polypropylene weed barrier. Landscape fabric shall have burst strength of 225 psi, puncture strength of 60 pounds and capable of water flow of 12 gallons per minute per square foot. Place landscape fabric under all valve boxes to minimize soil intrusion into box.

Identification tags with numbers are required on all valves.
Type: Christy Tags (yellow background with black lettering) or approved equal.

212-2.2.8 Remote Master Valve. Add New Section

Remote master valve shall be as specified on drawings. A flow sensor shall be installed as a part of the irrigation system to monitor any unexpected system flows and communicate to the master valve to shut the system off.

212-2.2.9 Check Valves. Add New Section

Swing Check Valve: Swing check valves shall be constructed of bronze and stainless steel internal parts. Swing check valve shall permit water to flow up slope not down.

Spring Check Valve (adjustable): Spring check valves shall be constructed of bronze and stainless steel internal parts. Spring check valve shall be adjustable between 5 to 15 pounds.

212-2.2.10 Sensors. Add New Section
Flow Sensor – as specified on drawings.

Weather Sensor – as specified on drawings.

212-2.3 Backflow Preventer Assembly. Add the following:
Backflow prevention device shall be of the size and type as indicated on the drawings. Use only brass fittings in assembly.

212-3 ELECTRICAL MATERIALS

212-3.1 General. Add the following:
All wiring and pull box details shall conform to drawing details, these Specifications and as follows:
(a) National Electrical Code.
(b) Local Codes and Ordinances.
(c) Recommendations as printed by the respective supplier.
(d) All wiring shall be continuous, soldered and encapsulated in 3M DBY 9053 containers, at connections to remote control valves.

It shall be the Contractor's responsibility to call out any conflict between the above-listed recommendations.

212-3.2 Conduit and Conductors.
212-3.2.1 Conduit. The first paragraph of Subsection 212-3.2.1 of the Standard Specifications is hereby deleted and replaced with the following:

Conduit shall be PVC 1120, Schedule 40 solvent welded pipe.

Conduit shall be a minimum size as shown in the table below:

Conduit Size	Maximum Number of Wires (#14 AWG)
15mm (½")	2
20mm (¾")	4
25mm (1")	6
32mm (1¼")	10
40mm (1½")	14
50mm (2")	25

212-3.2.2 Conductors. The second paragraph of Subsection 212-3.2.2 of the Standard Specifications is hereby deleted and replaced with the following:

LOW VOLTAGE CONDUCTORS
Pilot lines and common wire connecting remote control valves to automatic controller shall be direct burial, U.F. type with approved 4/64-inch thick waterproof coating, 600 volt, 75 degrees centigrade, copper single-strand wire, U.L. approved.

Common and control wires color and size as specified in drawings.
Flow sensor wires as specified on the drawings.

212-3.3 Controller Units. Automatic controller shall be constructed to operate 24-volt electric normally closed type remote control valves.

Controller shall operate the number of valves shown on the drawings at one valve per station. Controller shall be as shown on drawings.

212-5 STABILIZERS – ADD THIS SECTION

212-5.1 Stabilizing Rods.

All assemblies requiring stabilization shall be equipped with #4x 30" rebar stabilizer rods.

Quantity of stabilizing rods shall be as indicated on the detail drawings.

212-5.2 Vandal-Proof Clamps.

All assemblies requiring stabilization shall be equipped with vandal–proof clamps constructed of stainless steel and be installed with a tool specifically for this purpose. Clamps shall be one time only use type and not be removable with screwdrivers or wrenches. Quantity of clamps shall be as indicated on the detail drawings.

SECTION 215 Traffic Signing

TRAFFIC SIGNING WITHIN THE CITY RIGHT-OF-WAY

All work shall conform to detail drawings as shown on the PLANS and as specified in Section 82 of the State of California Department of Transportation (Caltrans) Standard Specifications, 2018 Revised Edition, and these Special provisions.

All signs shall be standard size and color as specified in the California MUTCD, latest edition, unless otherwise specified by the City.

All new signs to be installed shall be the international symbol (if available) unless otherwise specified.

All signs shall be aluminum panel not less than 5/64 inch thick, 6061-T6 or 5052-H38 Alloys, exceptions are Type L, K and street name signs which shall be 1/16 inch thick, radius corners 3/8 inch. Aluminum base metal shall be cleaned, deoxidized, and coated with a light tightly adherent chromated conversion coating free of any powdery residue.

All sign facings shall be manufactured of high intensity grade, encapsulated lens sheeting, (Hi-Intensity or equal) except for R26 signs which shall be Engineering Grade material (enclosed lens). All signs which could result in a moving violation shall be high intensity. All signs provided under this CONTRACT shall include an anti-graffiti film overlay. Protective overlay shall be 3M Series 1160A overlay or approved equivalent. The anti-graffiti overlay shall be considered as included in the price bid for the item of work and no additional payment will be made therefore.

The date of installation of a sign is to be embossed on the back of the sign and shall be considered as the start of the warranty period. "Property of City of Anaheim" shall also be embossed on the back of the sign.

Sign locations and height shall be according to City of Anaheim Standard 426-C or as directed by the City. All signs are to be 7 feet above the ground measured to the bottom of the lowest sign. Exceptions may be made for bus stop signs, small R26 sign, or bike arrows down to 6 feet when mounted below another sign not installed within the sidewalk. All median mounted signs shall be 4 feet above the ground measured to the bottom of the sign except for:

a) Type K markers to be 1 foot above the ground to the bottom of the sign or 17 – 18 inches above the ground when mounted on Eze-Erect break away posts.

b) All type "N" markers for barricades shall be 2 feet above the ground to the bottom of the sign.

All stop signs (R1-1) and street name signs shall be mounted on 2 ½" x 12' round galvanized posts. Large signs or sign combinations shall use 2" x 15'round galvanized posts. Signs will be mounted with bolt extended through the post. Anchors will be placed at the base of the post to restrict rotation.

No signs will be allowed on traffic signal poles except the following:

Poles – R26, R4-7, R6-2, R3-3, R3-7, R3-4, R10-7, R10-11, W12-1 and Type "N-1" markers.

Mast arms – R61 Series, R54, R73 Series, and R3-4.

All signs placed within the public right-of-way shall be installed using the following guidelines:

a. Signs will be installed on marblelite or steel street light poles wherever possible. No signs shall be placed on wood poles at any time.

b. Larger (wide) signs will always be mounted on the top of a sign combination.

No sign shall have an outside edge closer than 2 feet to the back of curb while maintaining a 3 foot clear sidewalk. For sidewalk less than 7 feet wide and adjacent to curb, sign post may be mounted behind the sidewalk, except for stop signs. Refer to Anaheim Standard Plan 426-C.

c. Sign panel facings shall be perpendicular to approaching traffic unless otherwise specified by the City.

d. Signs shall be mounted on posts in a good workmanship manner using metal hardware suitable for the type of installation made.

e. Installation materials shall be of stainless, galvanized, or other material that does not rust and is theft proof where available.

f. The minimum distance between signs shall be 50 feet. Exceptions must be approved by the City. Signs shall be kept a minimum distance of 6 feet in front of trees, power poles, etc. and a minimum distance of 50 feet beyond them. Signs will be kept far enough away from trees so growth will not obstruct visibility of the sign.

g. R26 and other signs are typically not mounted closer than 150 feet apart.

h. No sign shall be placed on the same post with a stop sign (R1-1) except the 2-way or 4-way supplemental plates. The supplemental plates will not overlap on the stop sign and will be attached with separate bolts.

No signs will overlap and must be installed with separate bolts. "Begin/End" or "Tow-Away" plates are an exception.

Post materials shall consist of the following: 6', 8', or 11' U-channel posts, 6' guide posts, Eze-Erect sign post (break-away), 2" to 4" carriage bolts, 4 - 5/16" x ½" through 1" hex bolts, 5/16" nuts, 5/16" x ¾" and 1" anti-theft bolts and anti-theft nuts, P.C. 2.5 aluminum sign caps, P.C. 1 aluminum sign saddles, 5/8" x 20 ½" carriage bolts, 5/8" nuts, 2" and 2 ½" clamp on U-bracket, Gerrard bracket, ¾" 201 stainless steel buckles, ¾", 030, 201 stainless steel banding, side arm bracket - heavy duty channel iron, galvanized sign braces, galvanized 3/16" x 1" x 30". 5/16" x 1" fiber or nylon washers behind a 5/16" x 1" or 1 ¼" metal washer shall be used on the face of all high-intensity signs.

All posts installed on median in asphalt or concrete shall have break-away braces.

For installation of signs that are 36 inches or larger and/or sign combinations, a brace is used for strength (3/16" x 1" x 30" or 36" brace).

Median noses shall be treated as follows:

a. All median noses shall be painted with yellow reflective traffic paint BCR to ECR, and R4-7 sign and type N-1 Marker,

b. All median signs shall be mounted 5 feet behind the median nose. All core drill holes must be large enough for post anchors to fit. All core drill holes must be patched around the sign post with concrete after installation.

It shall be contractor's responsibility to perform field review and take inventory of traffic control devices such as striping, markings, and traffic signal loops on all streets prior to start of cold milling. The contractor shall replace striping, markings and loops per the City of Anaheim standard details.

PART 3 CONSTRUCTION METHODS

SECTION 300 EARTHWORK

300-1 Clearing and Grubbing
300-1.1 General

CLEARING AND GRUBBING shall include but not be limited to the following:

All items requiring removal for the project to proceed as designed unless otherwise listed separately in these Special Provisions or as directed by the ENGINEER.

Remove all items designated as "To Be Relocated" and "Remove". Areas to be cleared shall be grubbed to a depth necessary to remove all stumps, roots, buried logs, and all other objectionable material.

All obstructions within project limits that are not inclusive of other various items of work shall be removed to a minimum of 12-inches below subgrade.

All equipment and facilities shown on the Plans to be salvaged, removed and stockpiled, adjusted, and/or relocated shall be measured, marked, and identified in the field.

Contractor shall note the locations, dimensions, and configurations of all existing equipment to be salvaged, and shall clearly mark or tag all equipment to be reused in the field prior to removal to facilitate reassembly; Contractor shall notify Engineer of any damaged or non-salvageable materials prior to commencing any removal or grading operations. Materials found to be damaged after the work commences shall be assumed to be the responsibility of the Contractor. Contractor will not be paid for the replacement or repair of facilities or equipment believed by the Engineer to be damaged after the work commences.

300-1.2 Preservation of Property. *Add the following Subsection:*

300-1.2.1 Repair of Parkway Improvements.

(a) Lawn. The CONTRACTOR shall re-sod in accordance with 308-4.8.3 areas where lawn is removed for construction. Thickness and type of sod shall match removed lawn.

(b) Private Sprinklers and Improvements. The CONTRACTOR shall coordinate Work with adjacent property owners. The CONTRACTOR shall test and document the condition of existing improvements before beginning required removals or excavation. The CONTRACTOR shall restore private improvements to documented conditions after completing adjacent Work.

300-1.3 Removal and Disposal of Materials.
300-1.3.1 General. *Delete Subsection in total and substitute with the following:*
No burning will be permitted.

No accumulation of flammable material shall remain on or adjacent to the right-of-way. The roadway and adjacent areas shall be left with a neat and finished appearance.

In order to protect the public streets from deterioration due to hauling of materials, the CONTRACTOR shall submit to the City, prior to the pre-job meeting, for review and approval a proposed route for hauling of materials for disposal. Upon approval, the CONTRACTOR shall strictly adhere to that route, unless written permission from the City is obtained to change the route.

