10-1.93 STEEL STRUCTURES:

Construction of steel structures shall conform to the provisions in Section 55, "Steel Structures" of the Standard Specifications and these Special Provisions.

GENERAL

Attention is directed to "Welding" in Section 8, "Materials" of these Special Provisions.

The following substitutions of high-strength steel fasteners shall be made:

METRIC SIZE SHOWN ON THE PLANS	SIZE TO BE SUBSTITUTED
ASTM Designation: A 325M (Nominal bolt diameter (mm))	ASTM Designation: A 325 (Nominal bolt diameter (inch))
13, 12.70, or M12	1/2
16, 15.88, or M16	5/8
19, 19.05, or M20	3/4
22, 22.22, or M22	7/8
24, 25, 25.40, or M24	1
29, 28.58, or M27	1 1/8
32, 31.75, or M30	1 1/4
38, 38.10, or M36	1 1/2

MATERIALS

Structural steel rolled shapes used in "Overhead Sign Structures and "Standards, Steel Pedestals and Posts" shall conform to the Charpy V-notch impact values specified for steel plate in Section 55-2, "Materials" of the Standard Specifications.

High-strength fastener assemblies and other bolts attached to structural steel with nuts and washers shall be zinc-coated. When direct tension indicators are used in these assemblies, the direct tension indicator and all components of the fastener assembly shall be zinc-coated by the mechanical deposition process.

ROTATIONAL CAPACITY TESTING PRIOR TO SHIPMENT TO JOB SITE

Rotational capacity tests shall be performed on all lots of high-strength fastener assemblies prior to shipment of these lots to the project site. Zinc-coated assemblies shall be tested after all fabrication, coating, and lubrication of components has been completed. One hardened washer shall be used under each nut for the tests.

The requirements of this section do not apply to high-strength cap screws or high-strength bolts used for slip base plates.

Each combination of bolt production lot, nut lot, and washer lot shall be tested as an assembly.

A rotational capacity lot number shall be assigned to each combination of lots tested. Each shipping unit of fastener assemblies shall be plainly marked with the rotational capacity lot number.

Two fastener assemblies from each rotational capacity lot shall be tested.

The following equipment, procedure, and acceptance criteria shall be used to perform rotational capacity tests on and determine acceptance of long bolts. Fasteners are considered to be long bolts when full nut thread engagement can be achieved when installed in a bolt tension measuring device:

A. Long Bolt Test Equipment:

1. Calibrated bolt tension measuring device with adequate tension capacity for the bolts being tested.
2. Calibrated dial or digital torque wrench. Other suitable tools will be required for performing Steps 7 and 8 of the Long Bolt Test Procedure. A torque multiplier may be required for large diameter bolts.
3. Spacer washers or bushings. When spacer washers or bushings are required, they shall have the same inside diameter and equal or larger outside diameter as the appropriate hardened washers conforming to the requirements in ASTM Designation: F436.
4. Steel beam or member, such as a girder flange or cross frame, to which the bolt tension measuring device will be attached. The device shall be accessible from the ground.

B Long Bolt Test Procedure:

1. Measure the bolt length. The bolt length is defined as the distance from the end of the threaded portion of the shank to the underside of the bolt head.
2. Install the nut on the bolt so that 3 to 5 full threads of the bolt are located between the bearing face of the nut and the underside of the bolt head. Measure and record the thread stickout of the bolt. Thread stickout is determined by measuring the distance from the outer face of the nut to the end of the threaded portion of the shank.
3. Insert the bolt into the bolt tension measuring device and install the required number of washers, and additional spacers as needed, directly beneath the nut to produce the thread stickout measured in Step 2 of this procedure.
4. Tighten the nut using a hand wrench to a snug-tight condition. The snug tension shall not be less than the Table A value but may exceed the Table A value by a maximum of 2 kips.

Table A

High-Strength Fastener Assembly Tension Values to Approximate Snug-Tight Condition	
Bolt Diameter (inches)	Snug Tension (kips)
1/2	1
5/8	2
3/4	3
7/8	4
1	5
1 1/8	6
1 1/4	7
1 3/8	9
1 1/2	10

5. Match-mark the assembly by placing a heavy reference start line on the face plate of the bolt tension measuring device which aligns with 1) a mark placed on one corner of the nut, and 2) a radial line placed across the flat on the end of the bolt, or on the exposed portions of the threads of tension control bolts. Place an additional mark on the outside of the socket that overlays the mark on the nut corner such that this mark will be visible while turning the nut. Make an additional mark on the face plate, either 2/3 of a turn, one turn, or 1 1/3 turn clockwise from the heavy reference start line, depending on the bolt length being tested as shown in Table B.

Table B

Required Nut Rotation for Rotational Capacity Tests[a,b]	
Bolt Length (measured in Step 1)	Required Rotation (turn)
4 bolt diameters or less	2/3
Greater than 4 bolt diameters but no more than 8 bolt diameters	1
Greater than 8 bolt diameters, but no more than 12 bolt diameters[c]	1 1/3

(a) Nut rotation is relative to bolt, regardless of the element (nut or bolt) being turned. For bolts installed by 1/2 turn and less, the tolerance shall be plus or minus 30 degrees; for bolts installed by 2/3 turn and more, the tolerance shall be plus or minus 45 degrees.
(b) Applicable only to connections in which all material within grip of the bolt is steel.
(c) When bolt length exceeds 12 diameters, the required rotation shall be determined by actual tests in a suitable tension device simulating the actual conditions.

6. Turn the nut to achieve the applicable minimum bolt tension value listed in Table C. After reaching this tension, record the moving torque, in foot-pounds,

required to turn the nut, and also record the corresponding bolt tension value in pounds. Torque shall be measured with the nut in motion. Calculate the value, T (in ft-lbs), where T=[(the measured tension in pounds) x (the bolt diameter in inches) / 48 in/ft].

Table C

Minimum Tension Values for High-Strength Fastener Assemblies	
Bolt Diameter (inches)	Minimum Tension (kips)
1/2	12
5/8	19
3/4	28
7/8	39
1	51
1 1/8	56
1 1/4	71
1 3/8	85
1 1/2	103

7. Turn the nut further to increase bolt tension until the rotation listed in Table B is reached. The rotation is measured from the heavy reference line made on the face plate after the bolt was snug-tight. Record this bolt tension.
8. Loosen and remove the nut and examine the threads on both the nut and bolt.

C. Long Bolt Acceptance Criteria:

1. An assembly shall pass the following requirements to be acceptable: 1) the measured moving torque (Step 6) shall be less than or equal to the calculated value, T (Step 6), 2) the bolt tension measured in Step 7 shall be greater than or equal to the applicable turn test tension value listed in Table D, 3) the nut shall be able to be removed from the bolt without signs of thread stripping or galling after the required rotation in Step 7 has been achieved, 4) the bolt does not shear from torsion or fail during the test, and 5) the assembly does not seize before the final rotation in Step 7 is reached. Elongation of the bolt in the threaded region between the bearing face of the nut and the underside of the bolt head is expected and will not be considered a failure. Both fastener assemblies tested from one rotational capacity lot shall pass for the rotational capacity lot to be acceptable.

Table D

Turn Test Tension Values	
Bolt Diameter (inches)	Turn Test Tension (kips)
1/2	14
5/8	22
3/4	32
7/8	45
1	59
1 1/8	64
1 1/4	82
1 3/8	98
1 1/2	118

The following equipment, procedure, and acceptance criteria shall be used to perform rotational capacity tests on and determine acceptance of short bolts. Fasteners are considered to be short bolts when full nut thread engagement cannot be achieved when installed in a bolt tension measuring device:

A. Short Bolt Test Equipment:

1. Calibrated dial or digital torque wrench. Other suitable tools will be required for performing Steps 7 and 8 of the Short Bolt Test Procedure. A torque multiplier may be required for large diameter bolts.
2. Spud wrench or equivalent.
3. Spacer washers or bushings. When spacer washers or bushings are required, they shall have the same inside diameter and equal or larger outside diameter as the appropriate hardened washers conforming to the requirements in ASTM Designation: F436.
4. Steel plate or girder with a hole to install bolt. The hole size shall be 1.6-mm greater than the nominal diameter of the bolt to be tested. The grip length, including any plates, washers, and additional spacers as needed, shall provide the proper number of threads within the grip, as required in Step 2 of the Short Bolt Test Procedure.

B. Short Bolt Test Procedure:

1. Measure the bolt length. The bolt length is defined as the distance from the end of the threaded portion of the shank to the underside of the bolt head.
2. Install the nut on the bolt so that 3 to 5 full threads of the bolt are located between the bearing face of the nut and the underside of the bolt head. Measure and record the thread stickout of the bolt. Thread stickout is determined by measuring the distance from the outer face of the nut to the end of the threaded portion of the shank.
3. Install the bolt into a hole on the plate or girder and install the required number of washers and additional spacers as needed between the bearing face of the nut and the underside of the bolt head to produce the thread stickout measured in Step 2 of this procedure.

4. Tighten the nut using a hand wrench to a snug-tight condition. The snug condition shall be the full manual effort applied to the end of a 305-mm long wrench. This applied torque shall not exceed 20 percent of the maximum allowable torque in Table E.

Table E

Maximum Allowable Torque for High-Strength Fastener Assemblies	
Bolt Diameter (inches)	Torque (ft-lbs)
1/2	145
5/8	285
3/4	500
7/8	820
1	1220
1 1/8	1500
1 1/4	2130
1 3/8	2800
1 1/2	3700

5. Match-mark the assembly by placing a heavy reference start line on the steel plate or girder which aligns with 1) a mark placed on one corner of the nut and 2) a radial line placed across the flat on the end of the bolt or on the exposed portions of the threads of tension control bolts. Place an additional mark on the outside of the socket that overlays the mark on the nut corner such that this mark will be visible while turning the nut. Make 2 additional small marks on the steel plate or girder, one 1/3 of a turn and one 2/3 of a turn clockwise from the heavy reference start line on the steel plate or girder.
6. Using the torque wrench, tighten the nut to the rotation value listed in Table F. The rotation is measured from the heavy reference line described in Step 5 made after the bolt was snug-tight. A second wrench shall be used to prevent rotation of the bolt head during tightening. Measure and record the moving torque after this rotation has been reached. The torque shall be measured with the nut in motion.

Table F

Nut Rotation Required for Turn-of-Nut Installation(a,b)	
Bolt Length (measured in Step 1)	Required Rotation (turn)
4 bolt diameters or less	1/3
(a) Nut rotation is relative to bolt, regardless of the element (nut or bolt) being turned. For bolts installed by 1/2 turn and less, the tolerance shall be plus or minus 30 degrees. (b) Applicable only to connections in which all material within grip of the bolt is steel.	

7. Tighten the nut further to the 2/3-turn mark as indicated in Table G. The rotation is measured from the heavy reference start line made on the plate or girder when the bolt was snug-tight. Verify that the radial line on the bolt end

or on the exposed portions of the threads of tension control bolts is still in alignment with the start line.

Table G

Required Nut Rotation for Rotational Capacity Test	
Bolt Length (measured in Step 1)	Required Rotation (turn)
4 bolt diameters or less	2/3

8. Loosen and remove the nut and examine the threads on both the nut and bolt.

C. Short Bolt Acceptance Criteria:

1. An assembly shall pass the following requirements to be acceptable: 1) the measured moving torque from Step 6 shall be less than or equal to the maximum allowable torque from Table E, 2) the nut shall be able to be removed from the bolt without signs of thread stripping or galling after the required rotation in Step 7 has been achieved, 3) the bolt does not shear from torsion or fail during the test, and 4) the assembly shall not seize before the final rotation in Step 7 is reached. Elongation of the bolt in the threaded region between the bearing face of the nut and the underside of the bolt head will not be considered a failure. Both fastener assemblies tested from one rotational capacity lot shall pass for the rotational capacity lot to be acceptable.

INSTALLATION TENSION TESTING AND ROTATIONAL CAPACITY TESTING AFTER ARRIVAL ON THE JOB SITE

Installation tension tests and rotational capacity tests on high-strength fastener assemblies shall be performed by the Contractor prior to acceptance or installation and after arrival of the fastener assemblies on the project site. Installation tension tests and rotational capacity tests shall be performed at the job-site, in the presence of the Engineer, on each rotational capacity lot of fastener assemblies.

The requirements of this section do not apply to high-strength cap screws or high-strength bolts used for slip base plates.

Installation tension tests shall be performed on 3 representative fastener assemblies in conformance with the provisions in Section 8, "Installation" of the RCSC Specification. For short bolts, Section 8.2, "Pretensioned Joints" of the RCSC Specification shall be replaced by the "Pre-Installation Testing Procedures," of the "Structural Bolting Handbook," published by the Steel Structures Technology Center, Incorporated.

The rotational capacity tests shall be performed in conformance with the requirements for rotational capacity tests in "Rotational Capacity Testing Prior to Shipment to Job Site" of these Special Provisions.

At the Contractor's expense, additional installation tension tests, tests required to determine job inspecting torque, and rotational capacity tests shall be performed by the Contractor on each rotational capacity lot, in the presence of the Engineer, if 1) any

fastener is not used within 3 months after arrival on the jobsite, 2) fasteners are improperly handled, stored, or subjected to inclement weather prior to final tightening, 3) significant changes are noted in original surface condition of threads, washers, or nut lubricant, or 4) the Contractor's required inspection is not performed within 48 hours after all fasteners in a joint have been tensioned.

Failure of a job-site installation tension test or a rotational capacity test will be cause for rejection of unused fasteners that are part of the rotational capacity lot.

When direct tension indicators are used, installation verification tests shall be performed in conformance with Appendix Section X1.4 of ASTM Designation: F959, except that bolts shall be initially tensioned to a value 5 percent greater than the minimum required bolt tension.

SURFACE PREPARATION

For all bolted connections, the contact surfaces and inside surfaces of bolt holes shall be cleaned and coated before assembly in conformance with the provisions for cleaning and painting structural steel of these Special Provisions.

SEALING

The perimeter around all direct tension indicator gaps shall be completely sealed with non-silicone type sealing compound conforming to the provisions in Federal Specification TT-S-230, Type II. The sealant shall be gray in color and have a minimum thickness of 1.3-mm. If painting is required, the sealing compound shall be applied prior to painting.

When zinc-coated tension control bolts are used, the sheared end of each fastener shall be completely sealed with non-silicone type sealing compound conforming to the provisions in Federal Specification TT-S-230, Type II. The sealant shall be gray in color and shall have a minimum thickness of 1.3-mm. The sealant shall be applied to a clean sheared surface on the same day that the splined end is sheared off.

WELDING

Table 2.2 of AWS D1.5 is superseded by the following table:

Base Metal Thickness of the Thicker Part Joined, mm	Minimum Effective Partial Joint Penetration Groove Weld Size, * mm
Over 6 to 13 inclusive	5
Over 13 to 19 inclusive	6
Over 19 to 38 inclusive	8
Over 38 to 57 inclusive	10
Over 57 to 150 inclusive	13
Over 150	16

* Except the weld size need not exceed the thickness of the thinner part

Dimensional details and workmanship for welded joints in tubular and pipe connections shall conform to the provisions in Part A, "Common Requirements of Nontubular and Tubular Connections," and Part D, "Specific Requirements for Tubular Connections" in Section 2 of AWS D1.1.

The requirement of conformance with AWS D1.5 shall not apply to work conforming to Section 56-1, "Overhead Sign Structures" or Section 86-2.04, "Standards, Steel Pedestals and Posts" of the Standard Specifications.

10-1.94 SIGN STRUCTURES:

Sign structures and foundations for overhead signs shall conform to the provisions in Section 56-1, "Overhead Sign Structures" of the Standard Specifications, "Steel Structures" of these Special Provisions, and the following requirements.

Before commencing fabrication of sign structures, the Contractor shall submit 2 sets of working drawings to the Engineer in conformance with the provisions in Section 5-1.02, "Plans and Working Drawings" of the Standard Specifications. The working drawings shall include sign panel dimensions, span lengths, post heights, anchorage layouts, proposed splice locations, a snugging and tensioning pattern for anchor bolts and high-strength bolted connections, and details for permanent steel anchor bolt templates. The working drawings shall be supplemented with a written quality control program that includes methods, equipment, and personnel necessary to satisfy the requirements specified herein.

Working drawings shall be 559-mm x 864-mm or 279-mm x 432-mm in size and each drawing and calculation sheet shall include the State assigned designations for the sign structure type and reference as shown on the contract plans, District-County-Route-Kilometer Post, and contract number.

The Engineer shall have 30 days to review the sign structure working drawings after a complete submittal has been received. No fabrication or installation of sign structures shall be performed until the working drawings are approved in writing by the Engineer.

Should the Engineer fail to complete the review within the time allowance and if, in the opinion of the Engineer, the Contractor's controlling operation is delayed or interfered with by reason of the delay in reviewing the sign structure working drawings, the delay will be considered a right of way delay in conformance with the provisions in Section 8-1.09, "Right of Way Delays" of the Standard Specifications.

Steel bolts not designated on the plans as high strength (HS) or stainless steel shall be for general applications and shall conform to the requirements in ASTM Designation: A 307. A permanent steel template shall be used to maintain the proper anchor bolt spacing.

One top nut, one leveling nut, and 2 washers shall be provided for the upper threaded portion of each anchor bolt.

Flatness of surfaces for the following shall conform to the requirements in ASTM Designation: A 6/A 6M:

A. Base plates that are to come in contact with concrete, grout, or washers and leveling nuts.
B. Plates in high-strength bolted connections.

No holes shall be made in members unless the holes are shown on the plans or are approved in writing by the Engineer.

Longitudinal seam welds shall have 60 percent minimum penetration, except that within 150 mm of circumferential welds, longitudinal seam welds shall be complete joint penetration (CJP) groove welds. In addition, longitudinal seam welds on structures having telescopic pole segment splices shall be CJP groove welds on the female end for a length on each end equal to the designated slip fit splice length plus 150-mm.

Steel members used for overhead sign structures shall receive nondestructive testing (NDT) in conformance with AWS D1.1 and the following:

A.

Weld Location	Weld Type	Minimum Required NDT
Splice welds around the perimeter of tubular sections, poles, and arms.	CJP groove weld with backing ring	100% UT[a] or RT[b]
Longitudinal seam welds	CJP or PJP[c] groove weld	Random 25% MT[d]
Longitudinal seam welds within 150-mm of a circumferential splice.	CJP groove weld	100% UT or RT
Welds attaching base plates, flange plates, or pole or mast arm plates, to poles or arm tubes.	CJP groove weld with backing ring and reinforcing fillet	t> 4.5-mm: 100%UT and MT t< 4.5-mm: 100% MT after root weld pass & final weld pass t = pole or arm thickness
	External (top) fillet weld for socket-type connections	100% MT

[a] ultrasonic testing
[b] radiographic testing
[c] partial joint penetration
[d] magnetic particle testing

B. The acceptance and repair criteria for UT of welded joints where any of the members are less than 8-mm thick or where tubular sections are less than 325-mm in diameter shall conform to the requirements in AWS D1.1, Section 6.13.3.1. A written procedure approved by the Engineer shall be used when performing this UT. These written procedures shall conform to the requirements in AWS D1.1, Annex K. The acceptance and repair criteria for other welded joints receiving UT shall conform to the requirements in AWS D1.1, Section 6, Table 6.3 for cyclically loaded nontubular connections.

C. The acceptance and repair criteria for radiographic or real time image testing shall conform to the requirements of AWS D1.1 for tensile stress welds.

D. For longitudinal seam welds, the random locations for NDT will be selected by the Engineer. The cover pass shall be ground smooth at the locations to be tested. If repairs are required in a portion of a tested weld, the repaired portion shall receive NDT, and additional NDT shall be performed on untested portions of the weld. The additional NDT shall be performed on 25 percent of that longitudinal seam weld. After this additional NDT is performed and if more repairs are required, then that entire longitudinal seam weld shall receive NDT.

