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Be energy efficient!*

July 16, 2009

02-Sha-5-R63.2/R65.8
02-378904
ACBRNH-0058(337)N

Addendum No. 3

Dear Contractor:

This addendum is being issued to the contract for CONSTRUCTION ON STATE HIGHWAY IN SHASTA COUNTY NEAR LAKEHEAD FROM 0.3 KM NORTH OF ANTLER SUMMIT OVERCROSSING TO 0.5 KM NORTH OF ANTLER UNDERPASS.

Submit bids for this work with the understanding and full consideration of this addendum. The revisions declared in this addendum are an essential part of the contract.

Bids for this work will be opened on Tuesday, August 4, 2009.

This addendum is being issued to revise the Project Plans, the Notice to Bidders and Special Provisions, the Bid book, the Information Handout, and the Federal Minimum Wage Modification No. 32 dated 7-10-09.

Project Plan Sheets 37, 38, 39, 41, 42, 365, 366, 369, 370, 371, 372, 373, 374, 375, 376 and 377 are revised. Half-sized copies of the revised sheets are attached for substitution for the like-numbered sheets.

In the Special Provisions, Section 2-1.02, "ESCROW OF BID DOCUMENTATION," is added as attached.

In the Special Provisions, Section 5-1.09, "SUPPLEMENTAL PROJECT INFORMATION," is revised as attached.

In the Special Provisions, Section 5-1.14, "BIOLOGICAL MONITOR," the following paragraphs are added after the second paragraph:

"Basic measures to prevent the spread of aquatic invasive species are:

1. Inspect all equipment and materials arriving at the site that had been in contact with freshwater or saltwater and remove all visible aquatic remnants (plants, seeds, mud, soil, and animals). Equipment shall be power washed, and air dried for at least 7 days.
2. Water shall be drained from equipment and materials where water may be trapped, such as tanks, pumps, hoses, silt curtains, and water-retaining components of boats and barges.
3. Debris and water from the cleaning process must be contained in an upland area and not allowed to enter surface waters.
4. The biological monitor shall prepare a log of equipment and materials inspected and cleaned. The log shall be submitted daily to the Engineer.

Additional information regarding aquatic invasive species and accepted protocol for preventing the spread of invasive species in California water bodies is located at:

[www.dfg.ca.gov/invasives/quaggamussel/.](http://www.dfg.ca.gov/invasives/quaggamussel/)"

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In the Special Provisions, Section 8-1.06, "SELF-CONSOLIDATING CONCRETE," is added as attached.

In the Special Provisions, Section 10-1.01, "ORDER OF WORK," the first sentence of the second paragraph is revised as follows:

"A continuous construction presence shall be in effect without interruption starting sometime between August 15 and December 1 of the first year of the contract and ending when the project is complete."

In the Special Provisions, Section 10-1.39, "EXISTING HIGHWAY FACILITIES," subsection "BRIDGE REMOVAL," the following paragraph is added after the first paragraph:

"The Contractor may place bridge steel structural members in the water during demolition."

In the Special Provisions, Section 10-1.42, "EARTHWORK," the following paragraph is added after the third paragraph:

"Concrete placed in embankments shall be buried deeper than 2.1 m below the grading plane."

In the Special Provisions, Section 10-1.62, "PILING," subsection "LOAD TEST PILES," the third paragraph is deleted.

In the Special Provisions, Section 10-1.62, "PILING," subsection "CONSTRUCTION," the following paragraph is added after the first paragraph:

"The gamma test tubes shall extend to the top plate of the O-cell. In addition to these requirements, concrete slump shall exceed 180 mm at all times."

In the Special Provisions, Section 10-1.62, "PILING," subsection "CONSTRUCTION," item one under the tenth paragraph is revised as follows:

"1. Potable water from unopened plastic containers to mix with a water-soluble oil provided by manufacturer of the load cells."

In the Special Provisions, Section 10-1.62, "PILING," subsection "CONSTRUCTION," item ten under the tenth paragraph is revised as follows:

"10. Equipment and labor sufficient to erect the protected work area, and reference system, including equipment capable of holding the bar reinforcing cage off of the bottom of the hole during concrete placement."

In the Special Provisions, Section 10-1.62, "PILING," subsection "CONSTRUCTION," the eleventh paragraph is revised as follows:

"Load testing of the load test pile shall not begin until the concrete has attained a compressive strength of 50 MPa as approved by the Engineer."