The CONTRACTOR shall use access and haul routes to dispose of excavated material as directed by the Engineer. The CONTRACTOR shall obey all City, County and State traffic ordinances regarding the operation of haul trucks and the carrying of excavated material. The CONTRACTOR shall provide the Engineer with a plan showing the haul routes for the project prior to start of any work, which shall be reviewed and approved by the City.

Items to be removed as shown on the Plans shall be removed and disposed of in an approved disposal site.

SECTION 302 Roadway Surfacing

302-1 Cold Milling of Existing Pavement
302-1.1 General
Add the following:
The CONTRACTOR shall protect all existing facilities during the planning operation and repair or replace any damaged facilities. These existing facilities shall include but not be limited to:
A. Concrete curbs, gutters, driveways and sidewalks.
B. Roadside signs.
C. Trees and shrubs adjacent to the Work area.
D. Utility lines, vaults, manholes, valves and signal detector loops.

Add the following subsection:
302-1.1.1 Temporary Traffic Striping Required After Cold Milling.

Whenever Cold Milling of the existing pavement results in the obliteration of traffic striping, lane lines, crosswalks, legends or other permanent traffic control installations, the contractor shall be required to provide temporary traffic striping following cold milling operations.

Temporary traffic striping shall be painted and shall delineate all traffic lane lines, turn pocket lanes, traffic arrows, center-lines, crosswalks and all other traffic control installations necessary to provide a safe travelling environment for the general public during the course of construction.

All temporary striping required after cold milling operations shall be painted and shall be installed per City Standards within the same work day as cold milling operations. The pavement shall be swept clean and shall be free of cold milling debris prior to installation and painting of temporary traffic striping.

All required temporary traffic striping shall be considered paid for under the cold milling bid item for which it is required and no additional compensation will be allowed.

302-5 Asphalt Concrete Pavement
302-5.1 General

Add the following: (APPLICABLE WITHIN CITY RIGHT OF WAY)

Asphalt concrete within the City right-of-way shall be **Type III-B3-PG 64-10 for Base Course and Type III-B3-PG 64-10 for surface course** conforming to Section 203-6 and Section 400-4 of the SSPWC (Standard Specifications for Public Works Construction, 2012 Edition and any supplement therein) and as requested by the City Inspector. **Surface course shall not consist of reclaimed asphalt pavement (RAP).**

Add the following Subsection:
302-5.1.1 Preparation for Resurfacing.
The CONTRACTOR shall remove existing pavement markers flush with the existing pavement before constructing asphalt concrete pavement.

The CONTRACTOR shall remove asphalt upheaval at cracks in areas scheduled to be resurfaced and not removed by cold milling using crack planing or other approved methods, leaving the upheaval areas flush with adjacent pavement.

The CONTRACTOR shall clean and fill cracks or holes 1/4 inch or wider with liquid asphalt, cold mix, hot mix or as directed by the Engineer. The CONTRACTOR shall clean vegetation only from cracks smaller than 1/4 inch wide.

Add the following Subsection:
302-5.1.2 Measurement and Payment for Crack Preparation.
If no specific item for crack preparation is shown in the Bid, payment for crack preparation will be included in the various other items of Work, and no separate payment shall be made for that effort.

302-5.5 Distribution and Spreading.
Add the following:

Fog Seal Coat

A fog seal coat shall be applied over all join strips where asphalt constructed under this project abuts existing pavement and as directed by the Engineer. The fog seal coat shall conform to the provisions of Section 203.

Fog seal coat shall be an SS1 type asphaltic emulsion applied at a rate of 0.05 gallons per square yard (0.25 L/m2) or as determined by the Engineer. Payment for the fog seal coat shall be included in the unit price bid per ton for “Asphalt Concrete” and shall include full compensation for furnishing all labor, materials, tools, equipment and appurtenances necessary to do the work, complete in place, as shown on the plans, and as specified in the Specifications and Technical

Specifications and as directed by the Engineer. No additional compensation will be allowed therefore.

302-5.8 Manholes (and other structures)
Insert the following after the last paragraph:

For work that involves construction, modifying, or adjusting sewer and storm drain manholes, the Contractor will be required to install a temporary cover over the bottom of the manhole to prevent debris from entering into the mainline and stopping flows.

The Contractor shall adjust all manholes, pull boxes, and valve covers to grade within the project limits of construction. The Engineer has identified existing facilities to be adjusted, which are designated on the plans. It shall be the Contractor's responsibility to identify, coordinate, and adjust all manholes, water valve covers, utility pull boxes, and vaults as shown on the plans or directed by the Engineer.

Sewer and storm drain structures, water valve boxes, survey monuments and electrical vaults extending above the new subgrade, profile surface or cold mill surface shall be removed by the CONTRACTOR to the new subgrade, profile surface or cold mill surface before placement of base material or paving. The owners shall lower other structures. All debris and foreign material shall be removed per Section 301-1.6. The top of reset manholes and other structures shall meet the smoothness requirement as specified in Section 302-5.6.2.

SECTION 303 Concrete and Masonry Construction
303-5 Concrete Curbs, Curbs and Gutters, Walks, Gutters, Cross Gutters, Access Ramps and Driveways.

Add the following Subsection:
303-5.1.4 Parkway Grading.
After constructing curb and parkway improvements, the CONTRACTOR shall place backfill, then blade and bring parkway areas to an even surface. For backfill, the CONTRACTOR shall use select materials from excavation areas within the Work.

303-5.5 Finishing.
303-5.5.2 Curb. *The last sentence of the second paragraph of this section shall be modified as follows:*
The name of CONTRACTOR and the year in which the improvement is constructed shall not be stamped in the completed work.

303-5.5.4 Curb and Gutter
Add the following:
This item shall be constructed in accordance with City of Anaheim Standard Plans 120, as shown on the plan and delineated in these Special Provisions.

All concrete flow lines shall be water-tested upon completion of finishing, and any irregularities causing water ponding shall be corrected and refinished.

Payment for temporary pavement reconstruction adjacent to the curb and gutter and cross gutter shall be included in the various items of work and no additional payment will be allowed.

303-6 Stamped Concrete

The concrete shall have a minimum compressive strength of 3250 psi. Portland cement shall conform to ASTM C 150, Type I, 11, or V. Aggregates shall conform to ASTM C33 and shall be minus 3/8". Mixing water shall be fresh, clean and potable. An air entraining agent conforming to ASTM C260 and/or a normal or retarded-set water reducing admixture conforming to ASTM C494 may be used. No admixture containing calcium chloride shall be permitted in the mix.

303-6.1 General
Add following:

P.C.C. stamped concrete shall be constructed per City of Anaheim Standard 143, or, where necessary, to match existing pattern and color of existing stamped concrete, or as directed by the City PW Inspector. Submittal shall be approved by the City PW Inspector.

Payment for removal and reconstruction of Asphalt Concrete and/or PCC Stamped Concrete (within raised median), including sawcutting (as required), excavation, grading, removal and disposal of existing improvements, preparation of sub grade, including compaction shall be made at the contract unit price bid per Square Foot (SF). No additional compensation shall be allowed therefor.

303-6.3 Placement
Add the following:

Pattern concrete shall be placed FULL WIDTH, excluding walkways, of median islands, per City of Anaheim “Median Island” Standard 143.

303-6.3 Pattern
Add following:
Pattern shall be **Basketweave, Non-Resort**, per City of Anaheim “Median Island” Standard 143 and oriented as shown on construction plans.

303-7 Colored Concrete
Add the following:
Color shall be **Cresenda Brown** per City of Anaheim “ Median Island” Standard 143.

SECTION 306 Underground Conduit Construction

306-1.1.1 General.
Delete the last sentence of the third paragraph and substitute the following:
Removal of ground water shall be performed to a level sufficiently below the structure subgrade to ensure a firm and stable subgrade for the construction of structures. All costs for such dewatering shall be included in the prices bid for the various items of work except as may be otherwise specified in the General Specifications.

306-1.3.6 Compaction Requirements.
Replace with the following:

All trench backfill shall be densified to 90% minimum relative compaction within 12" of the top of subgrade. The top 12" of subgrade shall be densified to 95% minimum relative compaction. Jetting will not be permitted unless specifically approved in advance by the Engineer.

306-1.5 Trench Resurfacing

Trench Replacement shall be per City Standard 132 and as directed by the City PW Inspector.

306-1.5.1 Temporary Resurfacing. The first sentence of the last paragraph is amended as follows:

Payment for temporary trench resurfacing shall be included in the various items of Work, and no additional payment will be allowed.

306-1.5.2 Permanent Resurfacing.
Add the following:

All testing of underground installation at any given point shall be completed before the surface course is placed at that point.

With the exception of the final surface course of asphalt concrete, which shall be included in the quantity bid for "Asphalt Concrete", payment for the asphalt concrete base course used for permanent trench resurfacing shall be included in the various applicable items of Work, and no additional compensation will be allowed therefor.

306-1.6 Basis of Payment for Open Trench Installations
The second paragraph is amended to include the temporary resurfacing, include the removal of asphalt and base material, and include shoring, bracing, dewatering (if required), bedding, and appurtenances necessary for the pipe and conduit installation not identified as a bid item.

The third paragraph is amended to include the temporary resurfacing and include the removal of asphalt and base material.

Add the following Section:
306-9 Utilities
Relocation of Utilities shall be in accordance with Section 5-4, Relocation, of the Standard Specifications.

Minor Utility Relocations and Adjustments shall include the following: traffic signal pull boxes and street light pull boxes.

Add the following Subsection:
306-9.1 Measurement and Payment

Minor Utility Relocations not covered by individual bid items, shall be included in the various items of work and no further compensation will be allowed.

SECTION 308 — Landscape and Irrigation Installation
308-1 GENERAL
Add the following:

All existing lawn and landscape areas disturbed by the Contractor as part of or as a result of the work shall be prepared and re-sodded and/or replanted in kind, except as otherwise designated in the Plans. Existing irrigation systems shall be repaired and restored to operating condition to the satisfaction of the Engineer.

The contractor shall inspect the landscape areas prior to commencing any work in this section and confirm that all object material including but not limited to concrete and asphalt paving debris, other new or existing construction debris, other equipment, abandoned wet or dry utilities, negative debris, etc. have been removed to the depth indicated in Section 300-1 clearing and grubbing.

All equipment and facilities shown on the plans to be salvaged, removed and stockpiled, adjusted, and/or relocated shall be measured, marked, and identified in the field and photographed and recorded via video.

Contractor shall note the locations, dimensions, and configurations of all existing equipment to be salvaged, and shall clearly mark or tag all equipment to be reused in the field prior to removal to facilitate reassembly; Contractor shall notify Engineer of any damaged or non-salvageable materials **prior** to commencing any removal or grading operations. Materials found to be damaged after the work commences shall be assumed to be the responsibility of the Contractor. Contractor will not be paid for the replacement or repair of facilities or equipment believed by the Engineer to be damaged after the work commences.

308-2 EARTHWORK AND TOPSOIL PLACEMENT.
308-2.3 Topsoil Preparation and Conditioning.
308-2.3.1 General.
Replace “12 inches (300 mm)” with “36 inches (914 mm)” second sentence of first paragraph.

Add the following at the end of the section:

After topsoil preparation, irrigate and fertilize all planting areas for 14 calendar days to achieve weed germination.