Circumferential welds and base plate to post welds may be repaired only one time without written permission from the Engineer.

All ferrous metal parts of tubular sign structures shall be galvanized and shall not be painted.

Full compensation for furnishing anchor bolt templates and for testing of welds shall be considered as included in the contract prices paid per kilogram for Furnish Sign Structure of the type as shown on the Engineer's Estimate, and no additional compensation will be allowed therefor.

10-1.95 ROADSIDE SIGNS:

Roadside signs shall be furnished and installed at the locations shown on the plans or where designated by the Engineer and in conformance with the provisions in Section 56-2, "Roadside Signs" of the Standard Specifications and these Special Provisions.

The Contractor shall furnish roadside sign panels in conformance with the provisions in "Furnish Sign" of these Special Provisions.

Wood posts shall be pressure treated after fabrication in conformance with the provisions in Section 58, "Preservative Treatment of Lumber, Timber and Piling" of the Standard Specifications and AWPA Use Category System: UC4A, Commodity Specification A or B. Type N, Type P, and Type R marker panels mounted on a post with a roadside sign shall be considered to be sign panels and will not be paid for as markers.

All signs shall be installed using hex head bolts, washers, nuts and jam nuts in accordance with the Standard Plans RS2 or as directed by the Engineer.

The contract unit prices paid for Roadside Sign shall include full compensation for furnishing all labor, tools, materials, equipment and for doing all work involved and complete in place, including excavation and backfill, furnishing and placing of concrete, and no additional compensation will be allowed therefor.

10-1.96 INSTALL ROADSIDE SIGN PANEL ON EXISTING POST:

Roadside sign panels shall be installed on existing posts at the locations shown on the plans or where designated by the Engineer and in conformance with the provisions in Section 56-2.04, "Sign Panel Installation" of the Standard Specifications and these Special Provisions.

The Contractor shall furnish roadside sign panels in conformance with the provisions in "Furnish Sign" of these Special Provisions.

Cutting the ends of wood posts in the field and field application of wood preservatives shall conform to the provisions in Section 56-2.02B, "Wood Posts" of the Standard Specifications.

Two holes shall be drilled in each existing post as required to provide a breakaway feature as shown on the plans.

Existing sign panels, as shown on the plans, shall be removed and salvaged or removed and disposed of as provided in Section 15, "Existing Highway Facilities" of the Standard Specifications.

Installing roadside sign panels on existing posts will be paid for by the unit as determined from actual count in place.

The contract unit prices paid for Install Sign of the type as shown on the Engineer's Estimate shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in installing roadside sign panels on existing posts (including drilling holes in existing posts, removing, salvaging, and disposing of existing sign panels), complete in place, as shown on the plans, as specified in the Standard Specifications and these Special Provisions, and as directed by the Engineer.

10-1.97 FURNISH SIGN:

Signs shall be fabricated and furnished in accordance with details shown on the plans, the Traffic Sign Specifications, and these Special Provisions.

Traffic Sign Specifications for California sign codes are available for review at:

http://www.dot.ca.gov/hq/traffops/signtech/signdel/specs.htm

Traffic Sign Specifications for signs referenced with Federal MUTCD sign codes can be found in Standard Highway Signs Book, administered by the Federal Highway Administration, which is available for review at:

http://mutcd.fhwa.dot.gov/ser-shs_millennium.htm

Information on cross-referencing California sign codes with the Federal MUTCD sign codes is available at:

http://www.dot.ca.gov/hq/traffops/signtech/signdel/specs.htm

Temporary or permanent signs shall be free from blemishes that may affect the serviceability and detract from the general sign color and appearance when viewing during daytime and nighttime from a distance of 8 m. The face of each finished sign shall be uniform, flat, smooth, and free of defects, scratches, wrinkles, gel, hard spots, streaks, extrusion marks, and air bubbles. The front, back, and edges of the sign panels shall be free of router chatter marks, burns, sharp edges, loose rivets, delaminated skins, excessive adhesive over spray and aluminum marks.

QUALITY CONTROL FOR SIGNS

The requirements of "Quality Control for Signs" in this section shall not apply to construction area signs.

No later than 14 days before sign fabrication, the Contractor shall submit a written copy of the quality control plan for signs to the Engineer for review. The Engineer will have 10 days to review the quality control plan. Sign fabrication shall not begin until the Engineer approves the Contractor's quality control plan in writing. The Contractor shall submit to the Engineer at least 3 copies of the approved quality control plan. The quality control plan shall include, but not be limited to the following requirements:

A. Identification of the party responsible for quality control of signs,
B. Basis of acceptance for incoming raw materials at the fabrication facility,
C. Type, method and frequency of quality control testing at the fabrication facility,
D. List (by manufacturer and product name) of process colors, protective overlay film, retroreflective sheeting and black non-reflective film,
E. Recommended cleaning procedure for each product, and
F. Method of packaging, transport and storage for signs.

No legend shall be installed at the project site. Legend shall include letters, numerals, tildes, bars, arrows, route shields, symbols, logos, borders, artwork, and miscellaneous characters. The style, font, size, and spacing of the legend shall conform to the Standard Alphabets published in the FHWA Standard Highway Signs Book. The legend shall be oriented in the same direction in accordance with the manufacturer's orientation marks found on the retroreflective sheeting.

On multiple panel signs, legend shall be placed across joints without affecting the size, shape, spacing, and appearance of the legend. Background and legend shall be wrapped around interior edges of formed panel signs as shown on plans to prevent delamination.

The following notation shall be placed on the lower right side of the back of each sign where the notation will not be blocked by the sign post or frame:

A. PROPERTY OF STATE OF CALIFORNIA,
B. Name of the sign manufacturer,

C. Month and year of fabrication,
D. Type of retroreflective sheeting, and
E. Manufacturer's identification and lot number of retroreflective sheeting.

The above notation shall be applied directly to the aluminum sign panels in 6-mm upper case letters and numerals by die-stamp and applied by similar method to the fiberglass reinforced plastic signs. Painting, screening, or engraving the notation will not be allowed. The notation shall be applied without damaging the finish of the sign.

Signs with a protective overlay film shall be marked with a dot of 10-mm diameter. The dot placed on white border shall be black, while the dot placed on black border shall be white. The dot shall be placed on the lower border of the sign before application of the protective overlay film and shall not be placed over the legend and bolt holes. The application method and exact location of the dot shall be determined by the manufacturer of the signs.

For sign panels that have a minor dimension of 1220-mm or less, no splice will be allowed in the retroreflective sheet except for the splice produced during the manufacturing of the retroreflective sheeting. For sign panels that have a minor dimension greater than 1220-mm, only one horizontal splice will be allowed in the retroreflective sheeting.

Unless specified by the manufacturer of the retroreflective sheeting, splices in retroreflective sheeting shall overlap by a minimum of 25-mm. Splices shall not be placed within 50-mm from edges of the panels. Except at the horizontal borders, the splices shall overlap in the direction from top to bottom of the sign to prevent moisture penetration. The retroreflective sheeting at the overlap shall not exhibit a color difference under the incident and reflected light.

Signs exhibiting a significant color difference between daytime and nighttime shall be replaced immediately.

Repairing sign panels will not be allowed except when approved by the Engineer.

The Department will inspect signs at the Contractor's facility and delivery location, and in accordance with Section 6, "Control of Materials" of the Standard Specifications. The Engineer will inspect signs for damage and defects before and after installation.

Regardless of kind, size, type, or whether delivered by the Contractor or by a common carrier, signs shall be protected by thorough wrapping, tarping, or other methods to ensure that signs are not damaged by weather conditions and during transit. Signs shall be dry during transit and shipped on palettes, in crates, or tier racks. Padding and protective materials shall be placed between signs as appropriate. Finished sign panels shall be transported and stored by method that protects the face of signs from damage. The Contractor shall replace wet, damaged, and defective signs.

Signs shall be stored in dry environment at all times. Signs shall not rest directly on the ground or become wet during storage. Signs, whether stored indoor or outdoor, shall be free standing. In areas of high heat and humidity signs shall be stored in enclosed

climate-controlled trailers or containers. Signs shall be stored indoor if duration of the storage will exceed 30 days.

Screen processed signs shall be protected, transported and stored as recommended by the manufacturer of the retroreflective sheeting.

When requested, the Contractor shall provide the Engineer test samples of signs and materials used at various stages of production. Sign samples shall be 300-mm x 300-mm in size with applied background, letter or numeral, and border strip.

The Contractor shall assume the costs and responsibilities resulting from the use of patented materials, equipment, devices, and processes for the Contractor's work.

SHEET ALUMINUM

Alloy and temper designations for sheet aluminum shall be in accordance with ASTM Designation: B209.

The Contractor shall furnish the Engineer a Certificate of Compliance in accordance to Section 6-1.07, "Certificates of Compliance" of the Standard Specifications for the sheet aluminum.

Sheet aluminum shall be pretreated in accordance to ASTM Designation: B449. Surface of the sheet aluminum shall be cleaned, deoxidized, and coated with a light and tightly adherent chromate conversion coating free of powdery residue. The conversion coating shall be Class 2 with a mass between 108 mg/m^2 and 377 mg/m^2, and an average mass of 269 mg/m^2. Following the cleaning and coating process, the sheet aluminum shall be protected from exposure to grease, oils, dust, and contaminants.

Sheet aluminum shall be free of buckles, warps, dents, cockles, burrs, and defects resulting from fabrication.

Base plate for standard route marker shall be die cut.

RETROREFLECTIVE SHEETING

The Contractor shall furnish retroreflective sheeting for sign background and legend in accordance with ASTM Designation: D4956 and "Prequalified and Tested Signing and Delineation Materials" of these Special Provisions.

Retroreflective sheeting shall be applied to sign panels as recommended by the retroreflective sheeting manufacturer without stretching, tearing, and damage.

Class 1, 3, or 4 adhesive backing shall be used for Type II, III, IV, VII, VIII, and IX retroreflective sheeting. Class 2 adhesive backing may also be used for Type II retroreflective sheeting. The adhesive backing shall be pressure sensitive and fungus resistant.

When the color of the retroreflective sheeting determined from instrumental testing is in dispute, the Engineer's visual test will govern.

PROCESS COLOR AND FILM

The Contractor shall furnish and apply screened process color, non-reflective opaque black film, and protective overlay film of the type, kind, and product that are approved by the manufacturer of the retroreflective sheeting.

The Contractor shall furnish the Engineer a Certificate of Compliance in accordance to Section 6-1.07, "Certificates of Compliance" of the Standard Specifications for the screened process color, non-reflective opaque black film, and protective overlay film.

The surface of the screened process color shall be flat and smooth. When the screened process colors determined from the instrumental testing in accordance to ASTM Designation: D4956 are in dispute, the Engineer's visual test will govern.

The Contractor shall provide patterns, layouts, and set-ups necessary for the screened process.

The Contractor may use green, red, blue, and brown reverse-screened process colors for background and non-reflective opaque black film or black screened process color for legend. The coefficient of retroreflection for reverse-screened process colors on white retroreflective sheeting shall not be less than 70 percent of the coefficient of retroreflection specified in ASTM Designation: D4956.

The screened process colors and non-reflective opaque black film shall have the same outdoor weatherability as that of the retroreflective sheeting.

After curing, screened process colors shall withstand removal when tested by applying 3M Company Scotch Brand Cellophane Tape No. 600 or equivalent tape over the color and removing with one quick motion at 90°angle.

SINGLE SHEET ALUMINUM SIGN

Single Sheet aluminum signs shall be fabricated and furnished with or without frame. The Contractor shall furnish the sheet aluminum in accordance to "Sheet Aluminum" of these Special Provisions. Single sheet aluminum signs shall be fabricated from sheet aluminum alloy 6061-T6 or 5052-H38.

Single Sheet aluminum signs shall not have a vertical splice in the sheet aluminum. For signs with depth greater than 1220-mm, one horizontal splice will be allowed in the sheet aluminum.

Framing for single sheet aluminum sign shall consist of aluminum channel or rectangular aluminum tubing. The framing shall have a length tolerance of $\pm$3-mm. The face sheet shall be affixed to the frame with rivets of 5-mm diameter. Rivets shall be placed within the web of channels and shall not be placed less than 13-mm from edges of the sign

panels. Rivets shall be made of aluminum alloy 5052 and shall be anodized or treated with conversion coating to prevent corrosion. The exposed portion of rivets on the face of signs shall be the same color as the background or legend where the rivets are placed.

Finished signs shall be flat within a tolerance of ±3-mm per meter when measured across the plane of the sign in all directions. The finished signs shall have an overall tolerance within ±3-mm of the detailed dimensions.

Aluminum channels or rectangular aluminum tubings shall be welded together with the inert gas shielded-arc welding process using E4043 aluminum electrode filler wires as shown on the plans. Width of the filler shall be equal to wall thickness of smallest welded channel or tubing.

FIBERGLASS REINFORCED PLASTIC PANEL SIGN

The Contractor shall furnish fiberglass reinforced plastic panel sign in accordance with ASTM Designation: D3841 and "Prequalified and Tested Signing and Delineation Materials" of these Special Provisions.

Fiberglass reinforced plastic shall be acrylic modified and ultraviolet stabilized for outdoor weatherability. The plastic shall contain additives designed to suppress fire ignition and flame propagation. When tested in accordance with the requirements in the ASTM Designation: D635, the extent of burning shall not exceed 25-mm.

Fiberglass reinforced plastic shall be stabilized to prevent the release solvents and monomers. The front and back surfaces of the laminate shall be clean and free of constituents and releasing agents that can interfere with the bonding of retroreflective sheeting.

The fiberglass reinforced plastic panel sign shall be weather resistant Grade II thermoset polyester laminate.

The fiberglass reinforced plastic panels shall be minimum 3.4-mm thick. Finished fiberglass reinforced plastic panel signs shall be flat within a tolerance of ±3-mm per meter when measured across the plane of the sign in all directions. The finished signs shall have an overall tolerance within ±3-mm of the specified dimensions.

Color of fiberglass reinforced plastic panels shall be uniform gray within Munsel range of N7.5 to N8.5.

Fiberglass reinforced plastic panels shall be cut from a single piece of laminate. Bolt holes shall be predrilled. The predrilled bolt holes, panel edges, and the front and back surfaces of the panels shall be true and smooth. The panel surfaces shall be free of visible cracks, pinholes, foreign inclusions, warping and wrinkles that can affect performance and serviceability.

LAMINATED PANEL SIGN

Laminated panel signs shall consist of two sheet aluminum laminated to a honeycomb core and extruded aluminum frame to produce flat and rigid panels of 25.4-mm or 63.5-mm nominal thickness.

The face of laminated panel signs shall be fabricated from sheet aluminum alloy 6061-T6 or 5052-H32 of 1.6-mm thickness. The back of laminated panel signs shall be fabricated from sheet aluminum alloy 3003-H14 of 1.0-mm thickness. The Contractor shall furnish sheet aluminum as provided in "Sheet Aluminum" of these Special Provisions.

The core material shall be phenolic impregnated kraft paper honeycomb and fungus resistant in accordance to Military Specification MIL-D-5272. The honeycomb cell size shall be 13-mm. Weight of the kraft paper shall be 300 g/m^2 and impregnated minimum 18 percent by weight.

A laminating adhesive that can produce a resilient oil and water-resistant bond shall be used to adhere the extruded aluminum frame and the honeycomb core to the sheet aluminum. Edge and interior delamination occur when a 0.25-mm thick feeler gauge of 13-mm in length can be inserted into a depth of more than 13-mm between the extruded aluminum frame and the sheet aluminum. Laminated panel sign with delamination will be rejected.

Laminated panels shall be able to resist a wind load of 161 kg/m^2 for the following simple span lengths with a bending safety factor of 1.25:

Panel Type	Nominal Panel Thickness	Simple Span Length
A	25.4-mm	2.7 m
B	25.4-mm	2.7 m
	63.5-mm	4.42 m
H	63.5-mm	4.42 m

The tensile strength of laminated panels shall be at least 138 kPa when tested in accordance with the following modification and with ASTM Designations: C297 and C481, Cycle B after aging. Instead of spraying with hot water, the specimen shall be totally immersed in 70°C hot water. When requested by the Engineer or the Transportation Laboratory, at least one test sample of 300-mm x 300-mm in size shall be taken for every 186 m^2 of the panel production cycle or of the total factory production order, whichever occurs first.

Rivets used to secure the sheet aluminum to the perimeter frame shall be fabricated from aluminum alloy 5052 and annodized or treated with a conversion coating to prevent corrosion. Size of the aluminum rivets shall be 5-mm in diameter and placed at the corners of the laminated panels. Color of the exposed portion of the rivets shall be the same color as the sign background or legend on which the rivets are placed. Rivets or stainless steel screws shall be placed in holes drilled during fabrication in the perimeter frame.

On laminated multiple panel signs, a closure H-Section shall be placed in the top channel of the bottom panel. Perimeter frame of adjoining panel shall accommodate the closure H-Section in the closed position.

For signs with a depth of 1524-mm or less, the laminated panels shall be fabricated with no horizontal joints, splices or seams. For signs with a depth of greater than 1524-mm, the laminated panels may be fabricated in two panels.

The face of laminated panels shall be flat with a tolerance of $\pm$8-mm per meter when measured across the plane of each panel in all directions. Where laminated panels adjoin, the gap between adjoining edges from one corner to the other corner shall not deviate by more than 1-mm. Non-adjoining edges from one corner to the other corner shall not deviate by more than 3-mm from a straight plane. The front and back sheet aluminum shall be flush with the perimeter frame. The panel edges shall be smooth.

Laminated panel signs shall be within +3-mm or -13-mm of the detailed dimensions. The difference in length between adjoining panels of multiple panel signs shall not be greater than 13-mm.

Roadside laminated panel signs shall be Type B. Type B panels shall have a nominal thickness of 25.4-mm or 63.5-mm.

The perimeter frame of Type B panels shall consist of extruded channel edges. The interior and exterior sides of the channels, except the sides touching the face and back sheet aluminum, shall be welded at the joint. Sealant shall be placed at the corners of the perimeter frame to prevent moisture penetration.

Each side of the vertical tube spacers of Type B panels shall be welded to the perimeter frame, except the sides touching the front and back sheet aluminum.

The Contractor shall furnish mounting hardware for roadside laminated panel signs, such as closure H-sections, lags, bolts, nuts, and washers.

Overhead laminated panel signs shall be Type A and have a nominal thickness of 25.4-mm.

For overhead laminated signs with a length of 7315-mm or less, the laminated panels shall be fabricated with no vertical joints, splices or seams. For signs with a length of greater than 7315-mm, the length of each adjoining panel shall be as determined by the Engineer or as shown on the plans.

The perimeter frame of Type A overhead laminated panels shall be connected by self-tapping hex head stainless steel screws. Sealant shall be placed at the corners of the perimeter frame to prevent moisture penetration. The perimeter frame of Type A panels shall consist of extruded channel edges on the vertical sides and consist of modified "H" section extrusion on the horizontal sides. The modified "H" section extrusion acts as an integral retainer track for affixing the bolts to provide blind fastening of panels to the structure support.

The Contractor shall furnish mounting hardware for overhead laminated panel signs, such as closure H-sections, clamps, bolts, nuts, and washers. The clamps shall be cast aluminum alloy with a minimum tensile strength of 170 MPa. Bolt torque used for installing clamps shall not exceed 12 N-m.

MEASUREMENT AND PAYMENT

Furnishing signs (except for construction area signs) will be measured by the square meter and the quantity to be paid for will be the total area, in square meters, of the sign panel types installed in place.

The contract price paid per square meter for Furnish Sign of the types specified in the Engineer's estimate shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in fabricating and furnishing the signs, including fastening hardware, as shown on the plans, as specified in the Standard Specifications and these Special Provisions, and as directed by the Engineer.