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In the Special Provisions, Section 10-1.62, "PILING," subsection "CONSTRUCTION," the sixteenth paragraph is revised as follows:

"At least 24 concrete test cylinders shall be made from the concrete used in the load test pile. Testing of cylinders shall be by the Contractor's independent laboratory. Results shall be reported to the Engineer within 24 hours of each test performed. At least four of these test cylinders shall be tested for compressive strength prior to the load test and at least four cylinders shall be tested on the day of the load test. In addition, the modulus of elasticity of the concrete shall be determined by testing four cylinders each at 3 and 7 days after placement and eight on days of testing. Elastic modulus testing shall be in accordance with the requirements of ASTM C 469, and the cylinders shall be moist cured until testing."

In the Special Provisions, Section 10-1.62, "PILING," subsection "TESTING AND REPORTING," the first paragraph is revised as follows:

"The load testing shall be performed by a qualified Geologist or Civil Engineer, as provided by the manufacturer of the load cells."

In the Special Provisions, Section 10-1.62, "PILING," subsection "TESTING AND REPORTING," the second paragraph is revised as follows:

"The load testing shall be performed in general compliance with the requirements of ASTM Designation: D 1143 (Quick Test Method). Initially the loads shall be applied in increments equaling 8 to 10 percent of the rated O-cell capacity or the anticipated ultimate capacity of the pile. The increments shall not be more than 10 percent of the rated capacity of the O-cell. The magnitude of the load increments may be increased or decreased depending on actual load test pile capacity, and as approved by the Engineer."

In the Special Provisions, Section 10-1.62, "PILING," subsection "TESTING AND REPORTING," the third paragraph is revised as follows:

"Direct movement indicator measurements shall be made of the following: cell expansion (4 LVWDTs or LVDTs or digital dial gages per cell assembly), top of load test pile movement (2 LVWDTs or LVDTs or digital dial gages), and continuous compression measurements of the load test pile (4 LVWDTs or LVDTs or digital dial gages)."

In the Special Provisions, Section 10-1.62, "PILING," subsection "TESTING AND REPORTING," item one under the fifth paragraph is revised as follows:

"1. Construct the load test pile as shown on the plans. Place 3 sets of 4 strain gages (12 total) along the reinforcing steel cage of the rock socket as recommended by the manufacturer and as approved by the Engineer."

In the Special Provisions, Section 10-1.62, "PILING," subsection "TESTING AND REPORTING," the eighth paragraph is revised as follows:

"The reference system selected shall be firmly supported on HP310 pile foundations. The reference system elevations shall be monitored and recorded at all times during testing through the use of electronic surveying instruments. Alternatively, if conditions allow, the top of shaft will be measured directly with digital survey levels from a distance of approximately 15 m."

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In the Special Provisions, Section 10-1.62, "PILING," subsection "TESTING AND REPORTING," paragraphs ten, eleven and twelve are replaced with the following paragraph:

"A final report, that contains the Engineer's comments and the Contractor's replies to the comments on the load testing, shall be submitted to the Engineer within 2 weeks after completion of all pile load testing."

In the Special Provisions, Section 10-1.63, "AQUATIC SOUND ATTENUATION SYSTEM," subsection "WORKING DRAWINGS," the following is added:

"Cost Break-Down

The cost break-down shall conform to the provisions in Section 86-1.03, "Cost Break-Down," of the Standard Specifications and to these special provisions.

Furnish a cost break-down for the contract lump sum item of aquatic sound attenuation system.

The cost break-down shall be submitted to the Engineer for approval with the working drawings and shall follow the same approval timeline. The cost break-down shall be approved, in writing, by the Engineer before any partial payment for the item of aquatic sound attenuation system will be made.

The cost break-down shall include the following items:

1. Working drawing preparation.
2. Installation, inspection, maintenance, and removal of the system at each location."

In the Special Provisions, Section 10-1.65, "CONCRETE STRUCTURES," subsection "SOFFIT OPENING HATCH," is replaced with the following:

"Soffit opening hatch, consisting of a factory fabricated floor hatch with keyed lock handles and accessories, shall conform to the details shown on the plans, the manufacturers recommendations, and these special provisions.

The Contractor can select a factory fabricated soffit opening hatch that conforms to the details shown on the plans and these special provisions from one of the following manufacturers, or equal:

ACUDOR Products Inc.

www.acudor.com

800-722-0501

Bilco

www.bilco.com

203-934-6363

The Williams Brothers Corporation of America

www.wbdoors.com

800-255-5515

The Contractor shall submit technical data and manufacturer's specifications for the floor hatch and a proposed plan for installing the soffit access hatch system. This plan shall be submitted to the Engineer for approval at least 20 days prior to placing the soffit concrete.