If live weeds exist on site after irrigating and at the beginning of work, spray with a nonselective systemic contact herbicide, as recommended and applied by an approved licensed landscape pest control advisor and applicator. Leave sprayed plants intact for fifteen (15) days to allow systemic kill. All herbicide types and application must first be approved, in writing, by the Engineer.

Clear and remove all weeds by grubbing off all plant parts at least ¼ inch below the surface of the soil to be planted.

Repeat process as necessary or as directed by the City PW Inspector.

Do not plant until herbicide manufacturer indicates planting will not be affected by herbicide residue.

Maintain site in a weed-free condition at all times. Degree of acceptability shall be solely determined by the City PW Inspector.

308-2.4 Finish Grading**.**
First sentence, revise to read as follows:
Contours and finish grade shall provide for drainage to sheet and shall not channel drainage in a manner where volume and velocity of water will create surface erosion. The CONTRACTOR shall immediately repair any surface erosion at no cost to the City.

308-3 HEADER INSTALLATION.
Replace second paragraph with the following:

Stakes shall be located at splices, corners, and at intervals not to exceed 4 feet and driven 1 inch below the top of the header. Splice plates shall be used at butt joints. Headers shall be fixed firmly to stakes with two screws, clinched ½ inch. Splice plates shall be centered on the joint and secured with two 1.5 inch long bolts with washer, 4 sets at each splice.

308-4 PLANTING
Add the following:
The Contractor is responsible to schedule tree deliveries. Daily deliveries shall not exceed the Contractor's capability to place delivered trees on site unless the Contractor has provided adequate off-site storage space. All charges for extra handling shall be borne by the Contractor.

The Contractor shall provide off-loading and placing equipment of adequate capacity to safely handle the furnished trees.

308-4.1 General.
Add the following:

Planting methods shall be as indicated in the SSPWC and in the drawings. In the event of a conflict the drawings shall prevail.

308-4.5 Tree and Shrub Planting.
All trees shall be planted per Standard Detail Nos. 518 and 520.
All shrubs shall be planted per Standard Detail 528.

Add New Section:
308-4.10 Watering
It shall be Contractor's responsibility to maintain a balanced watering program to ensure proper growth until final acceptance of the work.

Immediately after planting, apply water to each plant. Apply water in a moderate stream in the planting hole until the material around the roots is completely saturated from the bottom of the hole to the top of the ground.

Add New Section:
308-4.11 Mulch
Following acceptance of plant material installation, apply even layer of mulch over all areas shown as planting areas on the Plans, except lawn. Taper thickness of mulch to meet pavement 15mm (½") minimum below the finished surface of pavement. Do not mulch over the tree or shrub container rootball surface.

All mulch shall be installed with a weed barrier fabric below. Weed barrier fabric shall be placed loosely with longitudinal and transverse joints overlapping 8-inches. After placement, all fabric shall lay flat, smooth, and be in contact with the soil surface without wrinkles. The fabric shall be stapled/staked in place to keep the fabric in place during the mulch placement. The weed barrier fabric shall be manufactured from thermally spun bonded polypropylene fabric and shall be DeWitt Weed-Barrier PRO or approved equal.

308-5 IRRIGATION SYSTEM INSTALLATION
308-5.1 General.
Add the following:

All abandoned domestic irrigation lines must be cut and capped at the mainline. The remaining portions of the existing system are to be maintained and operational during construction.

Due to the scale of the Plans, it is not possible to indicate all offsets, fittings, sleeves, etc., which may be required. The CONTRACTOR shall carefully investigate the structural and finished conditions affecting its work and plan the Work accordingly, furnishing such fittings, etc., as may be required to meet such conditions.

The Work shall be installed to avoid conflicts between planting and architectural features, etc.

All Work called for in the Plans by notes or details shall be furnished and installed whether or not specifically mentioned in the Specifications.

The CONTRACTOR shall not willfully install the irrigation system as shown on the drawings when it is obvious in the field that the POC information as shown on the Plans is different than actual information gathered in the field. Also, the CONTRACTOR shall not willfully install the irrigation system as shown on the drawings when it is obvious in the field that unknown obstructions, grade differences, or discrepancies in area dimensions exist that might not have been considered in engineering. Such obstructions or differences shall be brought to the attention of the Engineer. In the event this notification is not performed, the CONTRACTOR shall assume full responsibility for any revisions necessary and shall perform such at its own expense.

308-5.2 Irrigation Pipeline Installation.
308-5.2.1 General.
Add the following paragraph:
A minimum of 12 inches clearance shall be maintained between irrigation pipelines and non-irrigation pipelines/conduits.

Add the following paragraph:

PVC Sleeves shall be required under areas where all hardscape materials shall be installed. Sleeving shall be done per details on the Plans, City of Anaheim Standards, and these Technical Specifications.

If settlement occurs and subsequent adjustments in pipe, valves, irrigation heads, turf or other plantings, or other construction are necessary, the contractor shall make all required adjustments without cost to the City.

Add New Section
308-5.2.5 Trench Backfill in Roadways and Parking Areas.

a. All trenches for pipeline and electrical conduit under roadways shall be backfilled with a portland cement concrete treated slurry conforming to Subsection 201-1.1.2. Class Use Table for Trench Backfill Slurry. Sand bedding material shall extend at least 6 inches (150mm) above the pipe or conduit.
b. Paving for trench cover shall meet the pavement requirements for this project and shall be at least the thickness of adjacent undisturbed paving plus 1-inch (25mm), thoroughly compacted in place, and finished to a neat continuous surface.
c. Under public roads, all mainlines and lateral piping must be in sleeves and have a minimum cover of 36-inches.

Sleeves shall be two (2) times the diameter of lateral line, mainline, and wire bundle size, and a minimum of one-inch (1) size. Install sleeves for each use.

308-5.3 Installation of Valves, Valve Boxes, and Special Equipment.
Add the following:
Pull boxes for control wires that are set in pavement shall be flush with the finish surface.
All valve boxes and pull boxes shall be installed parallel to adjacent hardscape.

308-5.4.2 Location, Elevation, and Spacing.
Revise the third paragraph with the following:
Unless otherwise specified on the Plans, fixed riser shrub heads and bubbler heads shall be installed 6 inches (150 mm) above finish grade. Pop-up heads shall be installed ½ inch (12.5 mm) above finish grade.

308-5.4.4 Sprinkler Head Adjustment.
Add the following:
Sprinkler heads shall be adjusted to eliminate overspray onto adjacent paving or other non-planted areas.

308-5.5 Automatic Control System Installation.
Add the following:
The Automatic Irrigation Controller Assembly shall include the following:

Automatic Irrigation Controller
Weather sensor, sensor wires and relays
Flow sensor, valve box, flow sensor wires and relays
Radio transmitter/receiver controller module
Radio transmitter/receiver hand-held unit
Master valve module and relay
Pressure switch module and relay
Radio Antenna

Supplemental irrigation control systems equipment shall include furnishing and installing the specified equipment in conformance with the manufacturers written instructions and specifications, including communications equipment, sensors, wire, valve boxes, special connectors, terminal boards, and any other equipment required to provide a complete operating system.

308-5.6 Flushing and Testing.
308-5.6.1 General.
Add the following:

When the irrigation system is completed, a coverage test shall be performed in the presence of the Engineer to determine if the water coverage for planting areas is complete, adequate, and avoids overspray onto walks, roadways, and buildings as much as possible. The CONTRACTOR shall furnish all materials and perform all work required to correct any inadequacies of coverage due to deviations from the Plans, or where the system has been willfully installed as indicated on the Plans when it is obviously inadequate, without bringing this to the attention of the Engineer. This test shall be accomplished before any ground cover is planted.

The CONTRACTOR shall request the presence of the City in writing at least 48 hours in advance of testing. The CONTRACTOR shall flush and adjust all sprinkler heads for optimum performance and to prevent overspray onto walks, roadways, and buildings as much as possible.

SECTION 309- Monuments
Add the following:

Prior to construction, all survey monuments that may be disturbed shall be tied out and a corner record of each monument shall be submitted to the City Surveyor for approval, prior to being filed with the County Surveyor. Following construction, all survey monuments that were disturbed shall be reset in their original positions and a corner record of each monument shall be submitted to the City Surveyor for approval, prior to being filed with the County Surveyor pursuant to the Professional Land Surveyor's Act Section 8771(d).

SECTION 314 Traffic Striping, Curb and Pavement Markings, and Pavement Markers

314-4.3 Painted Traffic Striping and Curb and Pavement Markers

314-4.3.1 General

Insert the following at the end of this section:

All traffic lines shall conform to the State of California Department of Transportation (Caltrans) Standard Plans and Standard Specifications, 2018 Revised Edition and these Special Provisions.

The following Details of the Standard Plans shall be routinely used for traffic lines:

Line	Anaheim Detail	Caltrans Detail	Pavement Marker Information
Yellow skip or Solid	450 & 460	2 and/or 4	Type AY & D
Double Yellow CL	453 & 458	22 and/or 23	Type AY & D
White Skip	451 & 459	10 with 4 Type "A" Markers	Type A & G & C
Two-Way Left-Turn Lane	454	32 and/or 33	Type AY & D
Channelizing Stripe	455	38 and/or 38C	Type A & G & C
Trap Lane Stripe		37B	Type A & G & C
Median Islands	456		Type D

Detail 9 (painted skip strip) will be allowed in certain instances when it is not advisable to emplace a long-life line due to line locations, pavement conditions, or special circumstances. This determination will be made by the City and the ENGINEER.

All crosswalks, turn arrows, stop and yield bars and messages, and all other pavement legends, with the exception of "Bike Lane" and continental crosswalks (per Standard Detail 477), shall be installed in thermoplastic on arterial streets. They shall be painted on minor streets and intersections unless specified thermoplastic on PLANS or work orders. Continental crosswalks shall be applied in 2 coats of paint with second coat applied 3 days after application of the first coat.

Long life pavement marking legends must be thermoplastic.

Bike lane stripes and messages shall be painted. The stripe may be 6 inches wide solid white with 100 feet of skip at intersections or major driveways.

The first 3 raised pavement markers for any white line at an intersection shall be Type C for the opposite direction of travel. See Anaheim Standard Detail No. 459.

CONTRACTOR shall install traffic striping, marking, arrows and messages pursuant to the PLANS where provided. All work and materials shall conform to the requirements of the State of California, Standard Specifications, 2018 Revised Edition, and the latest edition of the State of California MUTCD. Payment shall be per this specification.

CONTRACTOR shall furnish and install traffic delineation using paint "Cat tracking", temporary marking tape, or other approved media on the same working day as existing stripes are lost, including bicycle lanes, in locations consistent with the striping PLANS. If temporary marking tape is used, all tape shall be removed prior to installation of permanent striping.

CONTRACTOR shall apply paint prior to installing raised pavement markers. Raised pavement markers shall be placed on the newly painted line. When raised pavement markers are not used, two (2) coats of paint shall be used.

CONTRACTOR shall furnish and install raised pavement markings no sooner than seven (7) calendar days and no later than fifteen (15) calendar days after traffic striping is installed pursuant to the striping PLANS. When two (2) coats of paint are specified on the PLANS, the second coat shall be applied no sooner than seven (7) calendar days and no later than fifteen (15) calendar days after new pavement surface is placed.

CONTRACTOR shall remove all existing raised pavement markers before any pavement overlay or slurry seal is placed on the street.

314-4.3.5 Application (Stop Legends and Bars)

Add the following:

The stop legends and bars at all adjoining intersections shall be repainted or replaced in accordance with City Standard 435.