Full compensation for furnishing and installing protective overlay on signs shall be considered as included in the contract price paid per square meter for Furnish Sign of the various types and no separate payment will be made therefor.

10-1.98 ALTERNATIVE PIPE:

Alternative pipe culverts must comply with Section 62, "Alternative Culverts" of the Standard Specifications.

Concrete backfill for alternative culverts shall be constructed in conformance with the provisions in Section 66-1.045, "Concrete Backfill" of the Standard Specifications and will be measured and paid for in conformance with the provisions in Section 66-4, "Measurement and Payment" of the Standard Specifications and the following:

A. The quantity of concrete backfill to be paid for, regardless of the kind of culvert and wall thickness of the culvert installed, will be based on the dimensions shown on the plans and the installation of corrugated steel pipe, except that when reinforced concrete pipe is designated as the only kind of culvert allowed for the installation of an alternative culvert, the quantity of concrete backfill to be paid for at that installation, regardless of the kind of culvert and wall thickness of the culvert installed, will be based on the dimensions shown on the plans and the installation of reinforced concrete pipe with the least wall thickness shown in AASHTO Designation: M 170M for the Class of pipe designated.

The contract unit prices paid per meter for Alternative Pipe Culvert of the types specified in the Engineer's estimate shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved including structure excavation and backfill, the furnishing and placing of concrete backfill if necessary, as shown on the plans, as specified in the Standard Specifications and these Special Provisions, and as directed by the Engineer.

10-1.99 REINFORCED CONCRETE PIPE:

Reinforced concrete pipe shall conform to the provisions in Section 65, "Reinforced Concrete Pipe" of the Standard Specifications and these Special Provisions.

GENERAL

Where embankment will not be placed over the top of the pipe, a relative compaction of not less than 85 percent shall be required below the pipe spring line for pipe installed using Method 1 backfill in trench, as shown on Standard Plan A62D. Where the pipe is to be placed under the traveled way, a relative compaction of not less than 90 percent shall be required unless the minimum distance between the top of the pipe and the pavement surface is the greater of 1.2 meters or one half of the outside diameter of the pipe.

Except as otherwise designated by classification on the plans or in the specifications, joints for culvert and drainage pipes shall conform to the plans or specifications for standard joints.

When reinforced concrete pipe is installed in conformance with the details shown on Standard Plan A62DA, the fifth paragraph of Section 19-3.04, "Water Control and Foundation Treatment" of the Standard Specifications shall not apply.

When solid rock or other unyielding material is encountered at the planned elevation of the bottom of the bedding, shown on Standard Plan A62DA, the material below the bottom of the bedding shall be removed to a depth of 1/50 of the height of the embankment over the top of the culvert, but not less than 150-mm nor more than 300-mm. The resulting trench below the bottom of the bedding shall be backfilled with structure backfill material in conformance with the provisions in Section 19-3.06, "Structure Backfill" of the Standard Specifications. The Outer Bedding shall not be compacted prior to placement of the pipe.

The concrete for reinforced concrete pipe must contain not less than 308 kg of cementitious material per cubic meter with a water–cementitious material ratio not to exceed 0.35 by weight. Reinforcement shall have a minimum cover of 31-mm. Supplementary cementitious material is optional.

Special reinforced concrete pipe, having concrete cover over the steel reinforcement greater than the cover specified in AASHTO Designation: M 170M, shall conform to the provisions in Section 65-1.02, "Materials" and Section 65-1.02A, "Circular Reinforced Concrete Pipe" of the Standard Specifications, except the width of crack produced by the D-load test specified in AASHTO Designation: M 170M shall be the width determined by the following formula:

$$b = \frac{t - 3/8d}{t - 3/8d - C} \times 0.3\text{-mm}$$

Where:

b = Width of crack to be produced in lieu of the 0.3-mm crack specified in AASHTO Designation: M 170M.
t = Wall thickness of pipe, mm.
d = Effective depth of the section to be tested, m.
C = Concrete cover over steel reinforcement in excess of cover specified in AASHTO Designation: M 170M.

Reinforced concrete pipe that is to be hydrostatically tested shall be strength tested by the 3-edge bearing method to a maximum D-load of 10 percent greater than the 0.3-mm cracking D-load specified in AASHTO Designation: M 170M or to the actual D-load required to produce a 0.3-mm crack, whichever is the lesser.

Special oval shaped reinforced concrete pipe, having concrete cover over the steel reinforcement greater than the cover specified in AASHTO Designation: M 207M, shall conform to the provisions in Section 65-1.02, "Materials" and Section 65-1.02B, "Oval Shaped Reinforced Concrete Pipe" of the Standard Specifications, except the width of crack produced by the D-load test specified in AASHTO Designation: M 207M shall be the width determined by the following formula:

$$b = \frac{t - 3/8d}{t - 3/8d - C} \times 0.3\text{-mm}$$

Where:
b = Width of crack to be produced in lieu of the 0.3-mm crack specified in AASHTO Designation: M 207M.
t = Wall thickness of pipe, mm.
d = Effective depth of the section to be tested, m.
C = Concrete cover over steel reinforcement in excess of cover specified in AASHTO Designation: M 207.

Oval shaped reinforced concrete pipe that is to be hydrostatically tested shall be strength tested by the 3-edge bearing method to a maximum D-load of 10 percent greater than the 0.3-mm cracking D-load specified in AASHTO Designation: M 207M or to the actual D-load required to produce a 0.3-mm crack, whichever is the lesser.

The excavation and backfill below the planned elevation of the bottom of the bedding shown on Standard Plan A62DA will be paid for as extra work as provided in Section 4-1.03D, "Extra Work" of the Standard Specifications.

Portland cement for concrete backfill shall be Type III conforming to the provisions in Section 90-2.01A, "Cement" of the Standard Specifications. A Type C accelerating admixture conforming to the requirements in ASTM Designation: C 494 shall be added to the concrete mix for concrete backfill. The admixture shall be used at the rate recommended by the manufacturer of the admixture. The admixture shall not contain chlorides as Cl in excess of one percent by mass as determined by California Test 415.

Reinforced concrete pipe shall be either cast or spun. Cast reinforced concrete pipe shall be manufactured by placing the concrete into stationary, vertical, cylindrical metal forms. Spun reinforced concrete pipe shall be manufactured by introducing the concrete into a rotating, horizontal, cylindrical metal form.

PAYMENT

The contract unit price paid per meter for Reinforced Concrete Pipe shall include full compensation for furnishing all labor, tools, materials, equipment and for doing all work involved and complete in place including excavation and backfill, and no additional compensation will be allowed therefor.

10-1.100 CORRUGATED METAL PIPE:

Corrugated Steel Pipe culverts shall conform to the provisions in Section 66, "Corrugated Metal Pipe" of the Standard Specifications and these Special Provisions.

Asphaltic mastic coating or polymeric sheet coating substituted for bituminous coating shall be placed on the outside and inside surfaces of the pipe.

Corrugated steel pipe shall be fabricated from zinc-coated steel sheet.

Portland cement for concrete backfill shall be Type III conforming to the provisions in Section 90-2.01A, "Cement" of the Standard Specifications. A Type C accelerating admixture conforming to the requirements in ASTM Designation: C 494 shall be added to the concrete mix for concrete backfill. The admixture shall be used at the rate recommended by the manufacturer of the admixture. The admixture shall not contain chlorides as Cl in excess of one percent by mass as determined by California Test 415.

Pipe reducers will be measured and paid for by the meter as the corrugated metal pipe of the larger diameter connected to the reducer.

PAYMENT

The contract unit price paid per meter for Corrugated Steel Pipe of the types as shown on the Engineer's Estimate shall include full compensation for furnishing all labor, tools, materials, equipment and for doing all work involved and complete in place including excavation and backfill, and no additional compensation will be allowed therefor.

10-1.101 OVERSIDE DRAIN:

Hot mix asphalt overside drains shall conform to the provisions in Section 69, "Overside Drains" of the Standard Specifications.

Full compensation, except as otherwise provided herein, for conforming to the requirements of this article shall conform to Hot Mix Asphalt (Miscellaneous Area) of these Special Provisions.

10-1.102 WELDED STEEL PIPE CASING (BRIDGE):

Welded steel pipe casings through bridges and under approach slabs shall be of the size shown and shall conform to the provisions in Section 70, "Miscellaneous Facilities" of the Standard Specifications and these Special Provisions.

Unless otherwise shown on the project plans, casings shall be installed at each abutment, and casings shall be extended to the greater of: (1) 1.5 meters beyond the approach slab, (2) 1.5 meters beyond the end of the adjacent wingwall, or (3) 6 meters beyond the abutment.

WORKING DRAWINGS

Working drawings for temporary support of casing pipe at the abutments shall be submitted for approval in conformance with the provisions in Section 5-1.02, "Plans and Working Drawings" of the Standard Specifications.

MATERIALS

Casing Pipe

Casing pipe shall be welded steel pipe conforming to the provisions in Section 70-1.02B, "Welded Steel Pipe" of the Standard Specifications, except that the pipe shall be treated in accordance with the following requirements, prior to shipping. Exterior surfaces of welded steel pipe shall be cleaned and coated in conformance with the requirements in ANSI/AWWA C213 or at the option of the Contractor, cleaned, primed, and coated in accordance with specifications of ANSI/AWWA C214.

Pipe Wrapping Tape

Wrapping tapes for pipe in contact with the ground shall be a pressure sensitive polyvinyl chloride or polyethylene tape having thickness of 1.27-mm, minimum.

CONSTRUCTION

If a blockout is provided in the bridge abutment wall for casing pipe, the space between the casing pipe and bridge abutment wall shall be filled with mortar conforming to the provisions in Section 51-1.135,"Mortar" of the Standard Specifications.

Openings for utilities through bridge superstructure concrete shall either be formed or shall consist of pipe sleeves.

Wrapping and Coating Pipe

Damaged coating on steel pipe casing in contact with earth shall be wrapped as follows:

A. Pipe to be wrapped shall be thoroughly cleaned and primed as recommended by the tape manufacturer.

B. Tapes shall be tightly applied with 1/2 uniform lap, free from wrinkles and voids to provide not less than a 2.54-mm thickness.
C. Field joints and fittings for wrapped pipe shall be covered by double wrapping 1.27mm thick tape. Wrapping at joints shall extend a minimum of 6 inches over adjacent pipe coverings. Width of tape for wrapping fittings shall not exceed 51-mm. Adequate tension shall be applied so tape will conform closely to contours of joint.

Where a welded steel pipe casing passes through the abutment wall, the welded steel pipe casing shall be additionally wrapped with 2 layers of 6.8kg asphalt-felt building paper, securely taped or wired in place.

MEASUREMENT AND PAYMENT

Measurement and payment for Welded Steel Pipe Casing (Bridge) for each size listed in the Engineers Estimate shall conform to the provisions in Sections 70-1.04, "Measurement" and 70-1.05, "Payment" of the Standard Specifications.

Full compensation for furnishing and installing mortar and building paper, and casing, shall be considered as included in the contract prices paid per linear foot for the sizes of welded steel pipe casing (bridge) involved, and no additional compensation will be allowed therefor.

10-1.103 ROCK SLOPE PROTECTION:

Slope protection shall be placed or constructed in conformance with the provisions in Section 72, "Slope Protection" of the Standard Specifications.

The contract unit price paid per cubic meter for Rock Slope Protection of the type listed in the Engineer's Estimate shall include full compensation for furnishing all labor, tools, materials, equipment and for doing all work involved and complete in place including excavation and backfill, and no additional compensation will be allowed therefor.

Rock slope protection fabric shall be woven or nonwoven type fabric, Type A or Type B, at the option of the Contractor.

10-1.104 SLOPE PAVING:

Slopes under the ends of bridges, where shown on the plans, shall be paved in conformance with the provisions in Section 72-6, "Slope Paving" of the Standard Specifications and these Special Provisions.

The location of construction joints shall be subject to the approval of the Engineer. Placement of slope paving shall be scheduled so that the work, including placement, finishing, and application of curing, is completed in any section bounded by permissible construction joints on the same day that the work is started in that section.

Areas of slope paving shown on the plans to have a stiff broom finish shall be scored by dragging a finishing tool over the struck-off surface or by any other means which will result in a surface conforming to the details shown on the plans.

Prior to placing the permanent slope paving, the Contractor shall construct a test panel at least 1.2 m by 1.8 m at the site for approval by the Engineer. The test panel shall be constructed of the same materials as are proposed for the permanent work and shall be finished and cured as specified for the permanent work. Additional test panels shall be constructed as necessary until panel is produced which conforms to the requirements herein, before constructing other slope paving.

10-1.105 MISCELLANEOUS CONCRETE CONSTRUCTION:

Minor Concrete (Colored), Minor Concrete (Sidewalk), Minor Concrete (Textured Paving), and Minor Concrete (Curb and Gutter) shall conform to the provisions in Section 73, "Concrete Curbs and Sidewalks" of the Standard Specifications and these Special Provisions.

Preparation of subgrade for the concrete structures shall be done in conformance with the requirements of Section 73-1.02 of the Standard Specifications.

Excess material resulting from the excavation of the subgrade shall be disposed of as elsewhere provided in these Special Specifications.

Construction of sidewalk and shall include, but not be limited to, the following:

1) Removal and disposal of existing sidewalk, curb, and/or curb and gutter and existing soil and aggregate as required;
2) Remove the gravel behind the new sidewalk and re-grade;
3) Establishing grades, and assuring that all grades are met;
4) Performing all grading and compaction – including all required aggregate import, as directed by the Engineer;
5) Construction of new sidewalk, curb, and/or curb and gutter;
6) All scoring/grooving and required saw cutting;
7) Repair of existing asphalt and PCC surfacing;
8) Installing 1/2" wide expansion joints;
9) All landscaping, and related work, to return the area adjacent to the curb ramp to its original condition and to conform the area to the new improvements;

The area behind and along the sidewalk shall be filled and compacted with native or select material and graded to match and provide a smooth transition from the back of sidewalk, to the satisfaction of the Engineer.

Curb ramp detectable warning surface shall consist of raised truncated domes constructed or installed on curb ramps in conformance with the details shown on the plans and these Special Provisions. At the option of the Contractor, the detectable warning surface shall be prefabricated, cast-in-place, or stamped into the surface of the curb ramp. The color of the

detectable warning surface shall be yellow conforming to Federal Standard 595B, Color No. 33538.

Prefabricated detectable warning surface shall be in conformance with the requirements established by the Department of General Services, Division of State Architect and be attached in conformance with the manufacturer's recommendations.

Cast-in-place and stamped detectable warning surfaces shall be painted in conformance with the provisions in Section 59-6, "Painting Concrete" of the Standard Specifications. The finished surfaces of the detectable warning surface shall be free from blemishes.

Prior to constructing the cast-in-place or stamping the detectable warning surface, the Contractor shall demonstrate the ability to produce a detectable warning surface conforming to the details shown on the plans and these Special Provisions by constructing a 600-mm by 600-mm test panel.

The manufacturer shall provide a written 5-year warranty for prefabricated detectable warning surfaces, guaranteeing replacement when there is defect in the dome shape, color fastness, sound-on-cane acoustic quality, resilience, or attachment. The warranty period shall begin upon acceptance of the contract.

Full compensation for constructing or furnishing and installing curb ramp detectable warning surfaces shall be considered as included in the contract price paid per cubic meter for Minor Concrete (Sidewalk) and no separate payment will be made therefor.

PAYMENT

The contract unit bid prices paid per cubic meter for Minor Concrete (Curb And Gutter) and Minor Concrete (Sidewalk), per square meter for Minor Concrete (Colored) and Minor Concrete (Textured Paving) shall include full compensation for furnishing all labor, tools, materials, equipment and for doing all work involved and complete in place, and no additional compensation will be allowed therefor.

10-1.106 MISCELLANEOUS IRON AND STEEL:

Miscellaneous iron and steel shall conform to the provisions in Section 75, "Miscellaneous Metal" of the Standard Specifications.

The contract unit price paid per kilogram for Miscellaneous Iron And Steel shall include full compensation for furnishing all labor, tools, materials, equipment and for doing all work involved and complete in place, and no additional compensation will be allowed therefor.

10-1.107 SCRIPT LETTERS (RAILING MOUNTED):

Metal script letters (railing mounted) including steel support beams and angle brackets shall conform to the provisions for miscellaneous bridge metal in Section 75, "Miscellaneous Metal" of the Standard Specifications and these Special Provisions.

Attention is directed to "Welding" of these Special Provisions.

Metal script letters (railing mounted) shall consist of the miscellaneous bridge metal items listed in Section 75-1.03, "Miscellaneous Bridge Metal" of the Standard Specifications, and the following:

A. Full thread welded studs.
B. Stainless steel plates.

Full thread welded studs shall conform to the requirements in ASTM Designation: A 108.

Stainless steel shall conform to the requirements in ASTM Designation: A 666 for Type 304 L stainless steel sheet. The final finish of the stainless steel shall be No. 3 – coarse abrasive finish applied mechanically.

Welding on stainless steel shall conform to the requirements in AWS D1.6. Electrodes shall conform to the requirements in AWS A5.9 for ER309(L) chromium-nickel bare arc welding electrodes

The exposed cut edges of stainless steel shall be ground or brushed to a 0.6-μm to 1.3-μm finish using iron-free abrasives or stainless steel brushes.

PRECONSTRUCTION SAMPLE

Prior to constructing the metal script letters (railing mounted), the Contractor shall furnish the Engineer 2 sample stainless steel plates at least 0.3 m x 0.3 m in size. The sample stainless steel plates shall be fabricated and finished with the materials, tools, equipment and methods to be used in fabricating the metal script letters. If ordered by the Engineer, additional sample panels shall be fabricated and furnished until the specified finish is obtained, as determined by the Engineer.

The sample stainless steel plates approved by the Engineer shall be used as the standard of comparison in determining acceptability of metal script letters to be mounted on the railing.

MEASUREMENT AND PAYMENT

The contract lump sum price paid for metal Script Letters (Railing Mounted) shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in fabricating and constructing metal script letters, complete in place, including steel support beams, angle steel brackets, painting, and

furnishing sample stainless steel plates, as shown on the plans, as specified in the Standard Specifications and these Special Provisions, and as directed by the Engineer.

10-1.108 BRIDGE DECK DRAINAGE SYSTEM:

Bridge deck drainage systems shall conform to the provisions for miscellaneous bridge metal in Section 75, "Miscellaneous Metal" of the Standard Specifications and these Special Provisions.

Self-tapping screws used for sleeve connections shall be hex-head stainless steel, installed in holes drilled to fit the self-tapping screws, conforming to the requirements of ASTM Designation: A 276, Type 304.

At the Contractor's option, fiberglass pipes and fittings with the same diameter and minimum bend radius as those shown on the plans, may be substituted for welded steel pipe in deck drain systems.

Fiberglass pipe and fittings shall conform to the requirements in ASTM Designation: D 2996, and shall have a minimum short-term rupture strength of 207 MPa. The adhesive type recommended by the manufacturer shall be used for joining pipe and fittings. Fiberglass pipe not enclosed in a box girder cell or encased in concrete shall be manufactured from ultraviolet-resistant resin pigmented with concrete-gray color, or be coated with a concrete-gray resin-rich exterior coating. Paint shall not be used. Fiberglass pipe treated with ultraviolet protection shall withstand a minimum of 2500 hours of accelerated weathering when tested in conformance with the requirements in ASTM Designation: G 154. Lamps shall be UV-B (313 nm wavelength). The resting cycle shall be 4 hours of ultraviolet exposure at 60°C, and then 4 hours of condensate exposure at 50°C. After testing, the surface of the pipe shall exhibit no fiber exposure, crazing, or checking, and only a slight chalking or color change.

Support spacing for fiberglass pipe shall be the same as shown on the plans for welded steel pipe. Pipe supports shall have a width of not less than 38-mm.