PART 4: SECTION 400 – ALTERNATE ROCK PRODUCTS, ASPHALT CONCRETE, PORTLAND CEMENT CONCRETE AND UNTREATED BASE MATERIAL

Section 400-4 - ASPHALT CONCRETE

Asphalt concrete shall conform to the provisions of Section 400-4 of the Standard Specifications for Public Works Construction, 2012 Edition and the following supplement:

Coarse aggregate shall consist of material of which at least 75% by weight shall be crushed particles in lieu of the requirements of Section 400-4.2.3.

The gradation of combined aggregate and the asphalt content shall be as follows:

Arterial Highways, Collector, and Interior Streets	Max
19 mm (3/4") (III-B3-PG 64-10) Base Course	5.7%
13 mm (1/2") (III-C3-PG 64-10) Base and Surface Course	6.0%

Surface course shall not consist of reclaimed asphalt pavement (RAP).

Base course shall be per SSPWC, 2012 Edition and any supplement therein.

Performance Graded (PG) asphalt binder shall conform with Section 92 of the State of California, Department of Transportation Standard Specifications (2010 Edition and subsequent supplements).

Anaheim Canyon Station Project

The Anaheim Canyon station is served by Metrolink 's Inland Empire to Orange County (IEOC) line. The proposed improvements are designed to increase capacity at the station, as well as improve reliability, on-time performance, and safety at the station. Improvements include addition of a second track through the station and related rail crossing improvements to the second track, the addition of a second platform on the new track, extending the existing platform and the addition of shade structures, benches, and ticket vending machines. These improvements will provide benefits for Metrolink passengers by enhancing pedestrian accessibility and decreasing train delay times.

SECTION IX: LIST OF DRAWINGS - EXHIBIT C

LIST OF DRAWINGS

By this reference, the following drawings are incorporated in this Invitation for Bids.

Sheet Identification	Number of Sheets
Architectural, Structural, Electrical, Plumbing and Landscaping Plans	72
Civil, Utilities and Grade Crossings Plans	70
Track Plans	33
Drainage Report-FINAL	101
Geotechnical Report	142
Draft Stormwater Pollution Prevention Plan (SWPPP)	151
Water Quality Management Plan with Attachments (WQMP)-FINAL	221
Design Calculation for Canopy and Light Pole	23
Design Calculation for Retaining Wall	24

BID BOOKLET INVITATION FOR BID (IFB) 0-2193
BOOK 2 OF 2

CONSTRUCTION OF ANAHEIM CANYON METROLINK STATION IMPROVEMENTS

ORANGE COUNTY TRANSPORTATION AUTHORITY
550 South Main Street
P.O. Box 14184
Orange, CA 92863-1584
(714) 560-6282

Key IFB Dates

Issue Date:	**October 12, 2020**
Pre-Bid Conference/Site Visit:	**October 19, 2020**
Questions/Approved Equal Submittal:	**November 4, 2020**
Bids Submittal Date:	**December 9, 2020**

FEDERAL TRANSIT ADMINISTRATION FUNDED PROJECT

BID DOCUMENT SUBMISSION CHECKLIST

IFB NO. 0-2193

PROJECT TITLE: Construction of Anaheim Canyon Metrolink Station Improvements

The Orange County Transportation Authority has prepared this checklist as a reminder of the documents required to be submitted with the bid. These documents must be complete, fully executed, notarized where appropriate as required in the bid documents in order to render the bid responsive.

THE FOLLOWING CHECKED DOCUMENTS MUST BE SUBMITTED WITH THE BID:
General IFB Forms:

	Bid Form – include all pages 1 through 4. *All addenda must be acknowledged, signed, dated, corporate seal*
	Bid Security Form: Bid Bond or Check (circle one) *Correct bid number, signed, dated, notarized (bid bond)*
	Information Required of Bidder *Provide all information, signed*
	Bidders Certificate of Compliance Regarding Workers Compensation Insurance *Signed and dated*
	Bidders Certificate of Compliance Regarding State of California Business and Professions Code Section 7028.15 *Signed, dated, notarized*
	List of Subcontractors (Exhibit D) *License Number- address/ name should match that associated with License # on CSLB website, DIR Registration Number, Description of work (one subcontractor for each portion), Dollar amount and Bidders name at bottom of form*
	Status of Past and Present Contracts Form *Signed, dated*
	Non-Collusion Declaration Form *Signed, dated*
	Iran Contracting Act Certification Applicable (Bids over $1,000,000 only) *Signed, dated, (select one option only)*

Federal Forms:

	DBE Participation Commitment Form *Information required for all DBE subcontractors (no minimum dollar threshold), signed, dated*
	DBE Commitment Letters for each DBE Listed on the Participation Commitment Form *Acknowledgement of scope of work and dollar value, signed and dated*
	Bidders Certificate Regarding "Buy America" Requirements (bids over $150,000 only) *Signed, dated. (Select one option only)*
	Certification of Restrictions on Lobbying (bids over $100,000) *Signed, dated*
	Disclosure of Lobbying Activities *Check box at top of the form if no reportable activities and complete Section 16 (signature, date, name, title and telephone number)*
	Disclosure of Lobbying Activities Continuation Sheet *Use if additional space is required to complete information*

Signature on this Bid Document Submission Checklist is affirmation that items marked above are hereby submitted with the bid. I understand that failure to complete and/or submit any of the required documents may deem my bid non-responsive.

_____ _____

Authorized Signature Print Name and Title

_____ _____

Firm Name Date

THE FOLLOWING DOCUMENTS ARE PART OF THE BID AND DUE NO LATER THAN 4:00 PM ON THE 2ND BUSINESS DAY AFTER THE BID DUE DATE.

	Bidders List *List all firms, DBE and non-DBE, that bid or were solicited for quotes*
	DBE Information - Good Faith Efforts *Include all information to document and substantiate Good Faith Efforts*

OCTA

BID FORM

The undersigned hereby proposes to perform all work for which a contract may be awarded and to furnish any and all plant, labor, services, material, tools, equipment, supplies, transportation, utilities, and all other items and facilities necessary therefore as required in the **IFB 0-2193**, **"CONSTRUCTION OF ANAHEIM CANYON METROLINK STATION IMPROVEMENTS"**, and to do everything required therein; and further proposes that, if this bid is accepted, will contract in the form and manner stipulated to perform all the work in strict conformity therewith within the time limits set forth therein, and will accept as full payment therefore, the following price:

Description	**Total Lump Sum Bid Amount**
_____	$ _____

A cashier's check/certified check/bid bond (circle applicable term) properly made payable to Orange County Transportation Authority, hereinafter designated as the Owner, for the sum of _____ Dollars ($ _____) which amount is not less than ten percent (10%) of the total amount of this bid, is attached hereto and is given as a guarantee that the undersigned will execute the Agreement and furnish the required bonds, "Guaranty" and "Certificate of Insurance", if awarded the contract, and in case of failure to do so within the time provided, (a) the proceeds of said check shall be forfeited to the Authority; or (b) surety's liability to the Authority for forfeiture of the face amount of the bond shall be considered as established [circle (a) or (b)].

The undersigned hereby represents that:

BID FORM, PAGE 2

1. Bidder has thoroughly examined and become familiar with the work required and documents included under this IFB. The bidder understands that the award of the contract, if it is awarded, will be based on the lowest total bid submitted by a responsive and responsible bidder, and further, that the amounts and the total on the Bid Form will be subject to verification by the Authority.

2. By investigation at the site of the work and otherwise, it is satisfied as to the nature and location of the work and is fully informed as to all conditions and matters, which can in any way affect the work or the cost thereof.

3. Bidder fully understands the scope of the work/specifications and has checked carefully all words and figures inserted in said Invitation For Bids (IFB) and further understands that the Authority will in no way be responsible for any errors or omissions in the preparation of this bid. Bidder further asserts that it is capable of performing quality work to meet Authority's requirements.

4. Bidder will execute the Agreement and furnish the required Performance and Payment Bonds, Guaranty and proof of insurance coverage within ten (10) calendar days after notice of acceptance of bid by the Authority; and further, that this bid may not be withdrawn for a period of 120 calendar days after the date set for the opening thereof, unless otherwise required by law. If any bidder shall withdraw its bid within said period, the bidder shall be liable under the provisions of the Bid Security, or the bidder and the surety shall be liable under the Bid Bond, as the case may be.

5. Bidder hereby certifies that this bid is genuine and not a sham or collusive or made in the interest or on behalf of any person not herein named, and the undersigned has not directly or indirectly induced or solicited any other bidder to put in a sham bid, or any other person, firm, or corporation to refrain from bidding; the undersigned has not in any manner sought by collusion to secure for himself an advantage over any other bidder.

6. In conformance with current statutory requirements of Section 1860, et. seq., of the Labor Code of the State of California, the bidder shall execute the document included in this IFB entitled "Bidder's Certificate of Compliance Regarding Workers' Compensation Insurance."

7. Bidder hereby further certifies that each, and every representations made in this bid are true and correct and made under penalty of perjury.

BID FORM, PAGE 3

8. Bidder shall permit the authorized representative of the Authority to inspect and audit all data and records of bidder relating to this bid, and if awarded a contract resulting from this bid, shall permit such inspection and audit of all data and records of bidder related to bidder's performance of such contract.

9. Bidder does not employ anyone who is now, or for one (1) year immediately prior to the date of this offer was, a director, officer, member, or employee of the Orange County Transportation Authority. The undersigned has not agreed to pay a fee contingent upon the award of a contract resulting from this bid to anyone who is now, or for one (1) year immediately prior to the date of this bid was, a director, officer, member, or employee of the Orange County Transportation Authority. No member of or delegate to the Congress of the United States shall be admitted to any share of the contract or to any benefit arising therefrom.

10. If awarded a contract resulting from this bid, bidder shall not discriminate against any employee or applicant for employment because of race, religion, color, sex, age or national origin. The bidder shall take affirmative action to ensure that applicants are employed, and that employees are treated during their employment, without regard to their race, religion, color, sex, age or national origin. Such actions shall include, but not be limited to the following: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship.

11. If awarded a contract resulting from this bid, bidder will cooperate with the Authority in meeting commitments and goals with regard to the maximum utilization of DBE firms and will use its best efforts to ensure that DBE firms shall have the maximum practicable opportunity to compete for subcontract work under such contract.

12. Bid will be in effect for 120 calendar days after the bid closing date.

BID FORM, PAGE 4

Now: In compliance with the **Invitation For Bids (IFB) 0-2193**, **"CONSTRUCTION OF ANAHEIM CANYON METROLINK STATION IMPROVEMENTS"**, the undersigned, with full cognizance thereof, hereby proposes to perform the entire work in strict compliance with all of the said requirements and provisions for the prices set forth herein upon which award of contract is made. The undersigned affirms that the information provided herein is true and accurate and that any misrepresentations are made under penalty of perjury.

Dated _____ , 2021

The above bid includes

Addenda Nos. _____

Bidder _____

Signature _____

Name _____

Title _____

Bidder's Authorized Representative _____

Title _____

Telephone # _____

Fax # _____

Email Address _____

Bidders post office address _____

_____

_____

Corporation organized under the laws of the State of _____

Contractor's License No. _____

Expiration Date of License _____

Surety or sureties _____

_____

(CORPORATE SEAL)

BID SECURITY FORM
BID BOND

KNOW ALL MEN BY THESE PRESENTS:

That, _____ as principal and Bidder and _____ as Surety, are held and firmly bound unto the Orange County Transportation Authority, of State of California, hereinafter referred to as "Authority," in the sum of _____ Dollars ($_____), to be paid to the Authority, its successors, and assigns; for which payment, well and truly to be made, bind themselves, their heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents, this amount being ten percent (10%) of the total amount of the Bid.