A Certificate of Compliance for fiberglass pipe and fittings shall be furnished to the Engineer in conformance with the provisions in Section 6-1.07, "Certificates of Compliance" of the Standard Specifications. The Certificate of Compliance shall include all laboratory test results conforming to the provisions specified herein.

For drainage piping NPS 8 or smaller, which is: (1) enclosed in a box girder cell and exposed for a length not greater than 6 m within the cell, or (2) encased in concrete, the Contractor shall have the option of substituting polyvinyl chloride (PVC) plastic pipe and fittings, with the same diameter and minimum bend radius as shown on the plans, for welded steel pipe.

The PVC plastic pipe and fittings shall be Schedule 40 conforming to the requirements of ASTM Designations: D 1785. The maximum support spacing for PVC plastic pipe shall be 2 m.

Couplings used to connect PVC plastic pipe or fiberglass pipe to steel shall be threaded or flanged. The sleeve connections shown on the plans shall not be used for either PVC plastic pipe or fiberglass pipe.

If PVC plastic pipe or fiberglass pipe is substituted for welded steel pipe, the quantity of drainage piping will be computed on the basis of the dimensions and details shown on the plans, and no change in the quantities to be paid for will be made because of the use of PVC plastic pipe or fiberglass pipe.

Bridge deck drainage systems will be measured and paid for by the kilogram in the same manner specified for miscellaneous metal (bridge) in Section 75-1.06, "Measurement" and Section 75-1.07, "Payment" of the Standard Specifications.

10-1.109 CHAIN LINK FENCE:

Chain link fence shall be Type CL-1.8 and shall conform to the provisions in Section 80, "Fences" of the Standard Specifications.

The contract unit price paid per meter for Chain Link Fence (Type CL-1.8) shall include full compensation for furnishing all labor, tools, materials, equipment, and incidentals, and for doing all work involved and complete in place including excavation and backfilling with concrete, and no additional compensation will be allowed therefor.

10-1.110 MARKERS AND DELINEATORS:

Markers and delineators shall conform to the provisions in Section 82, "Markers and Delineators" of the Standard Specifications and these Special Provisions.

Markers and delineators on flexible posts shall conform to the provisions in "Prequalified and Tested Signing and Delineation Materials" of these Special Provisions. Flexible posts shall be made from a flexible white plastic which shall be resistant to impact, ultraviolet light, ozone, and hydrocarbons. Flexible posts shall resist stiffening with age and shall be free of burns, discoloration, contamination, and other objectionable marks or defects which affect appearance or serviceability.

Retroreflective sheeting for metal and flexible target plates shall be the retroreflective sheeting designated for channelizers, markers, and delineators conforming to the requirements in ASTM Designation: D 4956-95 and in conformance with the provisions in "Prequalified and Tested Signing and Delineation Materials" of these Special Provisions.

The contract unit price paid per each for Delineator of the types as shown in the Engineer's Estimate shall include full compensation for furnishing all labor, tools, materials, equipment and for doing all work involved and complete in place as directed by the Engineer, and no additional compensation will be allowed therefor.

10-1.111 METAL BEAM GUARD RAILING:

Metal beam guard railing shall be constructed in conformance with the provisions in Section 83-1, "Railings" of the Standard Specifications and these Special Provisions.

Line posts shall be wood, steel, or plastic. Blocks shall be wood or plastic.

The contract unit price paid per meter for Metal Beam Guard Railing shall include full compensation for furnishing all labor, tools, materials, equipment and for doing all work involved and complete in place including excavation and backfilling with concrete as directed by the Engineer, and no additional compensation will be allowed therefor.

ALTERNATIVE FLARED TERMINAL SYSTEM

Alternative flared terminal system shall be furnished and installed as shown on the plans and in conformance with these Special Provisions.

The allowable alternatives for a flared terminal system shall consist of one of the following or a Department approved equal.

(1) TERMINAL SYSTEM (TYPE FLEAT) - Terminal system (Type FLEAT) shall be a Flared Energy Absorbing Terminal 350 manufactured by Road Systems, Inc., located in Big Spring, Texas, and shall include items detailed for terminal system (Type FLEAT) shown on the plans. The Flared Energy Absorbing Terminal 350 can be obtained from the distributor, Universal Industrial Sales, P.O. Box 699, Pleasant Grove, UT 84062, Telephone (801) 785–0505 or from the distributor, Gregory Highway Products, 4100 13th Street, S.W., Canton, OH 44708, Telephone (330) 477–4800.

(2) TERMINAL SYSTEM (TYPE SRT) - Terminal system (Type SRT) shall be an SRT-350 Slotted Rail Terminal (8-post system) as manufactured by Trinity Industries, Inc., and shall include items detailed for terminal system (Type SRT) shown on the plans. The SRT-350 Slotted Rail Terminal (8-post system) can be obtained from the manufacturer, Trinity Industries, Inc., P.O. Box 99, 950 West 400S, Centerville, UT 84014, Telephone (800) 772–7976.

The Contractor shall provide the Engineer with a Certificate of Compliance from the manufacturer in conformance with the provisions in Section 6-1.07, "Certificates of Compliance" of the Standard Specifications. The Certificate of Compliance shall certify that the terminal systems furnished conform to the contract plans and specifications, conform to the pre-qualified design and material requirements, and were manufactured in conformance with the approved quality control program.

Terminal systems shall be installed in conformance with the manufacturer's installation instructions and these requirements. Each terminal system installed shall be identified by painting the type of terminal system in neat black letters and figures 60-mm high on the backside of the rail element between system posts numbers 4 and 5.

For terminal system (Type SRT), the steel foundation tubes with soil plates attached shall be, at the Contractor's option, either driven, with or without pilot holes, or placed in drilled holes. Space around the steel foundation tubes shall be backfilled with selected earth, free of rock, placed in layers approximately 100-mm thick and each layer shall be moistened and thoroughly compacted. The wood terminal posts shall be inserted into the steel foundation tubes by hand and shall not be driven. Before the wood terminal posts are inserted, the inside surfaces of the steel foundation tubes to receive the wood posts shall be coated with a grease which will not melt or run at a temperature of 65°C or less. The edges of the wood terminal posts may be slightly rounded to facilitate insertion of the post into the steel foundation tubes.

For terminal system (Type FLEAT), the soil tubes shall be, at the Contractor's option, driven with or without pilot holes, or placed in drilled holes. Space around the steel foundation tubes shall be backfilled with selected earth, free of rock, placed in layers approximately 100-mm thick and each layer shall be moistened and thoroughly compacted. Wood posts shall be inserted into the steel foundation tubes by hand. Before the wood terminal posts are inserted, the inside surfaces of the steel foundation tubes to receive the wood posts shall be coated with a grease which will not melt or run at a temperature of 65°C or less. The edges of the wood posts may be slightly rounded to facilitate insertion of the post into the steel foundation tubes.

Surplus excavated material remaining after the terminal system has been installed shall be disposed of in a uniform manner along the adjacent roadway where designated by the Engineer.

The contract unit price paid per each for Alternative Flared Terminal System shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in furnishing and installing alternative flared terminal system, complete in place, including excavation, backfill and disposal of surplus material, as shown on the plans, as specified in the Standard Specifications and these Special Provisions, and as directed by the Engineer.

10-1.112 MINI MESH CHAIN LINK RAILING:

Mini mesh chain link fabric shall be 11-gage (3.05-mm), Class 2B, fuse bonded vinyl coated fabric, conforming to the requirements in ASTM Designation: F 668.

All chain link fabric shall be woven into approximately 16-mm mesh.

The color of vinyl coated mini mesh chain link fabric shall be dark brown conforming to Color No. 30160 of the Federal Standard No. 595B. Th color representative of the desired tone and hue. The final color is to be determined by the Engineer from sample coated mesh panels furnished by the Contractor. All frame metal, cable, tension wire, wire ties and other fittings shall be powder coated to match the color of the mesh.

Self-tapping screws used for securing chain link fabric shall be hex-head stainless steel, installed in holes drilled to fit the self-tapping screws, conforming to the requirements of ASTM Designation: A 276, Type 304.

POWDER COATING

All galvanized frame metal, fittings and hardware shall be coated with a TGIC (Triglycidyl Isocyanurate) polyester powder coat that is electrostatically applied and physically bonded to the metal surface.

Prior to applying the powder coat on the galvanized metal surface, the metal surface shall be thoroughly pretreated to remove unsuitable materials including, but not limited to, oils, greases, chcmical slats and zinc corrosion products.

The total dry film thickness of TGIC polyester powder coating applied to all exterior surfaces shall be not less than 100 μm.

The TGIC polyester powder coating shall be formulated for application to galvanized coating and zinc-rich primer, and shall conform to the following:

A.

Property	Value	Test Method
Impact	Pass 0.90 kilogram-meters	ASTM D 2794
Flexibility	Pass 3.2 mm mandrel	ASTM D 522
Pencil Hardness	H-2H	ASTM D 3363
Adhesion	Minimum rating 4B	ASTM D 3359B

B. No visible color change in the powder coating shall occur when tested in conformance with the requirements in ASTM Designation: G 53 using FS 40 UV-B bulbs for a minimum of 38 cycles. The cycle shall be 4 hours of ultraviolet (UV) exposure at 60° C and 4 hours of condensate exposure at 40° C.

The powder coating color shall match the color of vinyl coated mini mesh chain link fabric.

PRECONSTRUCTION SAMPLE PANEL

Prior to constructing the mini mesh chain link fabric, the Contractor shall furnish the Engineer 4 sample coated mesh panels at least 1.0 m x 1.0 m in size. Each of the sample mesh panels shall conform to Color No. 30160 of the Federal Standard No. 595B. The sample panels shall be fabricated and finished with the materials, tools, equipment and methods to be used in fabricating the mini mesh chain link fabric. If ordered by the Engineer, additional sample panels shall be fabricated and finished until the specified finish, and color are obtained, as determined by the Engineer.

The sample panel approved by the Engineer shall be used as the standard of comparison in determining acceptability of chain link railing.

MEASUREMENT AND PAYMENT

The contract price paid per meter for Mini Mesh Chain Link Railing shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in fabricating and constructing mini mesh chain link railing, complete in place, including coating system and furnishing sample panels, as shown on the plans, as specified in the Standard Specifications and these Special Provisions, and as directed by the Engineer.

10-1.113 TUBULAR HANDRAILING:

Tubular handrailing shall conform to the provisions in Section 83-1, "Railings" of the Standard Specifications and these Special Provisions.

Exposed galvanized surfaces shall be prepared and painted in conformance with the provisions in Section 59-3, "Painting Galvanized Surfaces" of the Standard Specifications and these Special Provisions.

Exposed areas of galvanized surfaces shall receive a minimum of 2 finish coats of paint conforming to either the requirements for White Tintable Finish Paint-Waterborne, Formula PWB-164B, or an exterior grade latex paint meeting the requirements for SSPC-Paint 24, "Latex Semi-Gloss Exterior Topcoat" of the "SSPC: The Society for Protective Coatings" and conforming to the following:

A. No visible color change in the finish coats shall occur when tested in conformance with the requirements in ASTM Designation: G 53 using FS 40 UV-B bulbs for a minimum of 38 cycles. The cycle shall be 4 hours of ultraviolet (UV) exposure at 60°C and 4 hours of condensate exposure at 40°C.
B. The vehicle shall be an acrylic or modified acrylic copolymer with a minimum of necessary additives.

The total dry film thickness of all applications of the first finish coat shall be not less than 50 μm.

Except as approved by the Engineer, a minimum drying time of 12 hours shall be allowed between finish coats.

The second finish coat color shall match Federal Standard 595B, No. 30160. The total dry film thickness of all applications of the second finish coat shall be not less than 50 μm.

The 2 finish coats shall be applied in 2 or more applications to a total dry film thickness of not less than 100 μm no more than 200 μm.

10-1.114 TRANSITION RAILING (TYPE WB):

Transition railing (Type WB) shall be furnished and installed in conformance with details shown on the plans, the provisions in Section 83-2, "Barriers" of the Standard Specifications and these Special Provisions.

The 10-gage rail elements shall conform to the requirements of Class B, Type 1 thrie beam guard railing as shown in AASHTO Designation: M 180. End caps shall conform to the requirements of Class A, Type 1 thrie beam guard railing as shown in AASHTO Designation: M 180.

Surplus excavated material remaining after the transitional railing (Type WB) has been constructed shall be disposed of in a uniform manner along the adjacent roadway where designated by the Engineer.

The contract unit price paid per each for Transition Railing (Type WB) shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in furnishing and installing transition railing (Type WB), complete in place, including drilling holes for wood posts, driving posts, backfill, and disposal of surplus material, as shown on the plans, as specified in the Standard Specifications and these Special Provisions, and as directed by the Engineer.

10-1.115 CONCRETE BARRIER:

Concrete barriers shall conform to the provisions in Section 83-2, "Barriers" of the Standard Specifications and these Special Provisions.

Concrete barriers Type 26 (Mod) and Type 736 (Mod) shall conform to the provisions in Section 83-2, "Barriers" of the Standard Specifications and these Special Provisions.

Concrete barrier markers shall conform to the provisions in "Prequalified and Tested Signing and Delineation Materials" of these Special Provisions. At those locations shown on the plans, concrete barrier markers shall be cemented to the barrier in conformance with the manufacturer's recommendations.

The contract unit prices paid per meter for Concrete Barrier of the types as shown on the Engineer's Estimate shall include full compensation for furnishing all labor, tools, materials, equipment and for doing all work involved and complete in place as directed by the Engineer, and no additional compensation will be allowed therefor.

10-1.116 CRASH CUSHION (REACT):

Crash cushion (REACT) shall be furnished and installed as shown on the plans and in conformance with the provisions in the Standard Specifications and these Special Provisions.

Crash cushion (REACT) shall be a multiple recoverable type, manufactured by Energy Absorption Systems, Inc. Crash cushion (REACT) and additional components shall conform to the descriptions as follows:

Contract Item Description	Manufacturer's Product Description
Crash Cushion (REACT 9SCBS)	REACT 350.9 Self Contained

The successful bidder can obtain from the following distributors the crash cushion (REACT) manufactured by Energy Absorption Systems, Inc. at 35 East Wacker Drive, Suite 1100, Chicago, IL 60601:

A. Northern California: Traffic Control Service, Inc., 8585 Thys Court, Sacramento, CA 95828, telephone (800) 884-8274, FAX (916) 387-9734.
B. Southern California: Traffic Control Service, Inc., 1818 E. Orangethorpe, Fullerton, CA 92831-5324, telephone (800) 222-8274, FAX (714) 526-9501.

The price quoted by the manufacturer for Crash Cushion (REACT 9SCBS), FOB Pell City, Alabama is $50,000, not including sales tax.

The above prices will be firm for orders placed within 30 days of contract award, and provided delivery is accepted within 90 days after the order is placed.

The price quoted for crash cushion (REACT 9SCBS) includes the concrete anchorage devices, but does not include the concrete anchor slab or the W-Beam connection to the barrier.

Crash cushion shall be installed in conformance with the manufacturer's recommendations.

Concrete anchorage devices used for attaching the crash cushion to the base slab shall be limited to those which have been provided by the manufacturer.

The concrete anchor slab shall conform to the provisions in Section 51, "Concrete Structures" and Section 52, "Reinforcement" of the Standard Specifications and these Special Provisions.

The concrete anchor slab shall be constructed of concrete containing not less than 350 kg of cementitious material per cubic meter.

For crash cushion (REACT 9SCBS), W-Beam connections to the barrier shall conform to the provisions in Section 83-1, "Railings" of the Standard Specifications. The high strength bolts and nuts for W-Beam connections to the barrier shall conform to the requirements in ASTM Designation: A 325/A 325M and A 563/A 563M, respectively.
The Contractor shall furnish the Engineer one copy of the manufacturer's plan and parts list for each model installed.

The Contractor shall provide the Engineer with a Certificate of Compliance from the manufacturer in conformance with the provisions in Section 6-1.07, "Certificates of Compliance" of the Standard Specifications. The Certificate of Compliance shall certify

that crash cushion conforms with the contract plans and specifications, and conforms to the pre-qualified design and material requirements.

Crash cushion will be measured by the unit as determined from actual count in place in the completed work.

The contract unit price paid for crash cushion (REACT 9SCBS) shall include full compensation for furnishing all labor, materials (including anchor bolts, nuts, washers, and marker panels), tools, equipment, and incidentals, and for doing all the work involved in furnishing and installing the crash cushions, complete in place, including structure excavation, structure backfill, concrete anchor slab with bar reinforcing steel, transition plate and W-beam connector, as shown on the plans, as specified in the Standard Specifications and these Special Provisions, and as directed by the Engineer.

10-1.117 THERMOPLASTIC TRAFFIC STRIPE AND PAVEMENT MARKING:

Thermoplastic traffic stripes (traffic lines) and pavement markings shall be applied in conformance with the provisions in Section 84, "Traffic Stripes and Pavement Markings" of the Standard Specifications and these Special Provisions.

Thermoplastic material shall be free of lead and chromium, and shall conform to the requirements in State Specification PTH-02ALKYD.

Retroreflectivity of the thermoplastic traffic stripes and pavement markings shall conform to the requirements in ASTM Designation: D 6359-99. White thermoplastic traffic stripes and pavement markings shall have a minimum initial retroreflectivity of 250 $mcd \cdot m^{-2} \cdot lx^{-1}$. Yellow thermoplastic traffic stripes and pavement markings shall have a minimum initial retroreflectivity of 150 $mcd \cdot m^{-2} \cdot lx^{-1}$.

Where striping joins existing striping, as shown on the plans, the Contractor shall begin and end the transition from the existing striping pattern into or from the new striping pattern a sufficient distance to ensure continuity of the striping pattern.

Thermoplastic traffic stripes shall be applied at the minimum thickness and application rate as specified below. The minimum application rate is based on a solid stripe of 100-mm in width.

Minimum StripeThickness (mm)	Minimum Application Rate (kg/m)
2.0	0.4
2.5	0.5

Thermoplastic traffic stripes and pavement markings shall be free of runs, bubbles, craters, drag marks, stretch marks, and debris.

At the option of the Contractor, permanent traffic striping and pavement marking tape conforming to the provisions in "Prequalified and Tested Signing and Delineation Materials" of these Special Provisions may be placed instead of the thermoplastic traffic stripes and pavement markings specified herein. Permanent tape, if used, shall be installed in conformance with the manufacturer's specifications.

If permanent tape is placed instead of thermoplastic traffic stripes and pavement markings, the tape will be measured and paid for by the meter as thermoplastic traffic stripe and by the square meter as thermoplastic pavement marking.

The contract unit prices paid per meter for Thermoplastic Traffic Stripe and per square meter for Thermoplastic Pavement Marking of the types as shown on the Engineer's Estimate shall include full compensation for furnishing all labor, tools, materials, equipment, and incidentals, and for doing all the work involved as directed by the Engineer and no additional compensation will be allowed therefor.

10-1.118 PAINT TRAFFIC STRIPE:

Painted traffic stripes (traffic lines) shall be applied in conformance with the provisions in Section 84, "Traffic Stripes and Pavement Markings" of the Standard Specifications and these Special Provisions.

Traffic stripe shall conform to the requirements in State Specification No. PTWB-01.

The color of the painted traffic stripe shall conform to the requirements in ASTM Designation: D 6628-01.

Retroreflectivity of the paint traffic stripes conform to the requirements in ASTM Designation: D 6359-99. White painted traffic stripes shall have a minimum initial retroreflectivity of 250 $mcd \cdot m^{-2} \cdot lx^{-1}$. Yellow painted traffic stripes and pavement markings shall have a minimum initial retroreflectivity of 150 $mcd \cdot m^{-2} \cdot lx^{-1}$.

At the option of the Contractor, permanent traffic striping tape conforming to the provisions in "Prequalified and Tested Signing and Delineation Materials" of these Special Provisions may be placed instead of painted traffic stripes. Permanent tape, if used, shall be placed in conformance with the manufacturer's specifications.