THE CONDITION OF THIS OBLIGATION IS SUCH, that if the certain bid of the above named bounden principal _____ _____ for _____ at the Orange County Transportation Authority's _____ as specifically set forth in documents entitled **IFB 0-2193, "CONSTRUCTION OF ANAHEIM CANYON METROLINK STATION IMPROVEMENTS",** shall not be withdrawn within a period of 120 calendar days after the date set for the opening of bids, (unless otherwise required by law, and notwithstanding the award of the contract to another Bidder), and that if said bid is accepted by the Authority through action of its legally constituted contracting authorities and if the above bounden _____ its heirs, executors, administrators, successors and assigns, shall execute a contract for such construction and deliver the required Performance and Payment Bonds, "Guaranty," and proof of insurance coverage within ten (10) calendar days after notification of contract award from the Authority, then this obligation shall become null and void; otherwise it shall be and remain in full force and effect.

IN WITNESS WHEREOF, we hereunto set our hands and seals this _____ day of _____, 2021.

_____
_____

NOTE: The standard printed bond form of any bonding company acceptable to the Authority may be used in lieu of the foregoing approved sample bond form provided the security stipulations protecting the Authority are not in any way reduced by use of the security company's printed standard form.

BID SECURITY FORM
CHECK TO ACCOMPANY BID

(NOTE: The following form shall be used in case check accompanies bid)

Accompanying this bid is a Certified or Cashiers check (circle the appropriate one) payable to the order of Orange County Transportation Authority, hereinafter referred to as "Authority" for _____ dollars ($_____), this amount being ten percent (10%) of the total amount of the Bid submitted in response to **IFB 0-2193, "CONSTRUCTION OF ANAHEIM CANYON METROLINK STATION IMPROVEMENTS".** The proceeds of this check shall become the property of Authority provided this bid shall be accepted by Authority through action of its legally constituted contracting authorities and the undersigned shall fail to execute a contract and furnish the required Guaranty Form, Performance and Payment Bonds and proof of insurance coverage within ten (10) calendar days after date of notification of contract award from the Authority. The proceeds of this check shall also become the property of the Authority if the undersigned bidder withdraws the bid within the period of 120 days after the date set for the opening thereof, unless otherwise required by law, and notwithstanding the award of the contract to another bidder. Otherwise, the check shall be returned to the undersigned.

Bidder:_____

Signature:_____

Date:_____

NOTE: If the bidder desires to use a bond instead of check, the Bid Bond form shall be executed and the sum of this bond shall be ten percent [10%] of the total amount of the bid.

INFORMATION REQUIRED OF BIDDER

The bidder is required to supply the following information. Additional sheets may be attached if necessary.

1. Name of Bidder: _____
2. Business Address: _____
3. Telephone ( )_____ Fax ( )_____E-Mail: _____
4. Type of Firm - Individual, Partnership or Corporation: _____
5. Corporation organized under the laws of state of: _____
6. Contractor's License No.: _____ Class: _____ Years of Experience:___
7. Expiration Date of License: _____
8. Is your firm a certified small business in California? Yes____ No____
9. List the names and addresses of all owners of the firm or names and titles of all officers of the corporation:

   _____

   _____

INFORMATION REQUIRED OF BIDDER, PAGE 2

10. Please list the following: a) All prior and current license numbers that the current owner(s) or officers possess or have possessed in the last five years and the current status of those license; b) any prior company names that the owner(s) had in operation during the previous five years.

Current Officers or Owners Name	Prior Company Names (During the last 5 years)	Prior and Current License Numbers	Status of License

Note: If additional space is required to detail the information requested, please attach another page. All information requested must be included. Failure to identify all of the information may result in your bid being found non-responsive and your bid being rejected.

11. List all construction projects (public and private) for which Bidder has provided general contractor services for the past three years:

Contract Type (Public or Private)	Project Description	Dates of Service	Total Cost	Name and Address of Owner	Contact Name and Phone Number

Note: If additional space is required to detail the information requested, please attach another page. All information requested must be included. Failure to identify all of the information, may result in your bid being found non-responsive and your bid being rejected.

12. List the name, address and phone number of Superintendent for this project:

_____

13. List all construction projects (public and private) for which Superintendent has provided services as a Superintendent for the past three years.

Contract Type (Public or Private)	Project Description	Dates of Service	Total Cost	Name and Address of Owner	Contact Name and Phone Number

Bidder hereby certifies that it:

_____ is a certified Disadvantaged Business Enterprise as defined herein.

_____ is not a Disadvantaged Business Enterprise as defined herein.

NOTE: If requested by the Authority, bidder shall furnish a certified financial statement, financial data, or other information and references sufficiently comprehensive to permit an appraisal of its current financial condition.

I hereby certify the above is true and correct to the best of my belief.

_____
Signature

_____
Name

_____
Title

_____
Company Name

_____
Telephone Number

_____
Fax Number

_____
Email Address

NOTICE OF REQUIREMENT FOR AFFIRMATIVE ACTION TO ENSURE EQUAL EMPLOYMENT OPPORTUNITY (EXECUTIVE ORDER 11246)

1. The Bidders' attention is called to the "Equal Opportunity Clause" and the "Standard Federal Equal Employment Opportunity Construction Contract Specifications" set forth herein.

2. The goals and timetables for minority and female participation, expressed in percentage terms for the Contractor's aggregate work force in each trade on all construction work in the covered area, are as follows:

   Timetable Goals for Minority Participation for Each Trade (11.9)

   Goals for Female Participation in Each Trade (6.9)

   These goals are applicable to all the Contractor's construction work (whether or not it is federal or federally assisted) performed in the covered area.

   The Contractor's compliance with the Executive Order and the regulations in 41 C.F.R. Part 60-4 shall be based on its implementation of the Equal Opportunity Clause, specific affirmative action obligations required by the specifications set forth in 41 C.F.R. 60-4.3 (a), and its efforts to meet the goals established for the geographical area where the contract resulting from this solicitation is to be performed. The hours of minority and female employment and training must be substantially uniform throughout the length of the contract, and in each trade, and the Contractor shall make a good faith effort to employ minorities and women evenly on each of its projects. The transfer of minority or female employees or trainees from contractor to contractor or from project to project for the sole purpose of meeting the contractor's goals shall be a violation of the contract, the Executive Order and the regulations in 41 C.F.R. Part 60-4. Compliance with the goals will be measured against the total work hours performed.

3. The Contractor shall provide written notification to the Director of the Office of Federal Contract Compliance Programs within ten (10) working days of award of any construction subcontract in excess of $10,000 at any tier for construction work under the contract resulting from this solicitation. The notification shall list the name, address and telephone number of the subcontractor; employer identification number; estimated dollar amount of the subcontract; estimated starting and completion dates of the subcontract; and the geographical area in which the contract is to be performed.

4. As used in this Notice, and in the contract resulting from this solicitation, the "covered area" includes the County of Orange, California.

BIDDER'S CERTIFICATE OF COMPLIANCE REGARDING WORKERS' COMPENSATION INSURANCE

In conformance with current statutory requirements of Section 1860, et. seq., of the Labor Code of the State of California, the undersigned confirms the following certification:

> "I am aware of the provisions of Section 3700 of the Labor Code which require every employer to be insured against liability for Workers' Compensation or to undertake self-insurance in accordance with the provisions of that code and I will comply with such provisions before commencing the performance of the work of this Contract."

Bidder/Contractor: _____

Signature: _____

Name and Title: _____

Date: _____

BIDDER'S CERTIFICATE OF COMPLIANCE
REGARDING
STATE OF CALIFORNIA
BUSINESS AND PROFESSIONS CODE SECTION 7028.15

Contractor License Number: _____

Expiration Date of Contractor's License: _____

Each, every and all of the representations made by Bidder in the attached bid are true and correct.

Name of Bidder/Contractor: _____

Signed: _____

Title: _____

Subscribed to and sworn before me, a Notary Public in and for the State of California, on _____, 2021.

_____
Notary Public

My commission expires on:

_____, 202__.
(NOTARY SEAL)

LIST OF SUBCONTRACTORS (EXHIBIT D)

List only the subcontractors, which will perform work or labor or render services to the bidder in excess of one-half of one percent (1/2 of 1%) of the bidder's total bid amount. Do not list alternative subcontractors for the same work. (Use additional sheets if necessary.)

Name & Address Under Which Subcontractor is Licensed	License Number	DIR Registration No.	Specific Description of Work to be Rendered	Small Business Y/N	Type	Dollar Amount
						$
						$
						$
						$
						$
						$
TOTAL VALUE OF SUBCONTRACTED WORK						$

Bidder's Name _____

STATUS OF PAST AND PRESENT CONTRACTS FORM

On the form provided below, Offeror/Bidder shall list the status of past and present contracts where the firm has either provided services as a prime vendor or a subcontractor during the past five (5) years in which the contract has been the subject of or may be involved in litigation with the contracting authority. This includes, but is not limited to, claims, settlement agreements, arbitrations, administrative proceedings, and investigations arising out of the contract.

A separate form must be completed for each contract. Offeror/Bidder shall provide an accurate contact name and telephone number for each contract and indicate the term of the contract and the original contract value. Offeror/Bidder shall also provide a brief summary and the current status of the litigation, claims, settlement agreements, arbitrations, administrative proceedings, or investigations. If the contract was terminated, list the reason for termination.

Offeror/Bidder shall have an ongoing obligation to update the Authority with any changes to the identified contracts and any new litigation, claims, settlement agreements, arbitrations, administrative proceedings, or investigations that arise subsequent to the submission of the bid. Each form must be signed by an officer of the Offeror/Bidder confirming that the information provided is true and accurate.

Project city/agency/other:
Contact Name: **Phone:**
Project Award Date: **Original Contract Value:**
Term of Contract:
(1) Litigation, claims, settlements, arbitrations, or investigations associated with contract:
(2) Summary and Status of contract:
(3) Summary and Status of action identified in (1):
(4) Reason for termination, if applicable:

By signing this Form entitled "Status of Past and Present Contracts," I am affirming that all of the information provided is true and accurate.

Name _____ Signature _____

Title _____ Date _____

Revised. 03/16/2018

Non-Collusion Declaration to be Executed by Bidder and Submitted with Bid

To the Orange County Transportation Authority
The undersigned declares:

I am the _____ of _____, the party making the foregoing bid. In accordance with Title 23 United States Code Section 112 and Public Contract Code Section, 7106 the bidder declares that the bid is not made in the interest of, or on the behalf of, any undisclosed person, partnership, company, association, organization or corporation. The bid is genuine and not collusive or sham. The bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid, or that anyone shall refrain from bidding. The bidder has not in any manner, directly or indirectly, sought by agreement, communication, or conference with anyone to fix the bid price of the bidder or any other bidder, or to fix any overhead, profit, or cost element of the bid price, or of that of any bidder, or to secure any advantage against the public body awarding the contract of anyone interested in the proposed contract. All statements contained in the bid are true. The bidder has not, directly, or indirectly, submitted his or her bid price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, or paid, and will not pay, any fee to any corporation, partnership, company, association, organization, bid depository, or to any member or agent thereof to effectuate a collusive or sham bid, and has not paid, and will not pay, any person or entity for such purpose.

Any person executing this declaration on behalf of a bidder that is a corporation, partnership, joint venture, limited liability company, limited liability partnership, or any other entity, hereby represents that he or she has full power to execute, and does execute, this declaration on behalf of the bidder.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct and that this declaration is executed on _____ (date), at _____ (city), _____ (state).

Name of Bidder:_____

Signature:_____

Date:_____

IFB 0-2193
EXHIBIT E-1

DBE PARTICIPATION COMMITMENT FORM

THIS FORM MUST BE COMPLETED AND SUBMITTED WITH THE BID AS A CONDITION OF DBE RESPONSIVENESS

NOTE: Refer to instructions on the reverse side of this form.

Bidder to Complete this Section

1. IFB No.: _____

2. Project Name/Description: _____

3. Prime Bidder Name: _____

4. Contract DBE Goal %: _____

5. Bidder's Total Bid Price _____

Required DBE Commitment Information

6. DBE Firm (Name and Address)	**7.** DBE Certification Number	**8.** Description of Scope of Services/Work	**9.** Bid Item (#)	**10.** Dollar Value ($) of Participation	**11.** Dollar Value ($) of Eligible DBE Participation/ Commitment

Note: As a condition of responsiveness, the bidder is required to submit with the Bid a written confirmation signed and dated from each DBE listed in Column 6 acknowledging that the DBE is participating in the contract for the specified dollar value ($) and scope of work.

A quote or bid from the DBE firm can serve in lieu of the written confirmation; however, the dollar amount in the written confirmation, quote/bid and the amount shown on this form MUST match identically.

12. Total Dollar Value ($) of Eligible DBE Participation

$ _____

13. Eligible DBE Participation Represented as a Percentage (%) of Bidder's Total Bid Price

_____%

Bidder Assurance: The bidder certifies that information on this form is complete and accurate, that it has verified the listed DBE(s) certification status and is only crediting eligible DBE participation towards meeting the contract DBE goal.

14. Preparer's Name (Print)	15. Preparer's Signature	16. Preparer's Title
17. Date	18. Telephone No. _(___)_____	19. Email Address

INSTRUCTIONS - DBE Participation Commitment Form

Bidder is required to ensure all information is complete and accurate:

20. **IFB No. -** Enter the IFB Number.
21. **Project Name/Description -** Enter the name and/or description of the project.
22. **Prime Bidder Name -** Enter the bidder's firm name.
23. **Contract DBE Goal % -** Enter the contract DBE goal percentage.
24. **Bidder's Total Bid Price –** Enter the bidder's total bid price.
25. **DBE Firm** – Enter name and address of the proposed DBE firm. Identify all DBE firms being claimed for credit, regardless of tier.
26. **DBE Certification Number -** Enter the DBE's certification identification number. All DBEs must have a valid DBE certification at time of bid opening.
27. **Description of Scope of Services/Work –** Enter the scope of services/work for each DBE firm listed to participate on this contract.
28. **Bid Item (#) -** Enter bid item number.
29. **Dollar Value ($) of Participation -** Enter the total dollar value of participation for each listed DBE firm.
30. **Dollar Value ($) of Eligible DBE Participation/Commitment -** Enter the dollar value of participation eligible to count towards meeting the contract DBE goal. This value should exclude work performed by lower tier subcontractors and account for the DBE's capacity based on their certification type in conformance with the DBE crediting provisions set forth in Title 49 CFR Part 26.55.
31. **Total Dollar Value ($) of Eligible DBE Participation -** Enter the sum of all eligible participation listed in column 11.
32. **Eligible DBE Participation Represented as a Percentage (%) of Bidder's Total Bid Price -** Enter the corresponding percentage of the total eligible DBE participation that the bidder is counting towards the bidder's DBE goal commitment (Formula: Item (12) Total Value of Eligible DBE Participation / Item (5) Bidder's Total Bid Price = Bidder's DBE Goal Commitment Percent (%)).
33. **Preparer's Name (Print) -** Clearly enter the name of the authorized person preparing the form on behalf of the bidder.
34. **Preparer's Signature -** Authorized person's signature.
35. **Preparer's Title -** Enter the position/title of the authorized person signing the form on behalf of the bidder.
36. **Date -** Enter the date the form is signed.
37. **Telephone No. -** Enter the area code and telephone number of the authorized person signing the form on behalf of the bidder.
38. **Email Address -** Enter the email address of the authorized person signing the form on behalf of the bidder.

NOTE: A firm is only eligible to count towards DBE participation in the NAICS codes contained within its California Unified Certification Program (CUCP) DBE Profile. Bidders are to verify that listed DBE's certification contains the NAICS codes relevant to the scope they are being listed to perform.

DBE INFORMATION - GOOD FAITH EFFORTS

IFB No: _____ Bid Opening Date _____

The Orange County Transportation Authority (Authority) established a Disadvantaged Business Enterprise (DBE) goal of _____% for this contract. The information provided herein shows that a good faith effort was made by _____(Bidder).

Bidder shall submit the following information to document adequate good faith efforts to the Authority no later than 4:00 p.m. on the 2nd business day after the Authority's bid due date, or as otherwise specified in the solicitation. Bidder should submit the following information even if the "DBE Participation Commitment Form" indicates that the bidder has met the DBE goal. This will protect the bidder's eligibility for award of the contract if Authority determines that the bidder failed to meet the goal for various reasons, e.g., a DBE firm was not certified at bid opening, or the bidder made a mathematical error.

Submittal of only the form may not provide sufficient documentation to demonstrate that adequate good faith efforts were made.

The following good faith efforts items (A through H) shall be minimally performed prior to bid submission. Bidder to complete the following items in sufficient detail to effectively demonstrate that good faith efforts were undertaken to meet the established DBE goal:

I. Items of Work the Bidder Made Available to DBE Firms; a description of work items and approximate dollar amounts made available to DBE firms by the bidder, value of work items as a percentage of total contract work, breakdown of bid items or larger scopes of contract work (including those items normally performed by the bidder with its own forces) into economically feasible units to facilitate DBE participation sufficient to meet the DBE contract goal. It is the bidder's responsibility to demonstrate that sufficient work was made available to facilitate DBE participation as follows (Provide documents that sufficiently evidence the efforts detailed below):

Description of Work Item	Bidder Normally Performs (Y/N)	Unbundled from Larger Scope (Y/N) If Yes, List Scope and/or Bid Item (#)	Amount ($)	Percentage of Contract

J. Solicitation Effort Documentation; the names and dates of written notices sent to certified DBEs soliciting bids for this project and the dates and methods used to following up initial solicitations to determine with certainty whether the DBEs were interested (attach all copies of solicitation, telephone records, fax confirmations, email communications, etc.), amount of DBEs to repond, documentation to demonstrate the DBE firms were provided information about the contract (location of project, contract number, bid date, items of work made available and contact information) in the Invitation to Bid from the bidder, the bidder solicited through all reasonable means (e.g. attendance at pre-bid meetings, advertising and written notices) the interest of all certified DBEs who have the capability to perform the work of the contract, bidder to provide proof of aforementioned items, and DBEs in the market area for the work identified in 'Item A' as follows:

DBE Firm	Contact Name/Title	Method of Solicitation	Date of Initial Solicitation	Date of Follow-Up Solicitation	Response/ Interested in Bidding

(Note: Solicitations should occur at a minimum no later than 14 calendar days prior to the Authority's bid due date and follow up to the solicitation should allow DBE firms reasonable time to respond). DBE firms solicited must be advised if the original bid date has been extended.

K. Rejected DBE Bid Documentation; the names, addresses, phone numbers, and amount of rejected DBE firms, the reasons for the bidder's rejection of the DBE firms, the firms selected and accepted for that work (attach all copies of quotes from the firms involved inclusive of a detailed cost breakdown if opted to self-perform work) and the price difference for each DBE if the selected firms is not a DBE, include an explanation of quote(s) rejected.

L. Publication Efforts Made to Advertise the Projects to Solicit DBE Participation; names and dates of each publication in which a request for DBE participation for this project was placed by the bidder (attach copies of advertisements or proof of publications). Publications should be placed at a minimum 14 calendar days before the Authority's bid due date. If bid due date is extended, bidder is to re-advertise new bid due date.

Publications	Type of Publication (Trade/General/ Minority/Focus)	Dates of Advertisement	Duration of Advertisement	Readvertisement (Bid-Due Date Extension)

M. Agencies, Organizations, or Groups Contacted to Provide Assistance in Contracting, Recruiting, and Using DBEs; the names of agencies, organizations or groups contacted to provide assistance in contacting, recruiting and using DBE firms (Attach copies of requests to agencies, responses received and efforts made by the bidder in response).

N. Efforts to Provide Information About the Plans, Specifications, and Contract Requirements; efforts made to assist interested DBEs in obtaining necessary materials, or related assistance or services, bidder to provide evidence of effort.

O. Assistance with Lines of Credit, Insurance, and/or other Services; efforts made to assist interested DBEs in obtainting bonding, lines of credit or insurance, and any technical assistance or information related to the plans, specifications and requirements for the work which was provided to DBEs, bidder to provide a list of any assistance provided to prospective and bided DBEs:

P. Additional Data to Support a Demonstration of Good Faith Efforts; in determining whether a bidder made adequate good faith efforts, the Authority will take into account the performance of other bidders in meeting the DBE contract goal. Attach any additional information to support demonstration of good faith in this section:

NOTE: USE ADDITIONAL SHEETS AS NECESSARY TO DEMONSTRATE RESPONSIVENESS.

Bidders List

The Department of Transportation requires the Authority to create and maintain a "Bidders List" containing information about all firms (DBE and Non-DBE) that bid, propose or quote on the Authority's DOT-assisted contracts, in accordance with 49 CFR Part 26.11. The "Bidders List" is intended to be a count of all firms that are participating, or attempting to participate, on DOT-assisted contracts, whether successful or unsuccessful in their attempt to obtain a contract.
The bidder is to complete all requested information for every firm who submitted a bid, proposal or quote, including the primary bidder, and submit this information to the Authority no later than 4:00 p.m. on the 2nd business day after the Authority's bid due date, or as otherwise specified in the solicitation. The Authority will utilize this information to assist in the Authority's DBE goal-setting process.

Prime Name and Location	**Type of Work/Services/Materials Provided:** **NAICS/WCC**	**Subcontract Amount**	**Percentage of Bid Item Sub-contracted**	**Contractor License No.** **DIR Reg Number**	**DBE (Y/N)** **DBE Certification ID**	**Phone:** **E-mail:**	**Annual Gross Receipts**
Prime Bidder: Contact Name: Address:							☐ Less than $1 million ☐ Less than $5 million ☐ Less than $10 million ☐ Less than $15 million ☐ More than $15 million Age of Firm: _____yrs.

Subcontractor Name and Location	**Type of Work/Services/Materials Provided:** **NAICS/WCC**	**Subcontract Amount**	**Percentage of Bid Item Sub-contracted**	**Contractor License No.** **DIR Reg Number**	**DBE (Y/N)** **DBE Certification ID**	**Phone:** **E-mail:**	**Annual Gross Receipts**
Firm Name: Contact Name: Address:							☐ Less than $1 million ☐ Less than $5 million ☐ Less than $10 million ☐ Less than $15 million ☐ More than $15 million Age of Firm: _____yrs.