If permanent tape is placed instead of painted traffic stripes, the tape will be measured and paid for by the meter for Paint Traffic Stripe (2-Coat).

The contract unit price paid per meter for Paint Traffic Stripe (2-Coat) shall include full compensation for furnishing all labor, tools, materials, equipment, and incidentals, and for doing all the work involved as directed by the Engineer and no additional compensation will be allowed therefor.

10-1.119 PAVEMENT MARKERS:

Pavement markers shall be placed in conformance with the provisions in Section 85, "Pavement Markers" of the Standard Specifications and these Special Provisions.

Attention is directed to "Traffic Control System For Lane Closure" of these Special Provisions regarding the use of moving lane closures during placement of pavement markers with bituminous adhesive.

The Contractor shall furnish the Engineer certificates of compliance for the pavement markers in conformance with the provisions in Section 6-1.07, "Certificates of Compliance" of the Standard Specifications.

Retroreflective pavement markers shall be marked as abrasion resistant on the body of the markers.

The contract unit prices paid per each for Pavement Marker of the types as shown on the Engineer's Estimate shall include full compensation for furnishing all labor, tools, materials, equipment, and incidentals, and for doing all the work involved as directed by the Engineer and no additional compensation will be allowed therefor.

10-1.120 DE-MOBILIZATION:

De-mobilization shall consist of the completion of all final construction and administrative work required to secure the project for termination and acceptance by the Engineer, including, but not limited to the following:

1. Satisfactory completion of Finishing Roadway in accordance with Section 22, "Finishing Roadway" of the Standard Specifications;
2. Removal of all temporary facilities, construction office, temporary utilities, plant, equipment, surplus material, construction debris and similar from project limits and adjacent property, as required and as directed by the Engineer;
3. Restoration of all temporary roads and haul routes and construction storage and office areas, etc. to original or better condition;
4. Completion of record of drawings (as-builts), to the satisfaction of the Engineer;
5. Submission of final Disadvantaged Business Enterprise report to the Engineer;
6. Submission of final certified payroll documents to the Engineer;
7. Submission of property owner releases, as required by the Engineer;
8. Completion of the requirements of permits issued by other agencies;
9. Satisfactory completion of all other contractually and legally required construction and administrative items of work.

De-Mobilization shall include the satisfactory completion of all items of work, but shall not be construed as being a separate payment for work that is paid under separate contract items. The contract item for De-Mobilization is intended for proper close-out activities.

Payment for De-Mobilization will be made on a lump sum basis in the amount of the fixed bid price after satisfactory completion of the above listed items. Payment for De-Mobilization will be included in the final pay estimate and payment. No partial payments will be made for De-Mobilization.

SECTION 10-2. (BLANK)

SECTION 10-3. SIGNALS, LIGHTING AND ELECTRICAL SYSTEMS

10-3.01 DESCRIPTION:

Traffic signals, lighting, sign illumination, ramp metering systems shall conform to the provisions in Section 86, "Signals, Lighting and Electrical Systems" of the Standard Specifications and these Special Provisions.

Traffic signal work shall be performed at the following locations:

A. Route 10 EB at Garnet Avenue (Location 1).
B. Route 10 WB at 20th Avenue (Location 2).
C. Indian Canyon Drive at Garnet Avenue (City Location 1).
D. Indian Canyon Drive at 20th Avenue (City Location 2).
E. Route 10 EB at Indian Canyon Drive (Remove Traffic Signal – Location 1).
F. Route 10 WB at Indian Canyon Drive (Remove Traffic Signal – Location 2).

Ramp Metering work shall be performed at the following locations:

A. Route 10 WB entrance ramp from SB Indian Canyon Drive (Location 1).
B. Route 10 WB loop entrance ramp from NB Indian Canyon Drive (Location 2).
C. Route 10 EB entrance ramp from WB Garnet Avenue (Location 3).
D. Route 10 EB entrance ramp from NB Indian Canyon Drive (Location 4).

10-3.02 COST BREAK-DOWN:

Cost break-downs shall conform to the provisions in Section 86-1.03, "Cost Break-Down" of the Standard Specifications and these Special Provisions.

The Engineer shall be furnished a cost break-down for each contract lump sum item of work described in this Section 10-3.

The cost break-down shall be submitted to the Engineer for approval within 15 days after the contract has been approved. The cost break-down shall be approved, in writing, by the Engineer before any partial payment for the items of electrical work will be made.

The cost breakdown shall include the following items in addition to those listed in the Standard Specifications:

A. Video Detection System (City).
B. Emergency Vehicle Detection System (City).
C. Battery Backup System.
D. Batteries.

E. Wireless cellular data communication assembly.
F. Light emitting diode signal modules each type.
G. Light emitting diode pedestrian signal modules each type.
H. Uninterruptible Power Supply System (City).

10-3.03 EQUIPMENT LIST AND DRAWINGS (City Locations Only):

The controller cabinet schematic wiring diagram and intersection sketch shall be combined into one drawing, so that, when the cabinet door is fully open, the drawing is oriented with the intersection.

A maintenance manual shall be furnished for all controller units, auxiliary equipment, and video detection system, control units, and amplifiers. The maintenance manual and operation manual may be combined into one manual. The maintenance manual or combined maintenance and operation manual shall be submitted at the time the controllers are delivered for testing or, if ordered by the Engineer, prior to purchase. The maintenance manual shall include, but need not be limited to, the following items:

A. Specifications.
B. Design characteristics.
C. General operation theory.
D. Function of all controls.
E. Trouble shooting procedure (diagnostic routine).
F. Block circuit diagram.
G. Geographical layout of components.
H. Schematic diagrams.
I. List of replaceable component parts with stock numbers.

10-3.04 MAINTAINING EXISTING AND TEMPORARY ELECTRICAL SYSTEMS:

Traffic signal system shutdowns shall be limited to periods allowed for lane closures listed or specified in "Maintaining Traffic" of these Special Provisions.

10-3.05 CAST-IN-DRILLED-HOLE CONCRETE PILE FOUNDATIONS:

GENERAL

Summary

This work includes constructing cast-in-drilled-hole concrete pile foundations for traffic signal and lighting standards.

Comply with Section 86-2.03, "Foundations" of the Standard Specifications.

MATERIALS

Concrete must contain not less than 350 kilograms of cementitious material per cubic meter.

CONSTRUCTION

For standards located in sidewalk areas, the pile foundation must be:

A. Placed to final sidewalk grade before the sidewalk is placed.
B. Square for the top 100-mm.

Use sleeve nuts on Type 1-A standards. The bottom of the base plate of Type 1-A standards must be flush with finished grade.

PAYMENT

Payment for cast-in-drilled-hole concrete pile foundations shall conform to the provisions in Section 86-8, "Payment" of the Standard Specifications.

10-3.06 STANDARDS, STEEL, PEDESTALS, AND POSTS:

Standards, steel pedestals, and posts for traffic signal and lighting standards shall conform to the provisions in Section 86-2.04, "Standards, Steel Pedestals and Posts" of the Standard Specifications, "Steel Structures" of these Special Provisions, and the following requirements.

Steel bolts not designated on the plans as high-strength (HS) or stainless steel shall be for general applications and shall conform to the requirements in ASTM Designation: A 307.

Where the plans refer to the side tenon detail at the end of the signal mast arm, the applicable tip tenon detail may be substituted.

The sign mounting hardware shall be installed at the locations shown on the plans.

Mast arm mounted street name signs shall be installed on signal mast arms at the locations shown on the plans. The Contractor-furnished hanger assembly will be similar to that shown for internally illuminated street name signs. The mounting hardware and sign shall be assembled. The assembly shall be attached to the mast arm using a 19-mm x 0.53-mm stainless steel strap in a manner similar to the strap and saddle bracket method shown on the plans. The band shall be wrapped at least twice around the mast arm, tightened, and secured with a stainless strap seal in the same manner shown for strap and saddle bracket sign mounting. Straps, seals, and saddle brackets shall be furnished by the Contractor. The sign panel shall be leveled and hardware securely tightened.

See Section 10-3.26 for City's requirement on street name sign mounting assemblies.

Handhole reinforcement rings for standards, steel pedestals, and posts shall be continuous around the handholes.

Type 1 standards shall be assembled and set with the handhole on the downstream side of the pole in relation to traffic or as shown on the plans.

All ferrous metal parts of tubular sign structures shall be galvanized and shall not be painted.

10-3.07 CONDUIT:

Conduit to be installed underground shall be Type 3 Schedule 80 unless otherwise specified. The conduit in a foundation and between a foundation and the nearest pull box shall be Type 3, Schedule 80,.

Type 2 conduit shall be used from the bridge to the first pull box.

Conduit sizes shown on the plans and specified in the Standard Specifications and these Special Provisions are referenced to metallic type conduit. When rigid non-metallic conduit is required or allowed, the nominal equivalent industry size shall be used as shown in the following table:

Size Designation for Metallic Type Conduit	Equivalent Size for Rigid Non-metallic Conduit
21-mm	20-mm
27-mm	25-mm
41-mm	40-mm
53-mm	50-mm
63-mm	65-mm
78-mm	75-mm
103-mm	100-mm

When a standard coupling cannot be used for joining Type 1 conduit, a UL listed threaded union coupling conforming to the provisions in Section 86-2.05C, "Installation" of the Standard Specifications, shall be used.

After conductors have been installed, the ends of conduits terminating in pull boxes, service equipment enclosures, and controller cabinets shall be sealed with an approved type of sealing compound.

10-3.08 PULL BOXES (City Locations Only):

Grout shall not be placed in the bottom of pull boxes.

10-3.09 CONDUCTORS AND WIRING:

Splices shall be insulated by "Method B".

Signal Interconnect Cable (SIC) shall be the 6-pair type.

10-3.10 BONDING AND GROUNDING:

Bonding and grounding shall conform to the provisions in Section 86-2.10, "Bonding and Grounding" of the Standard Specifications and these Special Provisions.

Bonding jumpers in standards with handholes and traffic pull box lid covers shall be attached by a UL listed lug using 4.5-mm diameter or larger brass or bronze bolts and shall run to the conduit or bonding wire in the adjacent pull box. The grounding jumper shall be visible after the standard has been installed and the mortar pad and cap have been placed on the foundation.

Standards without handholes shall have bonding accomplished by jumpers attached to UL listed ground clamps on each anchor bolt.

For slip base standards bonding shall be accomplished by jumpers attached to UL listed ground clamps on each anchor bolt, or a UL listed lug attached to the bottom slip base plate with a 4.5-mm diameter or larger brass or bronze bolt.

Equipment bonding and grounding conductors are required in all conduits, except when the conduits contain only fiber optic cable. A No. 8 minimum, bare copper wire shall run continuously in circuits. The bonding wire size shall be increased to match the circuit breaker size in conformance with the Code, or shall be as shown on the plans. Conduits to be installed for future conductors, may omit the copper wire.

Bonding of metallic conduits in metal pull boxes shall be by means of bonding bushings and bonding jumpers connected to the bonding wire running in the conduit system.

10-3.11 SERVICE:

Continuous welding of exterior seams in service equipment enclosures is not required.

Circuit breakers shall be the plug in type. All circuit breakers shall be mounted vertically with the up position of the handle being the "ON" position.

Each service shall be provided with up to 2 main circuit breakers which shall disconnect ungrounded service entrance conductors. Where the "Main" circuit breaker consists of 2 circuit breakers as shown on the plans or required in these Special Provisions, each of the circuit breakers shall have a minimum interrupting capacity of 10,000 A, rms.

SERVICE (City Locations):

The electrical service cabinet shall be a Tesco Class 26-000 or equal. Continuous welding of exterior seams in service equipment enclosures is not required.

The type III-AF service equipment enclosure as shown on the Plans shall be powder coated flat black on the interior and gloss white on the exterior.

All overlapping exterior seams and doors shall meet the requirements for Type 3R enclosures specified in the NEMA Enclosure Standards.

Service wiring shall be as indicated on the detail sheet service wiring diagram.

Contractor shall verify the service location prior to trenching for electrical service conduit.

Contractor shall coordinate with SCE for electrical service turn on.

10-3.12 NUMBERING ELECTRICAL EQUIPMENT:

The placement of numbers on electrical equipment will be done by others.

10-3.13 STATE-FURNISHED CONTROLLER ASSEMBLIES:

The Model 170 and 2070 controller assemblies, excluding anchor bolts, will be State-furnished as provided under "Materials" of these Special Provisions.

The Contractor shall construct each controller cabinet foundation as shown on the plans for Model 332A and 334 cabinets (including furnishing and installing anchor bolts), shall install the controller cabinet on the foundation, and shall make field wiring connections to the terminal blocks in the controller cabinet.

A listing of field conductor terminations, in each State-furnished controller cabinet, will be furnished free of charge to the Contractor at the site of the work.

State forces will maintain controller assemblies. The Contractor's responsibility for controller assemblies shall be limited to conforming to the provisions in Section 6-1.02, "State-Furnished Materials" of the Standard Specifications.

10-3.14 MODEL 170E CONTROLLER ASSEMBLY (City Locations):

Model 170E controller assemblies, including controller unit, fan, light, test switches, emergency vehicle pre-emption equipment, video detection system, uninterrupted power supply system, completely wired controller cabinet, and auxiliary equipment shall be furnished and installed by the Contractor in accordance with the Section 86 of the Caltrans Standard Specifications, and these Special Provisions.

The Contractor shall construct controller cabinet foundation as shown on Standard Plan RSP ES-3C for Model 332 cabinets to be installed (including furnishing and installing anchor bolts), and shall install the controller cabinet on said foundations, and shall make all field wiring connections to the terminal blocks in the controller cabinet.

The Contractor shall furnish and install the controller assembly. The controller assembly shall be a Type 170E Quad with a time base coordination module to provide 8-phase operation and shall be capable of accepting uploading and downloading.

The controller unit shall be furnished complete with a Model 400 modem, quad ACIA ports, a Model 412C program module, and a BI Tran Systems 200 SA local controller software program. The program module shall be configured utilizing Method 2 Memory Select 4 and shall be furnished with one each of 27256 EPROM, D1225 Zero Power RAM, and 6264 RAM.

The Contractor shall arrange to have a qualified signal technician present at the time the equipment is turned on. Said signal technician shall be qualified to work on the controller unit and shall be an employee of the controller unit manufacturer and BI Tran System or their representative.

The controller assembly shall be furnished with a shelf and drawer to facilitate the use of a keyboard and mouse as required by the computer unit and video monitor used in the video detection system.

All controls and displays of the controller assembly shall face the front of the cabinet. The controller, battery back-up system, and detector racks shall all face in the same direction toward the front of the cabinet allowing a system operator to view their operation simultaneously. The Contractor shall coordinate installation of all controller assembly equipment within the controller cabinet with the Engineer prior to installation. The Engineer shall approve the configuration of controller assembly components prior to their installation.

Testing

Functional testing shall not begin, nor signal energizing occur, on a Friday or on the day preceding a legal holiday, and as specified in Section 86-1.07 of the Standard Specifications.

Functional testing

Functional testing shall conform to the provisions in Section 86- 2.14C, "Functional Testing" of the Standard Specifications and these Special Provisions.

The fourth paragraph of Section B6-2.14C, "Functional Testing" of the Standard Specifications is amended to read:

> The functional test for a new traffic signal system shall consist of not less than 14 days of continuous, satisfactory operation. If unsatisfactory performance of the

system develops, the condition shall be corrected and the test shall be repeated until the 14 days of continuous, satisfactory operation is obtained.

Inspection of Work and Testing Laboratory

The Engineer may be represented on the work site by inspectors and other duly authorized representatives.

All submittals and correspondence between the City and the Contractor, related to inspection of the work on this contract, shall be directed to the Engineer.
The Contractor shall be responsible for providing a certified laboratory for the testing of all materials and work on the traffic signal, lighting and electrical system, as required by the Engineer.

The Contractor shall be responsible for designating a laboratory or manufacturer for testing of new traffic signal controllers, and the Contractor shall provide all new controllers to that laboratory or manufacturer for testing at least 3 weeks prior to their installation. The Contractor shall provide advance notice to the Engineer of the selected laboratory or manufacturer to perform the required environmental and functional testing of the new traffic signal controllers, for review and approval by the Engineer.

Note: Complete environmental and functional testing of the traffic signal controller is required to be coordinated by the Contractor.

The City has identified two sources available to provide new controller testing. The following sources are non-exclusive, and the Engineer will accept other sources selected by the Contractor to provide the new traffic signal controller testing. The Contractor assumes all liability for selecting its laboratory or manufacturer for new traffic signal controller testing, including the two sources listed below:

Computer Service Company
210 N. Delilah Street
Corona, CA92879
(e51) 738-1444

Republic ITS
1266 N. La Loma Circle
Anaheim, CA 92806
(714) 630-2100

The Contractor shall be responsible for all costs associated with the environmental and functional testing of the new traffic signal controllers, to be tested at the Contractor's selected testing laboratory or manufacturer. Payment for functional testing of new traffic signal controllers and associated services shall be considered as included in the lump sum bid item price for Signal and Lighting (City Locations 1 and 2) and no additional compensation will be allowed therefor.

10-3.15 VEHICLE SIGNAL FACES AND SIGNAL HEADS:

Type SV-1-T mountings with 5 sections and SV-2-TD mountings shall be bolted to the standard through the upper pipe fitting in the same manner shown for bolting the terminal compartment.

10-3.16 LIGHT EMITTING DIODE SIGNAL MODULE:

GENERAL

Summary

This work includes installing LED signal module. Comply with Section 86, "Signals, Lighting and Electrical Systems" of the Standard Specifications.

Location of LED signal module is shown on the plans. The Engineer will approve exact location.

Use LED signal module as the light source for the following traffic signal faces:

A. 300-mm section.
B. 300-mm arrow section.

Submittals

Before shipping LED signal modules to job site, submit the following to the Transportation Laboratory:

A. Delivery form including district number, EA, and contact information.
B. List containing all LED signal module serial numbers anticipated for use.
C. LED signal modules.

Quality Control and Assurance

Module must be one listed on the Pre-Qualified Products List for LED traffic signals at:

http://www.dot.ca.gov/hq/esc/approved_products_list

The State will test LED signal module shipments as specified in ANSI/ASQ Z1.4.. Testing will be completed within 30 days of delivery to the Transportation Laboratory. LED signal modules tested or submitted for testing must be representative of typical production units. LED and circular LED signal modules will be tested as specified in California Test 604. Arrow, U-turn, and bicycle LED signal modules will be tested as specified in California Test 3001. All parameters of the specification may be tested on the modules. LEDs must be spread evenly across the module. LED arrow indication must provide the minimum initial luminous intensity listed. Measurements will be performed at the rated operating voltage of 120 V(ac).

Delays resulting from submittal of non-compliant materials do not relieve the Contractor from executing the contract within the allotted time. Non-compliant materials will be rejected. The Contractor must resubmit new LED for retesting and pick up the failed units within 7 days of notification. The Contractor must provide new LED signal modules and allow a minimum of 30 days for the retest. The Contractor must pay for all shipping and handling costs related to testing and retesting. Delays resulting from resubmittal and retesting are the Contractor's responsibility and no extra time will be allowed.

After testing, the Contractor must pick up the tested LED signal modules from the Transportation Laboratory and deliver to the job site.

Warranty

The manufacturer must provide a written warranty against defects in materials and workmanship for LED signal modules for a minimum period of 60 months after installation of LED signal modules. Replacement LED signal modules must be provided within 15 days after receipt of failed LED modules at the Contractor's expense. The County pays for shipping the failed modules to the Contractor. All warranty documentation must be submitted to the Engineer before installation. Replacement LED signal modules must be delivered to State Maintenance Electrical Shop at 175 Cluster Street, San Bernardino, CA 92408.

MATERIALS

Minimum power consumption for LED signal module must be 5 W.