Subcontractor Name and Location	Type of Work/Services/Materials Provided: NAICS/WCC	Subcontract Amount	Percentage of Bid Item Sub-contracted	Contractor License No. DIR Reg Number	DBE (Y/N) DBE Certification ID	Phone: E-mail:	Annual Gross Receipts
Firm Name: Contact Name: Address:							☐ Less than $1 million ☐ Less than $5 million ☐ Less than $10 million ☐ Less than $15 million ☐ More than $15 million Age of Firm: _____yrs.
Firm Name: Contact Name: Address:							☐ Less than $1 million ☐ Less than $5 million ☐ Less than $10 million ☐ Less than $15 million ☐ More than $15 million Age of Firm: _____yrs.
Name: Contact Name: Address:							☐ Less than $1 million ☐ Less than $5 million ☐ Less than $10 million ☐ Less than $15 million ☐ More than $15 million Age of Firm: _____yrs.

NOTE: USE ADDITIONAL SHEETS AS NECESSARY TO DEMONSTRATE RESPONSIVENESS TO THE BIDDERS LIST REQUIREMENTS.

IRAN CONTRACTING ACT CERTIFICATION

(California Public Contract Code Sections 2200, *et seq.*)

The Iran Contracting Act of 2010 (PCC Sections 2200-2208), prohibits bidders who are engaged in investment activities in the energy sector of Iran from bidding on, submitting proposals for, or entering into or renewing contracts with public entities for goods or services of one million dollars ($1,000,000) or more. At the time of submitting a bid, each bidder must certify that the bidder is not identified on the Department of General Services list of ineligible persons pursuant to PCC Section 2203(b). Each bidder is also required to certify that the bidder is not engaged in investment activities in violation of the Iran Contracting Act of 2010.

A bidder who is engaged in investment activities in the energy sector of Iran is defined as:

3. A person providing goods or services of twenty million dollars ($20,000,000) or more in the energy sector of Iran, including a person that provides oil or liquefied natural gas tankers, or products used to construct or maintain pipelines used to transport oil or liquefied natural gas, for the energy sector of Iran; or
4. A person that is a financial institution that extends twenty million dollars ($20,000,000) or more in credit to another person, for 45 days or more, if that person will use the credit to provide goods or services in the energy sector in Iran and is identified on a list created pursuant to PCC Section 2203(b).

A bidder is not required to certify that it is engaged in investment activities in the energy sector of Iran if the bidder is exempt from the certification under PCC Section 2203(c) or (d). If the bidder is exempt from the certification requirement, the bidder will be required to provide documentation demonstrating the exemption.

To comply with the Iran Contracting Act of 2010, the bidder shall complete **one** of the options below. Please note: under PCC Section 2205, false certification of this form may result in civil penalties of $250,000 or twice the amount of the contract for which false certification was made, termination of the contract, and/or ineligibility to bid on contracts for a period of three years.

Option #1: Certification

I, the official named below, certify I am duly authorized to execute this certification on behalf of the vendor/financial institution identified below, and the vendor/financial institution identified below, and any subcontractor who will perform work or labor or render services to the vendor identified below, is not on the current Department of General Services list identifying persons engaged in investment activities in the energy sector of Iran, and is not a financial institution extending twenty million dollars ($20,000,000) or more in credit to another person/vendor, for 45 days or more, if that other person/vendor will use the credit to provide goods or services in the energy sector in Iran and is identified on the current Department of General Services list identifying persons engaged in investment activities in the energy sector of Iran.

Vendor/Financial Institution: _____

Signature: _____

Name and Title: _____

Date: _____

Option #2: Exemption

Pursuant to PCC Section 2203(c) and (d), a public entity may permit a bidder or financial institution engaged in investment activities in Iran, on a case-by-case basis, to be eligible for, or to bid on, submit proposals for, or enter into or renew a contract with a public entity for goods or services of one million dollars ($1,000,000) or more. If the bidder, financial institution, or any subcontractor who will perform work or labor or render services to the bidder has obtained an exemption from the certification requirement, please complete and sign below and attach the documentation demonstrating the exemption approval.

Vendor/Financial Institution: _____

Signature: _____

Name and Title: _____

Date: _____

Option #3: Non-Applicability

Pursuant to PCC Section 2203(b), a bidder or financial institution engaged in investment activities in Iran may not be eligible for, or to bid on, submit proposals for, or enter into or renew a contract with a public entity for goods or services of one million dollars ($1,000,000) or more. If the contract is not for goods or services of one million dollars ($1,000,000) or more, please sign below indicating that the contract is not for goods or services of one million dollars ($1,000,000) or more and thus bidder is not required to certify and does not meet the exemption.

Vendor/Financial Institution: _____

Signature: _____

Name and Title: _____

Date: _____

BIDDER'S CERTIFICATE
REGARDING
"BUY AMERICA" REQUIREMENTS
FOR
STEEL, IRON, OR MANUFACTURED PRODUCTS

In order to demonstrate compliance with the Buy America Requirements, if the bid is for a contract greater than one hundred and fifty thousand dollars ($150,000), Bidder shall complete only one of the two statements below:

The _____
Firm name/principal

hereby certifies that it **will comply** with the requirements of 49 U.S.C. Section 5323(j), and the applicable regulations in 49 CFR Part 661.

_____
Signature

_____
Name

_____
Title

_____
Date

Or:

The _____
Firm name/principal

hereby certifies that it **cannot comply** with the requirements of 49 U.S.C. Section 5323(j), but may qualify for an exception to the requirement pursuant to 49 U.S.C. Section 5323(j)(2), as amended, and the applicable regulations in 49 CFR Part 661.7.

_____
Signature

_____
Name

_____
Title

_____
Date

Revised: 05/23/2018

CERTIFICATION
LIMITATION ON PAYMENTS TO INFLUENCE CERTAIN FEDERAL TRANSACTIONS

A. DEFINITIONS

1. Authority, as used in this clause, means the Orange County Transportation Authority, acting on behalf of the Orange County Transit District.

2. Covered Federal action, as used in this clause, means any of the following Federal actions:

   a. The awarding of any Federal contract.

   b. The making of any Federal grant.

   c. The making of any Federal loan.

   d. The entering into of any cooperative agreement.

   e. The extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

3. Indian tribe and tribal organization, as used in this clause, have the meaning provided in Section 450b of the Indian self-determination and Education Assistance Act (25 U.S.C. 450) and include Alaskan Natives.

4. Influencing or attempting to influence, as used in this clause, means making, with the intent to influence, any communication to or appearance before an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with any covered Federal action.

5. Local government, as used in this clause, means a unit of government in a State and, if chartered, established, or other were recognized by a State for the performance of a governmental duty, including a local public authority, a special district, an intrastate district, a council of governments, a sponsor group representative organization, and any other instrumentality of a local government.

6. Officer or employee of an agency, as used in this clause, includes the following individuals who are employed by an agency:

   a. An individual who is appointed to a position in the Government under title 5, United States code, including a position under a temporary appointment.

   b. A member of the uniformed services, as defined in the subsection

101(3), Title 37, United States Code.

c. A special Government employee, as defined in Section 202, Title 18, United States Code.

d. An individual who is a member of a Federal advisory committee, as defined by the Federal Advisory Committee Act, Title 5, United States Code, Appendix section 3.

7. Person, as used in this clause, means an individual, corporation, company, association, authority, firm, partnership, society, State, and local government, regardless of whether such entity is operated for profit, or not for profit. This term excludes an Indian tribe, tribal organization or any other Indian organization with respect to expenditures specifically permitted by other Federal law.

8. Reasonable compensation, as used in this clause, means with respect to a regularly employed officer of employee of any person, compensation that is consistent with the normal compensation for such officer or employee for work that is not furnished to, not funded by, or not furnished in cooperation with the Federal Government.

9. Reasonable payment, as used in this clause means, with respect to professional and other technical services, a payment in an amount that is consistent with the amount normally paid for such services in the private sector.

10. Recipient, as used in this clause, includes the CONSULTANT and all subcontractors. This term excludes an Indian tribe, tribal organization, or any other Indian organization with respect to expenditures specifically permitted by other Federal law.

11. Regularly employed, as used in this clause, means, with respect to an officer or employee of a person requesting or receiving by such person for at least 130 working days within one year immediately preceding the date of the submission that initiates agency consideration of such person for receipt of such contract. An officer or employee who is employed by such person for less than 130 working days within one year immediately preceding the date of the submission that initiates agency consideration of such person shall be considered to be regularly employed as soon as he or she is employed by such person for 130 working days.

12. State, as used in this clause, means a State of the United States, the District of Columbia, the Commonwealth of Puerto Rico, a territory or possession of the United States, an agency or instrumentality of a State, and a multi-State regional or interstate entity having governmental duties and powers.

B. PROHIBITIONS

1. Section 1352 of Title 31, United States Code, among other things, prohibits a recipient of a Federal contract, grant, loan or cooperative agreement from using appropriated funds to pay any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with any of the following covered Federal actions: the awarding of any Federal contract; the making of any Federal grant; the making of any Federal loan; the entering into of any cooperative agreement; or, the modification of any Federal contract, grant, loan, or cooperative agreement.

2. The Act also requires consultant to furnish a disclosure if any funds other than Federal appropriated funds (including profit or fee received under a covered Federal transaction) have been paid, or will be paid, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with a Federal contract, grant, loan or cooperative agreement.

3. The prohibitions of the Act do not apply under the following conditions:

   a. Agency and legislative liaison by own employees.

      (1) The prohibition on the use of appropriated funds, in subparagraph C.1. of this clause, does not apply in the case of payment of reasonable compensation made to an officer or employee of a person requesting or receiving a covered Federal action if the payment is for agency and legislative liaison activities not directly related to a covered Federal action.

      (2) For purposes of paragraph C.3.a.(1) of this clause, providing any information specifically requested by an agency or Congress is permitted at any time.

      (3) The following agency and legislative liaison activities are permitted any time where they are not related to a specific solicitation for any covered Federal action:

      Discussing with an agency (including individual demonstrations) the qualities and characteristics of the person's products or services, conditions or terms of sale, and service capabilities.

      Technical discussions and other activities regarding the application of adaptation of the person's products or services for an agency's use.

      (4) The following agency and legislative liaison activities are

permitted where they are prior to formal solicitation of any covered Federal action:

Providing any information not specifically requested but necessary for an agency to make an informed decision about initiation of a covered Federal action;

Technical discussions regarding the preparation of an unsolicited proposal prior to its official submission; and,

Capability presentations by persons seeking awards from an agency pursuant to the provisions of the Small Business Act, as amended by Public Law 95-507, and subsequent amendments.

(5) Only those services expressly authorized by paragraph C.3.a.(1) of this clause are permitted under this clause.

b. Professional and technical services

(1) The prohibition on the use of appropriated funds, in subparagraph C.1. of this clause, does not apply in the case of:

A payment of reasonable compensation made to an officer or employee of a person requesting or receiving a covered Federal action or an extension, continuation, renewal, amendment, or modification of covered Federal action, if payment is for professional or technical services rendered directly in the preparation, submission, or negotiation of any bid, proposal, or application for that Federal action or for meeting requirements imposed by or pursuant to law as condition for receiving that Federal action.

Any reasonable payment to a person, other than an officer or employee of a person requesting or receiving a covered Federal action or an extension, continuation, renewal, amendment, or modification of a covered Federal action if the payment is for professional or technical services rendered directly in the preparation, submission or negotiation of any bid, proposal, or application or that Federal action or for meeting requirements imposed by or pursuant to law as a condition for receiving that Federal action. Persons other than officers or employees of a person requesting or receiving a covered Federal action include contractors and trade associations.