LED signal module must have an operational lifecycle rating of 60 months. During the operational lifecycle, LED signal module must meet all parameters of this specification.

LED signal module must be designed for installation in the door frame of standard traffic signal housing.

LED signal module must:

A. Be 1.8 kg maximum mass.
B. Be manufactured for 300-mm circular, arrow section.
C. Be from the same manufacturer.
D. Be the same model for each size.
E. Be sealed units with:

    1. 2 color-coded conductors for power connection, except for lane control LED signal modules use 3 color-coded conductors.
    2. Printed circuit board and power supply contained inside and complying with Chapter 1, Section 6 of TEES published by the Department.
    3. Lens that is:

        3.1. Integral to the units.
        3.2. Convex or flat with a smooth outer surface.

3.3. Made of UV stabilized plastic or glass, and withstands UV exposure from direct sunlight for 60 months without exhibiting evidence of deterioration.

4. 1-piece EPDM gasket.

F. Include 1-meter long conductors with quick disconnect terminals attached as specified in Section 86-4.01C, "Electrical Components," of the Standard Specifications.
G. Be sealed in door frames.
H. Fit into existing traffic signal section housing and comply with ITE publication, Equipment and Material Standards, Chapter 2, "Vehicle Traffic Control Signal Heads".

Individual LEDs must be wired so catastrophic loss or failure of 1 LED will not result in loss of more than 5 percent of the signal module light output. Failure of an individual LED in a string must not result in loss of entire string or other indication.

No special tools for installation are allowed.

300-mm Arrow

Comply with Section 9.01 of ITE publication, Equipment and Material Standards, Chapter 2, "Vehicle Traffic Control Signal Heads" for arrow indications.

LED signal module must:

A. Be weather tight and connect directly to electrical wiring.
B. Be capable of optical unit replacement.
C. Be a single, self-contained device, ready for installation into traffic signal housing.
D. Have manufacturer's name, trademark, model number, serial number, lot number, month and year of manufacture, and required operating characteristics, including rated voltage, power consumption, and volt-ampere, permanently marked on the back of the module.
E. Have a symbol of module type and color. Symbol must be 25 mm in diameter. Color must be written out in 13 mm high letters next to the symbol.
F. Be AlInGaP technology for red and yellow indications and gallium nitride technology for green indications.
G. Be ultra bright type rated for 100,000 hours of continuous operation from -40 °C to +74 °C.

H. Have a maximum power consumption as follows:

Power Consumption Requirements

LED Signal Module Type	Power Consumption (Watts)					
	Red		Yellow		Green	
	25 °C	74 °C	25 °C	74 °C	25 °C	74 °C
300-mm circular	11	17	22	25	15	15
300-mm arrow	9	12	10	12	11	11

Lens may be tinted, or may use transparent film or materials with similar characteristics to enhance "ON/OFF" contrasts. Tinting or other materials to enhance "ON/OFF" contrast must not affect chromaticity and must be uniform across the face of the lens.

If polymeric lens is used, surface coating or chemical surface treatment must be applied for front surface abrasion resistance.

Power supply must be integral to the module.

Internal components must be adequately supported to withstand mechanical shock and vibration from high winds and other sources.

Lens and LED signal module material must comply with the ASTM specifications for that material.

Enclosures containing either the power supply or electronic components of LED signal module, except lenses, must be made of UL94VO flame-retardant material.

If a specific mounting orientation is required, the LED signal module must have prominent and permanent vertical markings for accurate indexing and orientation within the signal housing. Markings must include an up arrow, or the word "UP" or "TOP".

LED signal module must meet or exceed the following values when operating at 25 °C:

Minimum Initial Intensities for Circular Indications (cd)

Angle (v,h)	300-mm		
	Red	Yellow	Green
2.5, ±2.5	399	798	798
2.5, ±7.5	295	589	589
2.5, ±12.5	166	333	333
2.5, ±17.5	90	181	181
7.5, ±2.5	266	532	532
7.5, ±7.5	238	475	475
7.5, ±12.5	171	342	342
7.5, ±17.5	105	209	209
7.5, ±22.5	45	90	90
7.5, ±27.5	19	38	38
12.5, ±2.5	59	119	119
12.5, ±7.5	57	114	114
12.5, ±12.5	52	105	105
12.5, ±17.5	40	81	81
12.5, ±22.5	26	52	52
12.5, ±27.5	19	38	38
17.5, ±2.5	26	52	52
17.5, ±7.5	26	52	52
17.5, ±12.5	26	52	52
17.5, ±17.5	26	52	52
17.5, ±22.5	24	48	48
17.5, ±27.5	19	38	38

Minimum Luminance for Arrows, U-turn, Bicycle, Lane Control, and PV Indications (cd/m2)

	Red	Yellow	Green
Arrow Indication	5,500	11,000	11,000

LED signal module must meet or exceed the following illumination values for 48 months when operating over a temperature range of -40 °C to + 74 °C. Yellow LED signal module must meet or exceed the following illumination values for 48 months, when operating at 25 °C:

Minimum Maintained Intensities for Circular Indications (cd)

	300-mm		
Angle (v,h)	Red	Yellow	Green
2.5, ±2.5	339	678	678
2.5, ±7.5	251	501	501
2.5, ±12.5	141	283	283
2.5, ±17.5	77	154	154
7.5, ±2.5	226	452	452
7.5, ±7.5	202	404	404
7.5, ±12.5	145	291	291
7.5, ±17.5	89	178	178
7.5, ±22.5	38	77	77
7.5, ±27.5	16	32	32
12.5, ±2.5	50	101	101
12.5, ±7.5	48	97	97
12.5, ±12.5	44	89	89
12.5, ±17.5	34	69	69
12.5, ±22.5	22	44	44
12.5, ±27.5	16	32	32
17.5, ±2.5	22	44	44
17.5, ±7.5	22	44	44
17.5, ±12.5	22	44	44
17.5, ±17.5	22	44	44
17.5, ±22.5	20	41	41
17.5, ±27.5	16	32	32

Minimum Maintained Luminance for Arrow, U-turn, Bicycle, Lane Control, and PV Indications (cd/m2)

	Red	Yellow	Green
Arrow Indication	5,500	11,000	11,000

LED signal module must comply with the following chromaticity requirements for 48 months when operating over a temperature range of -40 °C to +74 °C.

Chromaticity Standards (CIE Chart)

Red	Y: not greater than 0.308, or less than 0.998 -x
Yellow	Y: not less than 0.411, nor less than 0.995 - x, nor greater than 0.452
Green	Y: not less than 0.506 - 0.519x, nor less than 0.150 + 1.068x, nor more than 0.730 - x

LED signal module must operate:

A. At a frequency of 60 Hz ± 3 Hz, over a voltage range from 95 V(ac) to 135 V(ac), without perceptible flicker to the unaided eye. Fluctuations of line voltage must have no visible effect on luminous intensity of the indications. Rated voltage for measurements must be 120 V(ac).

B. Compatible with currently used controller assemblies, including solid state load switches, flashers, and conflict monitors. Comply with TEES Chapters 3 and 6. If a 20 mA alternating current or less is applied to the unit, the voltage read across the 2 leads must be 15 V(ac) or less.

Wiring and terminal block must comply with Section 13.02 of ITE publication, Equipment and Material Standards, Chapter 2, "Vehicle Traffic Control Signal Heads." Electrical connection for each Type 1 LED signal module must be 2 secured, color-coded, 1-meter long, 600 V(ac), 20 AWG minimum stranded jacketed copper wires. Wires must comply with NEC, rated for service at +105 °C.

LED signal module on-board circuitry must:

A. Include voltage surge protection to withstand high-repetition noise transients. The voltage surge protection must comply with NEMA Standard TS2, Section 2.1.6.

B. Comply with FCC, Title 47, SubPart B, Section 15 regulations for Class A emission limits for electronic noise.

LED signal module must provide a power factor of 0.90 or greater.

Total harmonic distortion from current and voltage induced into an alternating current power line by LED signal module must not exceed 20 percent at an operating temperature of 25 °C.

When power is applied to LED signal module, light emission must occur within 90 ms.

10-3.17 BATTERY BACKUP SYSTEM (State Locations Only):

GENERAL

Summary

This work includes installing battery backup system (BBS). Comply with Section 86, "Signals, Lighting and Electrical Systems" of the Standard Specifications and TEES.

The State will furnish BBS components as listed in "Materials" of these Special Provisions.

The Contractor must furnish the external cabinet and batteries.

Submittals

Before shipping external cabinets to the jobsite, submit material list including contract number, cabinet serial numbers, and contact information to the Transportation Laboratory.

Submit a Certificate of Compliance for each external cabinet and batteries to the Engineer under Section 6-1.07, "Certificates of Compliance" of the Standard Specifications.

Quality Control and Assurance

The State may test the cabinets.

Functional Testing

After complete installation, BBS functional test must be performed. Test for 30 minutes of continuous, satisfactory operation with utility power turned off. Perform test in the presence of the Engineer.

Warranty

Batteries must be warranted by the manufacturer to operate within a temperature range of -25 °C to +74 °C for 2 years.

Batteries must have a written warranty against defects in materials and workmanship from the manufacturer prorated for a period of 60 months after installation. The Contractor must provide the Engineer with all warranty documentation before installation. Replacement batteries must be available within 5 business days after receipt of failed batteries at no cost to the State except the cost of shipping the failed batteries. Replacement batteries must be delivered to Caltrans Maintenance Electrical Shop at 174 Cluster Street, San Bernardino, CA 92408, telephone (909) 383-7094.

MATERIALS

Batteries must:

A. Be deep cycle, sealed prismatic, lead-calcium-based, absorbed-glass mat and valve-regulated lead acid (AGM/VRLA) type.
B. Have voltage rating of 12 V.
C. Be group size 24.
D. Be commercially available and stocked locally.
E. Have a carrying handle.
F. Be marked with date code, maximum recharge data, and recharge cycles.
G. Have 2 top-mounted, threaded, stud posts that include all washers and nuts required for attaching 9.5-mm ring lugs of a State-furnished BBS battery harness.
H. Include rubber insulating protective covers for protecting the lugs, posts, and wiring - red for positive terminal and black for negative terminal.
I. Be new and fully-charged when furnished.
J. Be free from damage or deformities.

External cabinet must be one listed on the Pre-Qualified Products List at:

http://www.dot.ca.gov/hq/esc/approved_products_list/

External cabinet must be capable of housing:

A. 8 batteries.
B. Inverter/charger unit.
C. Power transfer relay.
D. Manually-operated bypass switch.
E. Required control panels.
F. Wiring and harnesses.

Dimensions and details for the external cabinet, for attaching the external cabinet to the Model 332A cabinet, and for wiring the State-furnished equipment will be available in an information handout as described in "Project Information" of these Special Provisions.

The following details must comply with Section 86-3.04, "Controller Cabinets" of the Standard Specifications and TEES:

A. Door construction, including material, thickness, coating, and welds.
B. Frame.
C. Door seals.
D. Continuous stainless steel piano hinge or 4 leaves with 2 bolts on each side of each leaf, used to connect the door to external cabinet.
E. Padlock clasp or latch and lock mechanism.

The external cabinet must be ventilated by using louvered vents, filter, and a thermostatically controlled fan. Fan must be AC-operated from the same line output as the Model 332A cabinet. A 2-position terminal block must be provided on the fan panel, along with 3 meters of connected hookup wire.

The external cabinet surface must be anodized aluminum. Anti-graffiti paint must not be used.

The external cabinet must include all bolts, washers, nuts, and cabinet-to-cabinet coupler fittings necessary for mounting it to the Model 332A cabinet.

Fasteners for the external cabinet must include:

A. 8 cabinet mounting bolts that are 18-8 stainless steel hex head, fully-threaded, and 9.5 mm – 16 x 25.4 mm.
B. 2 washers per bolt designed for 9.5-mm bolt and are 18-8 stainless steel 25.4-mm OD round flat type.
C. K-lock nut per bolt: K-lock washer that is 18-8 stainless steel and hex-nut.

External cabinet to Model 332A cabinet couplings must include a conduit for power connections between the 2 cabinets. Couplings must include:

A. 51-mm nylon-insulated steel chase nipple, T & B 1947 or equivalent.
B. 51-mm sealing, steel locknut, T & B 146SL or equivalent.
C. 51-mm nylon-insulated steel bushing, T & B 1227 or equivalent.

CONSTRUCTION

Mount external cabinet to either the left or right side of Model 332A cabinet. The typical side-mounting location of external cabinet is flush with the bottom of the Model 332A cabinet and approximately equidistant from the front and rear door edges.

MEASUREMENT AND PAYMENT

Full compensation for assembling and installing battery backup system is included in the contract lump sum price paid for Signal And Lighting (State Location 1 and 2), and no separate payment will be made therefor.

10-3.18 UNINTERRUPTIBLE POWER SUPPLY SYSTEM (City Locations):

Contractor will furnish and install Clary SP 100SR/SN Universal Systems for LED signal applications, complete with UPS Power Module and Power Interface Module, and associated equipment (or approved equal). The UPS battery system shall be located outside of the traffic signal controller cabinet in a No. 6(E) pull box, as shown on the plans.

Full compensation, except as otherwise provided herein, for conforming to the requirements of this article shall be included in the contract lump sum price paid for Signal And Lighting (State Location 1 and 2), and no separate payment will be made therefor.

10-3.19 LIGHT EMITTING DIODE PEDESTRIAN SIGNAL FACE MODULES:

GENERAL

Summary

This work includes installing LED pedestrian signal face (PSF) module into standard Type A pedestrian signal housing. Comply with Section 86, "Signals, Lighting and Electrical Systems" of the Standard Specifications.

Submittals

Before shipping LED PSF modules to job site, submit the following to the Transportation Laboratory:

A. Delivery form including district number, EA, and contact information.
B. List containing all LED PSF module serial numbers anticipated for use.
C. LED PSF modules.

Quality Control and Assurance

Module must be one listed on the Pre-Qualified Products List for LED traffic signals at:

http://www.dot.ca.gov/hq/esc/approved_products_list

The State will test LED PSF module shipments as specified in ANSI/ASQ Z1.4.. Testing will be completed within 30 days of delivery to the Transportation Laboratory. LED PSF modules tested or submitted for testing must be representative of typical production units. LED PSF modules will be tested as specified in California Test 606 All parameters of the specification may be tested on the modules.

Delays resulting from submittal of non-compliant materials do not relieve the Contractor from executing the contract within the allotted time. Non-compliant materials will be rejected. The Contractor must resubmit new LED for retesting and pick up the failed units within 7 days of notification. The Contractor must provide new LED PSF modules and allow a minimum of 30 days for the retest. The Contractor must pay for all shipping and handling costs related to testing and retesting. Delays resulting from resubmittal and retesting are the Contractor's responsibility and no extra time will be allowed.

After successful testing, the Contractor must pick up the tested LED PSF modules from the Transportation Laboratory and deliver to the job site.

Warranty

The manufacturer must provide a written warranty against defects in materials and workmanship for LED PSF modules for a minimum period of 60 months after installation of LED PSF modules. Replacement LED PSF modules must be provided within 15 days after receipt of failed LED PSF modules at the Contractor's expense. The County pays for shipping the failed modules to the Contractor. All warranty documentation must be submitted to the Engineer before installation. Replacement LED PSF modules must be delivered to State Maintenance Electrical Shop at 175 Cluster Street, San Bernardino, CA 92408.

MATERIALS

LED PSF module must:

A. Be from the same manufacturer.
B. Be installed in standard Type A pedestrian signal housing, "UPRAISED HAND" and "WALKING PERSON." Do not include reflectors.
C. Use LED as the light source.
D. Be designed to mount behind or replace face plates of standard Type A housing as specified in ITE publication, Equipment and Material Standards, Chapter 3, "Pedestrian Traffic Control Signal Indications" and the "California MUTCD".

E. Have a minimum power consumption of 10 W.
F. Use required color and be ultra bright type rated for 100,000 hours of continuous operation from -40 °C to +74 °C.
G. Be able to replace signal lamp optical units and pedestrian signal faces with both LED and incandescent light sources.
H. Fit into pedestrian signal section housings without modifications to the housing. The housing must comply with ITE publication, Equipment and Materials Standards, Chapter 3, "Pedestrian Traffic Control Signal Heads".
I. Be a single, self-contained device, not requiring on-site assembly for installation into standard Type A housing.
J. Have the following information permanently marked on the back of module:

1. Manufacturer's name.
2. Trademark.
3. Model number.
4. Serial number.
5. Lot number.
6. Month and year of manufacture.
7. Required operating characteristics, as follows:

7.1. Rated voltage.
7.2. Power consumption.
7.3. Volt-ampere (VA).
7.4. Power factor.

K. Have prominent and permanent vertical markings for accurate indexing and orientation within the signal housing if a specific mounting orientation is required. Markings must include an up arrow, or the word "UP" or "TOP." Marking must be a minimum of 25-mm diameter.

Circuit board and power supply must be contained inside the LED PSF modules. Circuit board must comply with Chapter 1, Section 6 of TEES published by the Department.

Individual LEDs must be wired so catastrophic loss or failure of 1 LED will not result in loss of more than 5 percent of the PSF module light output. Failure of an individual LED in a string must not result in the loss of entire string or other indication.

LEDs must be evenly distributed in each indication. Do not use outline forms.
No special tools for installation are allowed.

Installation of the LED PSF module into pedestrian signal face must require only removal of lenses, reflectors, lamps, and existing LED modules.

Power supply for LED PSF module must be integral to the module. Power supply for each symbol must be isolated to avoid turn-on conflict.

Assembly and manufacturing processes for LED PSF module must assure that all internal components are adequately supported to withstand mechanical shock and vibration from high winds and other sources.

Material used for LED PSF module must comply with ASTM D 3935.

Enclosures containing either the power supply or electronic components of LED PSF module, except lenses, must be made of UL94VO flame-retardant material.

Color of "UPRAISED HAND" symbol must be portland orange.

Color of "WALKING PERSON" symbol must be lunar white.

Each symbol must not be less than 250-mm high and 165 mm wide. Uniformity ratio of illuminated symbols must not exceed 4 to 1 between highest and lowest luminance areas. Symbols must comply with ITE publication, Equipment and Material Standards, Chapter 3, "Pedestrian Traffic Control Signal Indications" and the "California MUTCD".

LED PSF module must maintain an average luminance value over 48 months of continuous use in signal operation for a temperature range of -40 °C to +74 °C. In addition, LED PSF modules must meet or exceed the following luminance values upon initial testing at 25 °C.

Luminance Values

PSF module	Luminance
UPRAISED HAND	3,750 cd/m2
WALKING PERSON	5,300 cd/m2

Color output of LED PSF module must comply with chromaticity requirements in Section 5.3 of ITE publication, Equipment and Material Standards, Chapter 3, "Pedestrian Traffic Control Signal Indications".

Measured chromaticity coordinates of LED PSF module must comply with the following chromaticity requirements for 48 months when operating over a temperature range of -40 °C to +74 °C.

Chromaticity Standards (CIE Chart)

UPRAISED HAND (portland orange)	Not greater then 0.390, nor less than 0.331, nor less than 0.997-X
WALKING PERSON (lunar white)	X: not less than 0.280, nor greater than 0.320 Y: not less than 1.055*X - 0.0128, nor greater than 1.055*X + 0.0072

LED PSF module maximum power consumption must not exceed the following values:

Power Consumption Requirements

PSF module	Power Consumption @ 24°C	Power Consumption @ 74°C
UPRAISED HAND	10.0 W	12.0 W
WALKING PERSON	9.0 W	12.0 W

Wiring and terminal block must comply with Section 13.02 of ITE publication, Equipment and Material Standards, Chapter 2, "Vehicle Traffic Control Signal Heads". The LED PSF module must be supplied with spade lugs and 3 secured, color-coded, 1

meter long, 600 V(ac), 20 AWG minimum stranded jacketed copper wires. Wires must comply with NEC, rated for service at +105 °C.