(2) For purposes of paragraph C.3.a.(1) of this clause, professional and technical services shall be limited to advise and analysis directly applying any professional or technical discipline. For example, drafting of a legal document accompanying a bid or

proposal is allowable. Similarly, technical advice provided by an engineer on the performance or operational capability of a piece of equipment rendered directly in the negotiation of a contract is allowable. However, communications with the intent to influence made by a professional (such as a licensed lawyer) or a technical person (such as a licensed accountant) are not allowable under this section unless they provide advice and analysis directly applying their professional or technical expertise and unless the advice or analysis is rendered directly and solely in the preparation, submission, or negotiation of a covered Federal action. Thus, for example, communications with the intent to influence made by a lawyer that do not provide legal advice or analysis directly and solely related to the legal aspects of his or her client's proposal, but generally advocate one proposal over another are not allowable under this section because the lawyer is not providing professional legal services. Similarly, communications with the intent to influence made by an engineer providing an engineering analysis prior to the preparation or submission of a bid or proposal are not allowable under this section since the engineer is providing technical services but not directly in the preparation, submission, or negotiation of a covered Federal action.

(3) Requirements imposed by or pursuant to law as a condition for receiving a covered Federal award include those required by law or regulation and any other requirements in the actual award documents.

(4) Only those services expressly authorized by paragraph C.3.a.(1) and (2) of this clause are permitted under this clause.

(5) The reporting requirements of FAR 3.803(a) shall not apply with respect to payments of reasonable compensation made to regularly employed officers or employees of a person.

c. Disclosure

(1) The consultant who requests or receives from an agency a Federal contract shall file with that agency a disclosure form OMB standard form LLL, Disclosure of Lobbying Activities, (Attachment to the bid package) if such person has made or had agreed to made any payment using non appropriated funds (to include profits from any covered Federal action), which would be prohibited under subparagraph B.1. of this clause, if paid for with appropriated funds.

(2) The consultant shall file a disclosure form at the end of each

calendar quarter in which there occurs any event that materially affects the accuracy of the information contained in any disclosure form previously filed by such person under subparagraph II.A. of this clause. An event that materially affects the accuracy of the information reported includes:

A cumulative increase of $25,000 or more in the amount paid or expected to be paid for influencing or attempting to influence a covered Federal action; or

A change in the person(s) or individual(s) influencing or attempting to influence a covered Federal action; or

A change in the officer(s), employee(s), or Member(s) contacted to influence or attempt to influence a covered Federal action.

(3) The consultant shall require the submittal of a certification, and if required, a disclosure form by any person who requests or receives any subcontract exceeding $100,000 under the Federal contract.

(4) All subcontractor disclosure forms (but not certifications) shall be forwarded from tier to tier until received by the prime consultant. The prime consultant shall submit all disclosures to the District at the end of the calendar quarter in which the disclosure form is submitted by the subcontractor. Each subcontractor certification shall be retained in the subcontract file of the awarding consultant.

d. Agreement

The consultant agrees not to make any payment prohibited by this clause.

e. Penalties

(1) Any person who makes an expenditure prohibited under paragraph a) of this clause or who fails to file or amend the disclosure form to be filed or amended by paragraph d) of this clause shall be subject to civil penalties as provided for by 31 U.S.C. 1352. An imposition of a civil penalty does not prevent the Government from seeking any other remedy that may be applicable.

(2) Consultants may relay without liability on the representation made by their subcontractors in the certification and disclosure forms.

f. Cost Allowability:

Nothing in this clause is to be interpreted to make allowable or reasonable any costs, which will otherwise be unallowable or unreasonable. Conversely, costs made specifically unallowable by the requirements in this clause will not be made allowable under any other provisions.

CERTIFICATION OF RESTRICTIONS ON LOBBYING

I, _____ , hereby certify on behalf (name of bidder/offeror) of

_____ that:
(Firm name)

1. No Federal appropriated funds have been paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer of employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

2. If any funds, other than Federal appropriated funds, have been paid or will be paid to any person for influencing or attempting to influence making lobbying contracts to an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit the attached Standard Form-LLL, "Disclosure of Lobbying Activities", in accordance with its instructions.

3. If bidder/offeror does not have any reportable activities to disclose, they shall check the box entitled “No Reportable Activities” on the attached Standard Form-LLL “Disclosure of Lobbying Activities” and complete Section 16 of the form. The certifying official shall sign and date the form, print his/her name, title and telephone number.

4. The undersigned shall require that the language of this certification be included in all subcontracts, and that all subcontractors shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance is placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code. Any person who fails to file the required certification shall be subject to civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

The bidder/offeror, _____, certifies or affirms the truthfulness and accuracy of each statement of its certification and disclosure, if any. In addition, the bidder/offeror understands and agrees that the provisions of 31 U.S.C. 3801, et seq. apply to this certification and disclosure, if any.

Executed this _____day of _____,20___

By _____
(Signature of authorized official)

_____
(Title of authorized official)

☐ **NO REPORTABLE ACTIVITIES** *(Bidder/Offeror required to complete Section 16 below.)*

DISCLOSURE OF LOBBYING ACTIVITIES

Approved by OMB 003480045

Complete this form to disclose lobbying activities pursuant to 31 U.S.C. 1352
(See reverse for public burden disclosure.)

1. Type of Federal Action:	2. Status of Federal Action:	3. Report Type:
☐ a. contract b. grant c. cooperative agreement d. loan e. loan guarantee f. loan insurance	☐ a. bid/offer application b. initial award c. post-award	☐ a. initial filing b. material changes For Material Change Only: year _____ quarter _____ date of last report _____

4. Name and Address of Reporting Entity:	5. If Reporting Entity in No. 4 is Subawardee, Enter Name and Address of Prime:
☐ Prime ☐ Subawardee Tier _____, *if known*: Congressional District, *if known*:	Congressional District, *if known*:
6. Federal Department/Agency:	7. Federal Program Name/Description: CFDA number, *if applicable*: _____
8. Federal Action Number, *if known*:	9. Award Amount, *if known*: $
10. a. Name and Address of Lobbying Entity (if individual, last name, first name, MI)	b. Individuals Performing Services (including address if different from No 10a) (last name, first name, MI):

(attach Continuation Sheet(s) SF - LLL - A if necessary)

11. Amount of Payment (check all that apply):	13. Type of Payment (check all that apply):
$_____ ☐ actual ☐ planned	☐ a. retainer ☐ b. one-time fee ☐ c. commission ☐ d. contingent fee ☐ e. deferred ☐ f. other specify: _____
12. Forum of Payment (check all that apply): ☐ a. cash ☐ b. in-kind; specify nature: _____ value: _____	

14. Brief Description of Services Performed or to be Performed and Date(s) of Service, including officer(s), employee(s) or Member(s) contracted for Payment indicated in Item, 11:

(attach Continuation Sheet(s) SF-LLL-A if necessary)

15. Continuation Sheet(s) SF-LLL-A attached: ☐ Yes ☐ No

16. Information requested through this form is authorized by Code 31 U.S.C. Section 1352. This disclosure of lobbying activities is a material representation of fact upon which reliance was placed by the tier above when this transaction was made or entered into. This disclosure is required pursuant to 31 U.S.C. 1352. This information will be reported to the Congress semi-annually and will be available for public inspection. Any person who fails to file the required disclosure shall be subject to a civil penalty of not less than $10,000.00 and not more than $100,000.00 for each such failure.	Signature: _____ Print name: _____ Title: _____ Telephone No: _____ Date: _____

Federal Use Only	Authorized for Local Reproduction Standard Form - LLL

Approved by
OMB
003480045

INSTRUCTIONS FOR COMPLETION OF SF-LLL DISCLOSURE OF LOBBYING ACTIVITIES

This DISCLOSURE FORMS SHALL BE COMPLETED BY the reporting entity, whether Subawardee or prime Federal recipient, at the initiation or receipt of a covered Federal action, or a material change to a previous filing, pursuant to title 31 U.S.C. section 1352. The filing of a form is required for each payment or agreement to make payment to any lobbying entity for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with a covered Federal action. Use the SF-LLL-A Continuation Sheet for additional information if the space on the form is inadequate. Complete all items that apply for both the initial filing and material change report. Refer to the implementing guidance published by the Office of Management and Budget for additional information.

1. Identify the type of covered Federal action for which lobbying activity is and/or has been secured to influence the outcome of a covered Federal action.

2. Identify the status of the covered Federal action.

3. Identify the appropriate classification of this report. If this is a follow-up report caused by a material change to the information previously reported, enter the year and quarter in which the change occurred. Enter the date of the last previously submitted report by this reporting entity for this covered Federal action.

4. Enter the full name, address, city, state and zip code of the reporting entity. Include Congressional District, if known. Check the appropriate classification of the reporting entity that designates if it is, or expects to be a prime or subaward recipient. Identify the tier of the subawardee e.g., the first subawardee of the prime is the first tier. Subawards include but are not limited to subcontracts, subgrants and contract awards under grants.

5. If the organization filing the report in item 4 checks "Subawardee" then enter the full name, address city, state, and zip code of the prime Federal recipient. Include Congressional District.

6. Enter the name of the Federal agency making the award or loan commitment. Include at least one organizational level below agency, name if known. For example, Department of Transportation, United State Coast Guard.

7. Enter the Federal program name for description of the covered Federal action (item 1). If known, enter the full Catalog of Federal Domestic Assistance (CFDA) number for grants, cooperative agreements, loans, and loan commitments.

8. Enter the most appropriate Federal identifying number available for the Federal action identified in item 1 (e.g. Request for Proposal (RFP) number, Invitation for Bid (IFB) number, grant announcement number, the contract, grant, or loan award number, the application/ proposal control number assigned by the Federal agency). Include prefixes, e.g., "RFP DE-90-001."

9. For a covered Federal action where there has been an award or loan commitment by the Federal agency, enter the Federal amount of the award/loan commitment for the prime entity identified in item 4 or 5.

10. (a) Enter the full name, address, city, state, and zip code of the lobbying entity engaged by the reporting entity identified in item 4 to influence the covered Federal action.

    (b) Enter the full names of the individual(s) performing services, and include full address if different from 10 (a.). Enter Last Name, First Name, and Middle Initial (MI).

11. Enter the amount of compensation paid or reasonably expected to be paid by the reporting entity (item 4) to the lobbying entity (item 10). Indicate whether the payment has been made (actual) or will be made (planned). Check all boxes that apply. If this is a material change report, enter the cumulative amount of payment made or planned to be made.

12. Check the appropriate box (es). Check all boxes that apply. If payment is made through an in-kind contribution, specify the nature and value of the in-kind payment.

13. Check the appropriate box (es). Check all boxes that apply. If other, specify nature.

14. Provide a specific and detailed description of the services that the lobbyist has performed, or will be expected to perform, and the date(s) of any services rendered. Include all preparatory and related activity, not just time spent in actual contact with Federal officials. Identify the Federal official(s) or employee(s) contacted or the officer(s), employee(s), or Member(s) of Congress that were contacted.

15. Check whether or not a SF-LLL-A Continuation Sheet(s) is attached.

16. The certifying official shall sign and date the form, print his/her name, title, and telephone number.

Approved by OMB 003480045

DISCLOSURE OF LOBBYING ACTIVITIES CONTINUATION SHEET

Reporting Entity:_____ **Page** _____ **of** _____

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