LED PSF module must operate:

A. At a frequency of 60 Hz ± 3 Hz over a voltage range from 95 V(ac) to 135 V(ac) without perceptible flicker to the unaided eye. Fluctuations of line voltage must have no visible effect on luminous intensity of the indications. Rated voltage for measurements must be 120 V(ac).

B. Compatible with currently used State controller assemblies including solid state load switches, flashers, and conflict monitors. Comply with TEES Chapters 3 and 6. If a 20 ma alternating current or less is applied to the unit, the voltage read across the 2 leads must be 15 V(ac) or less.

LED PSF module on-board circuitry must:

A. Include voltage surge protection to withstand high-repetition noise transients. The voltage surge protection must comply with NEMA Standard TS2, Section 2.1.6.

B. Comply with FCC, Title 47, Sub-Part B, Section 15 regulations for Class A emission limits for electronic noise.

LED PSF module must provide a power factor of 0.90 or greater.

Total harmonic distortion from current and voltage induced into an alternating current power line by LED PSF module must not exceed 20 percent at an operating temperature of 25 °C.

The LED PSF module circuitry must prevent perceptible light emission to the unaided eye when a voltage, 50 V(ac) or less is applied to the unit.

When power is applied to LED PSF module, light emission must occur within 90 ms.

The "UPRAISED HAND" and "WALKING PERSON" symbol indications must be electrically isolated from each other. Sharing a power supply or interconnect circuitry between the 2 indications is not allowed.

10-3.20 DETECTORS:

Loop detector sensor units will be State-furnished in conformance with the provisions in "Materials" of these Special Provisions.

Loop detector lead-in cable shall be Type B.

For Type E detector loops, sides of the slot shall be vertical and the minimum radius of the slot entering and leaving the circular part of the loop shall be 40-mm. Slot width shall be a maximum of 16-mm. Loop wire for circular loops shall be Type 2. Slots of circular loops shall be filled with hot melt rubberized asphalt sealant.

10-3.21 VIDEO DETECTION SYSTEM (City Locations):

The Contractor will furnish, install and test the video detection system as specified in these Special Provisions. The video detection system shall be Iteris Vantage Plus (multi-camera) system, to match the equipment currently in use by the City elsewhere.

Installation

The supplier of the video detection system shall furnish complete documentation describing installation requirements within 10 days of placement of order. Such documentation shall include description of all required cabling, mounting, cameras, cabinet space, and power.

Suitable video cabling and connections shall be installed to ensure the video signal losses between each camera and the ACU do not exceed 3dB. All power cabling shall be installed to comply with the National Electrical Code, as well as local electrical codes.

The manufacturer of the system or its officially certified representative shall supervise the installation and testing of the system.

Warranty, Maintenance and Support

The system shall be warranted by the manufacturers for a minimum period of three (3) years from the date of installation or two and one half (2%) years from date of shipment, whichever occurs first.

During the warranty period, technical support by telephone shall be provided the supplier 24 hours per day, reasonable exceptions being national holidays, and requests for support by telephone shall be answered by factory certified personnel within one (l) hour.
During the warranty period, certified personnel from supplier shall be on site within forty-eight (48) hours, if required, reasonable exceptions being national holidays.

The supplier shall maintain a program for technical support and software updates following expiration of the warranty period. This program shall be made available to the contracting agency in the form of a separate agreement for the continuing support.

The power supply for the video monitor in the cabinet shall be a GFI protected receptacle. The power to said receptacle shall be controlled by the door switch that the monitor faces.

Full compensation, except as otherwise provided herein, for conforming to the requirements of this article shall be included in the contract lump sum price paid for Signal And Lighting (State Location 1 and 2), and no separate payment will be made therefor.

10-3.22 EMERGENCY VEHICLE DETECTION SYSTEM (City Locations):

GENERAL

A complete, functioning, Tomar "Strobecom II" Optical Preemption and Priority Control System, complete with four (4) Tomar Model 2091-ST optical detectors, Tomar Model 2140 optical signal processor (OSP), M913 detector cable, and associated equipment (or approved equal) shall be furnished and installed by the Contractor at each location. Emergency vehicle detection equipment shall be furnished and installed and shall include:

A. Tomar Model 2091-ST optical detectors, or equal, for each approach as shown on Plans.
B. Tomar Model 2140 optical signal processor (OSP), sufficient for 8-phase operation.
C. Tomar M913 detector cable.
D. Tomar Model 1850B emitter.

The system shall be designed to prevent simultaneous preemption by two or more emergency vehicles on separate approaches to the intersection.

Optical Detector

The optical detector shall be mounted on the indicated signal mast arm by an approved mast arm clamp. The detector shall not be mounted on the signal head.

Emergency vehicle preemption sequence of operation shall be subject to the approval of the Engineer prior to timing and turn-on of signals.

It shall be the responsibility of the Contractor to provide the services of a knowledgeable representative of the manufacturer of the emergency vehicle preemption equipment to be present for not less than the first day of the traffic signal lighting function test to ensure proper installation and functioning of the equipment. The optical detector shall be a light-weight, weatherproof, adjustable, bi-directional optical detector assembly. Internal circuitry shall transform optical energy from the optical emitter assembly into electrical signals for delivery via optical detector cable to the phase selection equipment.

The optical detector cable shall be a durable, shielded, 3-conductor cable with a drain wire and the necessary electrical characteristics to carry power to the optical detector from the phase selector and to carry the optical detector signal to the phase selector. It shall conform to the written requirements of the manufacturer of the phase selector and optical detector.

Phase Selector

This equipment shall interface between the optical detector and the controller cabinet. It shall interface with the signal controller and provide the following functions while not compromising the control equipment fail-safe provisions:

A. Sufficient power to all optical detectors required for the intersection.
B. Sensitivity to the optical detector signal via adjustable range potentiometers.

C. Differentiation of signals by optical detectors from one or more emitters on a first-come, first-served basis.
D. Outputs to signal the controller to cause selection of the desired phase green display for the approaching vehicle.
E. Smooth transition to non-priority operation upon passage of the vehicle through the intersection.

Other

The Contractor shall provide a vehicle equipped with an emitter to test and verify satisfactory operation of the equipment.

MEASUREMENT AND PAYMENT

Payment for emergency vehicle detection equipment shall be considered as included in the contract lump sum price paid for Signal and Lighting (City Location 1 and 2) and no additional compensation will be made therefor.

10-3.23 LUMINAIRES:

Ballasts shall be the lag regulator type.

10-3.24 SIGN LIGHTING FIXTURES-INDUCTION:

Induction sign lighting fixtures shall conform to the provisions for mercury sign lighting fixtures in Section 86-6.05, "Sign Lighting Fixtures-Mercury" of the Standard Specifications and these Special Provisions.

Fixtures shall have a minimum average rating of 60 000 hours. Fixtures shall be for a wattage of 87 W, 120/240 V(ac). The power factor of the fixtures shall be greater than 90 percent and the total harmonic distortion shall be less than 10 percent. Fixtures shall be Underwriter's Laboratories (UL) approved for wet locations and be Federal Communications Commission (FCC) Class A listed.

The mass of the fixture shall not exceed 20 kg. The manufacturer's brand name, trademark, model number, serial number and date of manufacture shall be located on the packaged assembly and permanently marked on the outside and inside of the housing.

MATERIALS

Mounting Assembly

The mounting assembly may be either cast aluminum, hot-dip galvanized steel plate or steel plate that has been galvanized and finished with a polymeric coating system or the same finish that is used for the housing.

Housing

Housings shall have a door designed to hold a refractor or lens. Housing doors shall be designed to be opened without the use of tools. Housings and doors shall have a powder coat or polyester paint finish of a gray color resembling unfinished fabricated aluminum.

Reflector

Reflectors shall be designed to be removed as a unit that includes the lamp and power coupler.

Refractor

Refractors or lenses shall have smooth exteriors. Lenses shall be flat or convex. Convex lenses shall be made from heat resistant, high-impact resistant, tempered glass.

Convex lenses shall be designed or shielded so that no fixture luminance is visible when the fixture is approached directly from the rear and the viewing level is the bottom of the fixture. When a shield is used it shall be an integral part of the door casting.

Lamp

Each fixture shall be furnished with a 85-W induction lamp. Interior lamp walls shall be fluorescent phosphor coated. Lamp light output shall be at least 70 percent at 60 000 hours. Lamps shall have a minimum color-rendering index of 80. Lamps shall be rated at a color temperature of 4000 K. Lamps shall be removable without the use of tools.

Power Coupler

Power couplers shall consist of a construction base with antenna, heat sink and electrical connection cable.

The power coupler shall be designed so that it can be removed with common hand tools.

High Frequency Generator

High frequency generators shall start and operate lamps at an ambient temperature of -25 °C or greater for the rated life of the lamp.

Generator output frequency shall be 2.65 MHz ± 10 percent. The generator radio frequency interference shall meet the requirements of the Federal Communications Commission Title 47, Part 18, regulations concerning harmful interference.

High frequency generators shall operate continuously at ambient air temperatures from -25 °C to +25 °C without reduction in generator life. High frequency generators shall have a design life of at least 100 000 hours at 55 °C.

High frequency generators shall be capable of being replaced with common hand tools. Conductor terminals shall be identified as to the component terminal to which they connect.

High frequency generators shall be mounted to use the fixture upon which they are mounted as a heat sink.

A Certificate of Compliance conforming to the provisions in Section 6-1.07, "Certificates of Compliance" of the Standard Specifications, and a copy of the high frequency generator test methods and results shall be submitted by the manufacturer with each lot of fixtures. The certificate shall state that the high frequency generators meet the requirements of this section and the generator specifications of the lamp manufacturer.

10-3.25 INTERNALLY ILLUMINATED SIGNS:

The "METER ON" sign shall be a Type A pedestrian signal and shall be the LED type.

The message shall be white "METER ON" as shown on the plans. White color shall be in conformance with the provisions in Section 86-4.06, "Pedestrian Signal Faces" of the Standard Specifications.

Lenses shall be 4.8-mm, minimum thickness, clear acrylic or polycarbonate plastic or 3-mm nominal thickness glass fiber reinforced plastic, with molded, one piece, neoprene gasket. Message lettering for "METER" shall be "Series C," 113-mm high, with uniform 13-mm stroke, and for "ON" shall be "Series C," 150-mm high, with uniform 25-mm stroke. Letters shall be clear, transparent or translucent, with black opaque background silk screened on to the second surface of the lens.

10-3.26 LED ILLUMINATED STREET NAME SIGNS (LED-ISNS) (City Locations):

The illuminated street name signs shall be illuminated with light emitting diodes. The signs shall be single-sided rigid mount Edge-Lit LED Street Name Signs, Model R409, as manufactured by Carmanah Technologies, Inc., or approved equal. The sign shall be level-mounted directly to the signal mast arm at its traditional position on the mast arm utilizing mounting hardware supplied by the sign manufacturer to accommodate leveling as needed, and installed in accordance with the sign manufacturer's instructions. The sign shall have the following characteristics:

A. White Ultrabrite LED lighting.
B. 3M Diamond grading reflective sheeting.
C. White letters on green (1177) background.
D. 8" uppercase letters, and 6" lowercase letters conforming to FHWA's "Standard Alphabets for Highway Signs".
E. Comply with AASHTO Standards for 110 MPH wind loading.

Manufacturer shall provide a detailed drawing of the sign for City approval prior to commencement of manufacturing. The signs shall be protected by fall arrestor cables; oversized sizes 8' long or longer and signs 24' tall or taller shall be mounted using two Pelco brackets in the vertical position rather than on Pelco bracket in the horizontal position.

Internally illuminated street name sign panel replacements, shall comply with the following requirements:

Sign legends shall be white on green, **3M VIP translucent**. Minimum copy size for the legends shall be Series C with Series D or E being used whenever message length permits.

Details of color, style, borders and spacing shall conform to the Standards established by Caltrans. **3M Scotchlite Diamond Grade Translucent VIP sheeting Series** 3990T, or approved equal, shall be used on the face of the sign. Abbreviations shall not be used except when the message length requires abbreviation and is subject to approval by the Engineer. "Periods" shall not be used on abbreviations. Full size layouts for each legend shall be submitted to the Engineer for approval prior to fabrication.

Full compensation, except as otherwise provided herein, for conforming to the requirements of this article shall be included in the contract lump sum price paid for Signal And Lighting (State Location 1 and 2), and no separate payment will be made therefor.

10-3.27 PHOTOELECTRIC CONTROLS:

Contactors shall be the mechanical armature type.

Photoelectric units for illuminated signs shall have a "turn-on" level of between 215 lux and 323 lux (corresponds to a switching level of approximately 430 lux to 646 lux measured in the horizontal plane). "Turn-off" level shall not exceed 3 times the "turn-on" level.

10-3.28 REMOVING, REINSTALLING OR SALVAGING ELECTRICAL EQUIPMENT:

Salvaged electrical materials shall be hauled to 175 Cluster Street, San Bernardino, CA 92402 and stockpiled.

The Contractor shall provide the equipment, as necessary, to safely unload and stockpile the material. A minimum notice of 2 business days shall be given prior to delivery.

10-3.29 REMOVING AND SALVAGING ELECTRICAL EQUIPMENT (City Locations):

Salvaged electrical materials shall be hauled to 3200 E Tahquitz Canyon Way, Palm Springs, CA 92262 and stockpiled.

10-3.30 WIRELESS CELLULAR DATA COMMUNICATIONS ASSEMBLY:

GENERAL

The wireless cellular data communications assembly shall consist of the Code Division Multiple Access (CDMA) modem,a dipole antenna, power supply/adapter for modem, interface cable between modem and 170E Controller, and modem mounting bracket. The wireless cellular data communications assembly shall provide wireless data transmission between the signal controller in the field and the Transportation Management Center (TMC).

CDMA Modem

The modem shall be product certified by the cellular provider.

RF Specifications

224 mW RF output (+23.5dBm).
Full duplex transceiver.
Dual band support for both 800 MHz and 1.9 GHz bands.
Adheres to CDMA authentication as specified in CDMA2000.

Antenna

The antenna shall meet the dual band requirements stated above.

Packet Mode Features

The modem shall support data rates up to 150kbs and 75 kbps.

DC Power Specifications

Advanced Power Management features.
Low power consumption.
Input Voltage: 10 VDC to 28 VDC.
Input Current: 40 mA to 200 mA.
Typical Receive: 200 mA at 12 VDC.
Typical Transmit: Approximatcly 200 mA at 12 VDC.
Dormant connection (idle for 10-20 seconds): 40 mA at 12 VDC.
The above power requirements shall be provided by an AC adapter or other approved devices.

Environmental

Operating ranges: -30°C to +70°C (10% duty cycle limit above 60°C).
Humidity: 5%-95% Non-condensing.

Physical Characteristica

Weight: Shall be less than 17 ounces.
Size: Not greater than 3 inchs wide x 1 inch high x 5 inchs long.
Status LEDs: Shall provide as a minimum indications for power, Received Signal Strength Indication (RSSI), and data transmission error.
RF Antenna Connector: 50 Ohm Terminal Node Controller (TNC).
Serial Interface: RS232 DB-9F.
Modem Mounting Bracket: Shall attach and secure the modem in the proximity of the 170E Controller C2 port within the 332 Controller Cabinet.

Interface Connection with 170E Controller

Interface cable shall conform with C2P modem interconnect harnessThe cable ends shall be C2P connector to the Model 170E controller and DB9 male connector to the external modem, with the following pin configurations as follow:

DB9M (to external modem)		**C2P (to Model 170E controller)**	
Function	Pin	Pin	Function
Transmit Data	3	K	Data In
Receive Data	2	L	Data Out
Signal Ground	5	N	Ground
Request to Send	7	J	Request to Send
Clear to Send	8	M	Clear to Send
Data Terminal Ready	4	H	Clear Detect

The Contractor shall provide the wireless cellular data communication assembly to the Engineer 10 days before the contractor will pickup the 332 cabinet so that State forces can install the assembly prior to the signal turn on.

Acceptance Testing

At the time of the signal turn on the wireless cellular data communication system will be tested by State forces to perform a loop test at the installation site by transmitting via a cellular device requesting data from the 170E Controller and monitoring the resulting return data. The test will be for a period of not less then 5 days of continuous, satisfactory operation.

WARRANTY

The Contractor shall provide a written warranty from the manufacturer against defects in materials and workmanship for wireless cellular data communication assembly for a period of 12 months after the acceptance test has been completed. Replacement of the wireless cellular data communication assembly shall be provided within 5 days after receipt of failed wireless cellular data communication assembly at no cost to the State, except the cost of shipping the failed parts. All warranty documentation shall be given to the Engineer at the time of delivering. Replacement parts of the wireless cellular data communication assembly shall be delivered to Caltrans Maintenance Electrical Shop at 175 Cluster Street, San Bernardino, CA. 92408.

Payment

Full compensation for wireless cellular data communication assembly shall be considered as included in the contract lump sum price for Signal And Lighting and no separate payment will be made therefor.

10-3.31 PAYMENT:

The contract lump sum price or prices paid for Signal And Lighting shall include highway lighting at intersections in connection with signals only.

Other roadway lighting on the project shall be considered as included in the contract lump sum price paid for Lighting And Sign Illumination.

Full compensation for hauling and stockpiling electrical materials shall be considered as included in the contract price paid for the item requiring the material to be salvaged and no additional compensation will be allowed therefor.

If any of the fabrication sites for the materials listed are located more than 480 air line kilometers from both Sacramento and Los Angeles, additional shop inspection expenses will be sustained by the State. Whereas it is and will be impractical and difficult to determine the actual increase in these expenses, it is agreed that payment to the Contractor for furnishing these listed materials from each fabrication site located more than 480 air line kilometers from both Sacramento and Los Angeles will be reduced $2000:

A. Service equipment enclosures.

SECTION 11. MODIFIED STANDARD SPECIFICATION SECTIONS
SECTION 11. (BLANK)

SECTION 12. WORK ZONE SAFETY AND MOBILITY WORK ZONE SAFETY AND MOBILITY

(Local Agency Information Only! As stated in Chapter 12 "Plans, Specifications, & Estimate" of the Caltrans "Local Assistance Procedures Manual," Title 23 Code of Federal Regulations (CFR), Part 630 –Subpart J "Work Zone Safety and Mobility" requires the implementation of a policy by a local agency for systematic consideration and management of work zone impacts on all Federal-aid highway projects. The policy may take the form of processes, procedures, and or/guidance, and may vary based on the characteristics and expected work zone impacts of individual projects or classes of projects. Each local agency may develop its own policy, choose to pattern their policy after Caltrans' policy, or choose to adopt a simple policy such as the following: *"To provide a smooth and efficient flow of traffic, while retaining safety through the roadway work zone."*)

A. POLICY: (Local Agency to complete)

(Local Agency Information Only! A Traffic Management Plan (TMP) is required for all Federal-aid construction projects, and needs to include a Temporary Traffic Control (TTC) plan that addresses traffic safety and control through the work zone. A **significant project** (as defined in 23 CFR §630.1010) is one that, alone or in combination with other concurrent projects nearby, is anticipated to cause sustained work zone impacts that are greater than what is considered tolerable based on agency policy and/or engineering judgment. If a project is expected to be *significant*, the Traffic Management Plan (TMP) for that project must also contain both Transportation Operations (TO) and Public Information (PI) components.)

B. TRAFFIC MANAGEMENT PLAN: (Local Agency to complete)
C. TEMPORARY TRAFFIC CONTROL PLAN: (Local Agency to complete)
1. Transportation Operations (Local Agency to include if a Significant Project)
2. Public Information: (Local Agency to include if a Significant Project)

OFFICE OF
CLERK OF THE BOARD OF SUPERVISORS
1st FLOOR, COUNTY ADMINISTRATIVE CENTER
P.O. BOX 1147, 4080 LEMON STREET
RIVERSIDE, CA 92502-1147
PHONE: (951) 955-1060
FAX: (951) 955-1071

KECIA HARPER-IHEM
Clerk of the Board of Supervisors

KIMBERLY A. RECTOR
Assistant Clerk of the Board

March 25, 2010

THE PRESS ENTERPRISE
ATTN: LEGALS
PO BOX 792
RIVERSIDE, CA 92501

VIA FAX (951) 368-9018
E-MAIL: legals@pe.com

RE: NOTICE INVITING BIDS: INDIAN CANYON AT INTERSTATE 10 (A8-0372)

To Whom It May Concern:

Attached is a copy for publication in your newspaper for **TEN (10) TIMES:**

Saturday	- March 27, 2010	Thursday	- April 1, 2010
Sunday	- March 28, 2010	Friday	- April 2, 2010
Monday	- March 29, 2010	Saturday	- April 3, 2010
Tuesday	- March 30, 2010	Sunday	- April 4, 2010
Wednesday	- March 31, 2010	Monday	- April 5, 2010

We require your affidavit of publication immediately upon completion of the last publication.

Your invoice must be submitted to this office in duplicate, WITH TWO CLIPPINGS OF THE PUBLICATION.

NOTE: PLEASE COMPOSE THIS PUBLICATION INTO A SINGLE COLUMN FORMAT.

Thank you in advance for your assistance and expertise.

Sincerely,

Mcgil
Cecilia Gil, Board Assistant to
KECIA HARPER-IHEM, CLERK OF THE BOARD

3.64 of 03-16-10

Gil, Cecilia

From: PE Legals [legals@pe.com]
Sent: Thursday, March 25, 2010 9:38 AM
To: Gil, Cecilia
Subject: RE: FOR PUBLICATION: BIDS for Indian Canyon at I-10

Received for publication from March 27 to April 5

Thank You! ~Maria G. Tinajero • The Press Enterprise Legal Adv. • 1.800.880.0345 (Phone) • 951.368.9018 (fax) • Please Note: Deadline is 10:30 AM two (2) business days prior to the date you would like to publish.

From: Gil, Cecilia [mailto:CCGIL@rcbos.org]
Sent: Thursday, March 25, 2010 9:23 AM
To: PE Legals
Subject: FOR PUBLICATION: BIDS for Indian Canyon at I-10

Good Morning! Attached is a Notice Inviting Bids, for publication from March 27 to April 5, 2010 (10) times. Please confirm. THANK YOU!

Cecilia Gil
Board Assistant to the
Clerk of the Board of Supervisors
951-955-8464

THE COUNTY ADMINISTRATIVE CENTER IS CLOSED EVERY FRIDAY UNTIL FURTHER NOTICE.
PLEASE CONSIDER THE ENVIRONMENT BEFORE PRINTING.

OFFICE OF
CLERK OF THE BOARD OF SUPERVISORS
1st FLOOR, COUNTY ADMINISTRATIVE CENTER
P.O. BOX 1147, 4080 LEMON STREET
RIVERSIDE, CA 92502-1147
PHONE: (951) 955-1060
FAX: (951) 955-1071

KECIA HARPER-IHEM
Clerk of the Board of Supervisors

KIMBERLY A. RECTOR
Assistant Clerk of the Board

March 25, 2010

THE DESERT SUN
ATTN: LEGALS
PO BOX 2734
PALM SPRINGS, CA 92263

VIA FAX (760) 778-4731
E-MAIL: legals@thedesertsun.com

RE: NOTICE INVITING BIDS: INDIAN CANYON AT INTERSTATE 10 (A8-0372)

To Whom It May Concern:

Attached is a copy for publication in your newspaper for **FIVE (5) TIMES:**

Wednesday	- March 31, 2010
Thursday	- April 1, 2010
Friday	- April 2, 2010
Saturday	- April 3, 2010
Sunday	- April 4, 2010

We require your affidavit of publication immediately upon completion of the last publication.

Your invoice must be submitted to this office in duplicate, WITH TWO CLIPPINGS OF THE PUBLICATION.

NOTE: PLEASE COMPOSE THIS PUBLICATION INTO A SINGLE COLUMN FORMAT.

Thank you in advance for your assistance and expertise.

Sincerely,

Mcgil

Cecilia Gil, Board Assistant to
KECIA HARPER-IHEM, CLERK OF THE BOARD

3.64 of 03-16-10

Gil, Cecilia

From: Moeller, Charlene [CMOELLER@palmspri.gannett.com]
Sent: Thursday, March 25, 2010 9:47 AM
To: Gil, Cecilia
Subject: RE: FOR PUBLICATION: BIDS Indian Canyon at I-10

Ad received and will publish on date(s) requested.

Charlene Moeller
Public Notice Customer Service Rep.
The Desert Sun Newspaper
750 N. Gene Autry Trail, Palm Springs, CA 92262
(760) 778-4578, Fax (760) 778-4731
Desert Sun legals@thedesertsun.com
& Desert Post Weekly dpwlegals@thedesertsun.com
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NOTE: Starting on March 29th, there will be a $10 affidavit processing fee added to the cost of each Public Notice

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From: Gil, Cecilia [mailto:CCGIL@rcbos.org]
Sent: Thursday, March 25, 2010 9:24 AM
To: tds-legals
Subject: FOR PUBLICATION: BIDS Indian Canyon at I-10

Good Morning! Attached is a Notice Inviting Bids, for publication from March 31 to April 4, 2010 (5 times). Please confirm. THANK YOU!

Cecilia Gil
Board Assistant to the
Clerk of the Board of Supervisors
951-955-8464

THE COUNTY ADMINISTRATIVE CENTER IS CLOSED EVERY FRIDAY UNTIL FURTHER NOTICE.
PLEASE CONSIDER THE ENVIRONMENT BEFORE PRINTING.

NOTICE TO BIDDERS

Sealed proposals will be received at the Riverside County Transportation Department, 14th Street Transportation Annex, 3525 14th Street, Riverside, California 92501, telephone (951) 955-6780 until 2:00 pm on April 28, 2010 at which time they will be publicly opened at said address, for construction in accordance with the specifications therefore, to which special reference is made, as follows: County of Riverside,

INDIAN CANYON DRIVE AT INTERSTATE 10
RECONSTRUCT OF INTERCHANGE
PROJECT NO. A8-0372
FEDERAL AID ESPLHPLU-5282 (034) & HP21L-5282 (035)

The UDBE Contract goal is 1.25 percent.

A pre-bid meeting is scheduled for 2:15 pm on April 7, 2010 at the County of Riverside Transportation Department, 3525 14th Street, Riverside, California 92501. This meeting is to inform bidders of project requirements and subcontractors of subcontracting and material supply opportunities. Bidder's attendance at this meeting is not mandatory.

THIS PROJECT IS SUBJECT TO THE "BUY AMERICA" PROVISIONS OF THE SURFACE TRANSPORTATION ASSISTANCE ACT OF 1982 AS AMENDED BY THE INTERMODAL SURFACE TRANSPORTATION EFFICIENCY ACT OF 1991.

Bids are required for the entire work described herein. The Contractor shall possess a current and active State of California Class "A" Contractor's license at the time this contract is awarded. The successful bidder shall furnish a payment bond and a performance bond.

This contract is subject to state contract nondiscrimination and compliance requirements pursuant to Government Code, Section 12990.

Inquiries or questions based on alleged patent ambiguity of the plans, specifications or estimate must be communicated as a bidder inquiry, in writing, prior to bid opening. Any such inquiries or questions, submitted after bid opening, will not be treated as a bid protest. Technical questions should be directed to the office of the County of Riverside Transportation Department, 3525 14th Street, Riverside, CA 92501, telephone (951) 955-6780, electronic mail: jrjimenez@rctlma.org.

Plans and specifications may be obtained for a NONREFUNDABLE FEE OF $200 PER FULL SIZE PLAN SET (or $100 PER SMALL SIZE PLAN SET [11"x17"]), plus mailing, and are available at 3525 14th Street, Riverside, CA 92501.

Engineering Estimate:	$ 25,000,000.00 - $29,000,000.00
Bid Bond	10%
Performance Bond	100%
Payment Bond	100%
Working Days	520 Days

http://www.rctlma.org/trans/bidadvertisements.html

Dated: March 25, 2010

Kecia Harper-Ihem, Clerk of the Board
By: Cecilia Gil, Board Assistant

THE PRESS-ENTERPRISE PE.com

Legal Advertising Invoice

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① BILLING PERIOD: 04/04/10 - 04/05/10
⑤ BILLING DATE: 04/05/10
㉓ TOTAL AMOUNT DUE: 1,742.40

⑫ ADVERTISING/CLIENT NAME: BOARD OF SUPERVISORS
FOR BILLING INFORMATION CALL: (951) 368-9713
* UNAPPLIED AMOUNT:
⑬ TERMS OF PAYMENT: Due Upon Receipt

⑭ PAGE NO: 1

⑧ BILLED ACCOUNT NAME AND ADDRESS

BOARD OF SUPERVISORS
COUNTY OF RIVERSIDE
P.O. BOX 1147
RIVERSIDE CA 92502

⑥ BILLED ACCOUNT NUMBER: 045202
REP NO: LE04

Statement #: 56533449 Amount Paid $_____ Your Check #_____

PLEASE DETACH AND RETURN UPPER PORTION WITH YOUR REMITTANCE

⑩ DATE	⑪ REFERENCE	⑫ ⑱ ⑭ DESCRIPTION-OTHER COMMENTS/CHARGES	⑮ SAU SIZE ⑯ BILLED UNITS	⑰ RATE	⑲ GROSS AMOUNT	㉑ NET AMOUNT
03/27	4170767 CO	NIB - INDIAN CANYON @ I-10 Class : 10 Ctext Ad# 10210472 Placed By : Cecilia Gil	144 L	1.30		187.20
03/28	4170767 CO	NIB - INDIAN CANYON @ I-10 Class : 10 Ctext Ad# 10210472 Placed By : Cecilia Gil	144 L	1.20		172.80
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04/01	4170767 CO	NIB - INDIAN CANYON @ I-10 Class : 10 Ctext Ad# 10210472 Placed By : Cecilia Gil	144 L	1.20		172.80
04/02	4170767 CO	NIB - INDIAN CANYON @ I-10 Class : 10 Ctext Ad# 10210472 Placed By : Cecilia Gil	144 L	1.20		172.80
04/03	4170767 CO	NIB - INDIAN CANYON @ I-10 Class : 10 Ctext Ad# 10210472 Placed By : Cecilia Gil	144 L	1.20		172.80
04/04	4170767 CO	NIB - INDIAN CANYON @ I-10 Class : 10 Ctext Ad# 10210472 Placed By : Cecilia Gil	144 L	1.20		172.80
04/05	4170767 CO	NIB - INDIAN CANYON @ I-10 Class : 10 Ctext Ad# 10210472 Placed By : Cecilia Gil	144 L	1.20		172.80

Transp.
3.64 of 03/16/10

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ADVERTISING
STATEMENT/INVOICE

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㉔ STATEMENT NUMBER	㉕ ADVERTISER INFORMATION			
	① BILLING PERIOD	⑥ BILLED ACCOUNT NUMBER	⑫ ADVERTISER/CLIENT NUMBER	⑫ ADVERTISER/CLIENT NAME
56533449	04/04/10 - 04/05/10	045202		BOARD OF SUPERVISORS

THE PRESS-ENTERPRISE

3450 Fourteenth Street
Riverside CA 92501-3878
951-684-1200
951-368-9018 FAX

PROOF OF PUBLICATION
(2010, 2015.5 C.C.P.)

Press-Enterprise

PROOF OF PUBLICATION OF

Ad Desc.: NIB - Indian Canyon @ I-10

I am a citizen of the United States. I am over the age of eighteen years and not a party to or interested in the above entitled matter. I am an authorized representative of THE PRESS-ENTERPRISE, a newspaper of general circulation, printed and published daily in the County of Riverside, and which newspaper has been adjudicated a newspaper of general circulation by the Superior Court of the County of Riverside, State of California, under date of April 25, 1952, Case Number 54446, under date of March 29, 1957, Case Number 65673 and under date of August 25, 1995, Case Number 267864; that the notice, of which the annexed is a printed copy, has been published in said newspaper in accordance with the instructions of the person(s) requesting publication, and not in any supplement thereof on the following dates, to wit:

03-27-10
03-28-10
03-29-10
03-30-10
03-31-10
04-01-10
04-02-10
04-03-10
04-04-10
04-05-10

I Certify (or declare) under penalty of perjury that the foregoing is true and correct.

Date: Apr. 5, 2010
At: Riverside, California

BOARD OF SUPERVISORS

P.O. BOX 1147
COUNTY OF RIVERSIDE
RIVERSIDE CA 92502

Ad #: 10210472

PO #:

Agency #: _____

Ad Copy:

NOTICE TO BIDDERS

Sealed proposals will be received at the Riverside County Transportation Department, 14th Street Transportation Annex, 3525 14th Street, Riverside, California 92501, telephone (951) 955-6780 until 2:00 pm on April 28, 2010 at which time they will be publicly opened at said address, for construction in accordance with the specifications therefore, to which special reference is made, as follows:
County of Riverside,

INDIAN CANYON DRIVE AT INTERSTATE 10
RECONSTRUCT OF INTERCHANGE
PROJECT NO. A8-0372
FEDERAL AID ESPLHPLU-5282 (034)
& HP21L-5282 (035)

The UDBE Contract goal is 1.25 percent.

A pre-bid meeting is scheduled for 2:15 pm on April 7, 2010 at the County of Riverside Transportation Department, 3525 14th Street, Riverside, California 92501. This meeting is to inform bidders of project requirements and subcontractors of subcontracting and material supply opportunities. Bidder's attendance at this meeting is not mandatory.

THIS PROJECT IS SUBJECT TO THE "BUY AMERICA" PROVISIONS OF THE SURFACE TRANSPORTATION ASSISTANCE ACT OF 1982 AS AMENDED BY THE INTERMODAL SURFACE TRANSPORTATION EFFICIENCY ACT OF 1991.

Bids are required for the entire work described herein. The Contractor shall possess a current and active State of California Class "A" Contractor's license at the time this contract is awarded. The successful bidder shall furnish a payment bond and a performance bond.

This contract is subject to state contract nondiscrimination and compliance requirements pursuant to Government Code, Section 12990.

Inquiries or questions based on alleged patent ambiguity of the plans, specifications or estimate must be communicated as a bidder inquiry, in writing, prior to bid opening. Any such inquiries or questions, submitted after bid opening, will not be treated as a bid protest. Technical questions should be directed to the office of the County of Riverside Transportation Department, 3525 14th Street, Riverside, CA 92501, telephone (951) 955-6780, electronic mail: jrjimenez@rctlma.org.

Plans and specifications may be obtained for a NON-REFUNDABLE FEE OF $200 PER FULL SIZE PLAN SET (or $100 PER SMALL SIZE PLAN SET [11"x17"]), plus mailing, and are available at 3525 14th Street, Riverside, CA 92501.

Engineering Estimate: $ 25,000,000.00 - $29,000,000.00	
Bid Bond	10%
Performance Bond	100%
Payment Bond	100%
Working Days	520 Days

http://www.rctlma.org/trans/bidadvertisements.html

Dated: March 25, 2010
Kecia Harper-Ihem, Clerk of the Board
By: Cecilia Gil, Board Assistant 3/27 - 4/5

The Desert Sun

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ADVERTISING INVOICE/STATEMENT

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132

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RIVERSIDE COUNTY-BOARD OF SUP.
PO BOX 1147
RIVERSIDE CA 92502-1147

PLEASE RETURN THIS TOP SECTION WITH PAYMENT IN THE ENCLOSED ENVELOPE AND INCLUDE YOUR CUSTOMER NUMBER ON REMITTANCE.

Customer No.	Invoice No.
RIV069	0003735665
For the Period	Thru
03/29/10	05/02/10
Due Date	**Amount Due**
05/17/10	**12,697.95**
AMOUNT PAID	

Date	EDT	Class	Description	Times Run	Col	Depth	Total Size	Rate	Amount
0329			BALANCE FORWARD						4,965.04
0320	CLS	0001	SANDI SCHLEMNO 1190 / RES 20	3	5	21.00	315.00		3,772.35
0331	CLS	0001	CECILIA NO 1338 NOTICE T	12	2	83.00	1992.00		704.90
0403	CLS	0001	CECILIA NO 1427 NOTICE I	9	2	79.00	1422.00		278.28
0409	DLY		SENIOR INSPIRATION AWARDS	1	3	10.00	30.00		500.00
0414	CLS	0001	CECILIA NO 1529 NOTICE I	10	2	49.00	980.00		422.70
0416	CLS	0001	CECILIA NO 1579 NOTICE O	2	2	316.00	1264.00		540.56
0418	DLY		SENIOR INSPIRATION AWARDS	1	3	10.00	30.00		500.00
0423	CLS	0001	CECILIA NO 1692 NOTICE O	2	2	101.00	404.00		183.66
0424	CLS	0001	CECILIA NO 1699 NOTICE O	2	2	246.00	984.00		424.36
0428	CLS	0001	CECILIA NO 1730 NOTICE I	10	2	47.00	940.00		406.10

RECEIVED RIVERSIDE COUNTY CLERK / BOARD OF SUPERVISORS
2010 MAY 10 PM 3:55

Current	Over 30 Days	Over 60 Days	Over 90 Days	Over 120 Days	**Total Due**	
7,732.91	1,730.86	3,044.68	.00	189.50	**12,697.95**	
Contract Type	Contract Qnty.	Expiration Date	Current Usage	Total Used	Quantity Remaining	Salesperson
						MOELLER

The Advertiser shall make payment within 15 days of the billing date indicated on Company's statement, and, in the event that it fails to make payment within such time, Company may eject advertising copy and / or immediately cancel this contract and Advertiser agrees to indemnify Company for all expenses incurred in connection with the collection of amounts payable under this contract, including but not limited to collection fees, attorney's fees and court costs. If this agreement is cancelled due to Advertiser's failure to make timely payment, Company may rebill the Advertiser for the outstanding balance due at the open or earned contract rate, whichever is applicable.

TO ENSURE PROPER CREDIT, PLEASE RETURN THE TOP SECTION AND INCLUDE YOUR CUSTOMER NUMBER ON REMITTANCE.

Customer Number	Name	Invoice Number	Amount Paid
RIV069	RIVERSIDE COUNTY-BOARD OF SUP.	0003735665	

THE DESERT SUN PUBLISHING CO.
ADVERTISING INVOICE/STATEMENT

3.64 of 03/16/10

PROOF OF PUBLICATION
(2015.5.C.C.P)

This is space for County Clerk's Filing Stamp

STATE OF CALIFORNIA
County of Riverside

I am a citizen of the United States and a resident of the County aforesaid; I am over the age of eighteen years, and not a party to or interested in the above-entitled matter. I am the principal clerk of a printer of the, DESERT SUN PUBLISHING COMPANY a newspaper of general circulation, printed and published in the city of Palm Springs, County of Riverside, and which newspaper has been adjudged a newspaper of general circulation by the Superior Court of the County of Riverside, State of California under the date of March 24, 1988. Case Number 191236; that the notice, of which the annexed is a printed copy (set in type not smaller than non pariel, has been published in each regular and entire issue of said newspaper and not in any supplement thereof on the following dates, to wit:

March 31st, April 1st, 2nd, 3rd, 4th, 2010

All in the year 2010

I certify (or declare) under penalty of perjury that the foregoing is true and correct.

Dated at Palm Springs, California this ---5th, ---- day of---------- April ----------, 2010

Signature

Proof of Publication of

No 1338

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Dated: March 25, 2010
Kecia Harper-Ihem, Clerk of the Board
By: Cecilia Gil, Board Assistant

Published: 3/31, 4/1, 4/2, 4/3,4/4/10