Floor hatch shall be designed for a 142 MPa live load and constructed of aluminum with stainless steel hardware and hinges. Aluminum surfaces shall be milled finished. The floor hatches shall have a cylinder lock in exterior handle. All locks shall be keyed the same. Twelve sets of keys shall be provided to the Engineer at the completion of the project.

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Stainless steel hardware and hinges shall conform to the requirements of ASTM Designation: A 240, Type 316. Hinges shall have a thickness of 10 mm.

Expansion anchors shall conform to the provisions in Section 75-1.03, "Miscellaneous Bridge Metal," of the Standard Specifications and as shown on the plans."

In the Special Provisions, Section 10-1.65, "CONCRETE STRUCTURES," subsection "COST REDUCTION INCENTIVE PROPOSALS FOR CAST-IN-PLACE PRESTRESSED BOX GIRDER BRIDGES," the eleventh paragraph is revised as follows:

"Modifications may be proposed in (1) the thickness of girder stems and deck slabs, (2) the number of girders, (3) the amount and location of reinforcing steel, (4) the amount and location of prestressing force in the superstructure, and (5) the number of hinges, except that the number of hinges shall not be increased. The strength of the concrete used may be increased but the strength employed for design or analysis shall not exceed 48 MPa for superstructure and piers and 42 MPa for cast-in-drilled-hole piles."

In the Special Provisions, Section 10-1.65, "CONCRETE STRUCTURES," subsection "COST REDUCTION INCENTIVE PROPOSALS FOR CAST-IN-PLACE PRESTRESSED BOX GIRDER BRIDGES," the thirteenth paragraph is revised as follows:

"No modifications will be permitted in (1) the foundation type, (2) the span lengths or (3) the exterior dimensions of columns or bridge superstructure. Fixed connections at the tops and bottoms of columns shown on the plans shall not be eliminated."

In the Special Provisions, Section 10-1.65, "CONCRETE STRUCTURES," subsection "MEASUREMENT AND PAYMENT," the sixth paragraph is revised as follows:

"The contract price paid per unit for soffit opening hatch shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in installing soffit opening hatches, complete in place, including furnishing and installing floor hatch, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer."

In the Special Provisions, Section 10-1.66, "CAST-IN-PLACE PRESTRESS SEGMENTAL BOX GIRDER SUPERSTRUCTURE," subsection "WORKING DRAWINGS," the second paragraph is revised as follows:

"The Contractor's attention is directed to "Project Specific Design Criteria" of these special provisions. The "Project Specific Design Criteria" shall apply when developing working drawings for the structure."

In the Special Provisions, Section 10-1.66, "CAST-IN-PLACE PRESTRESS SEGMENTAL BOX GIRDER SUPERSTRUCTURE," subsection "A. GEOMETRY CONTROL MANUAL," item 7 is added to the list after the fifth paragraph as follows:

"7-Deformation of columns and temporary supports."

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In the Special Provisions, Section 10-1.66, "CAST-IN-PLACE PRESTRESS SEGMENTAL BOX GIRDER SUPERSTRUCTURE," subsection "PRESTRESSING AND GROUTING," the third paragraph is revised as follows:

"Prestressing steel for transverse post tensioning may be stressed with a monostrand jack for tendons with 4 strands or less. Bundled ducts shall be grouted simultaneously to avoid cross grouting. Blind or fixed anchorages shall not be used for prestressing tendons. After stressing and before grouting internal or external tendons, the Contractor shall perform a duct pressure field test according the following requirements. After installing all grout caps, inlets and outlets, the tendon shall be tested with compressed air to determine if duct connections require repair. In the presence of the Engineer, pressurize the tendon to 344 kPa and lock-off the outside air source. Record pressure loss for one minute. A pressure loss of 172 kPa is acceptable for tendons having a length of equal to or less than 45 m and a pressure loss of 103 kPa is acceptable for tendons longer than 45 m. If the pressure loss exceeds the allowable, repair leaking connections using methods approved by the Engineer and retest."

In the Special Provisions, Section 10-1.66, "CAST-IN-PLACE PRESTRESS SEGMENTAL BOX GIRDER SUPERSTRUCTURE," subsection "TESTING," the following paragraph is added after the second paragraph:

"The coefficient of thermal expansion, determined by AASHTO test number TP60-00, shall be less than $11 \times 10^{-6}/^{\circ}\text{C}$. Result data from the test shall be submitted to the Engineer."

In the Special Provisions, Section 10-1.66, "CAST-IN-PLACE PRESTRESS SEGMENTAL BOX GIRDER SUPERSTRUCTURE," subsection "CREEP TEST," is revised as follows:

"Creep tests for each structure shall be performed by the Contractor and shall be in accordance with the requirements of ASTM C 512. Ages of cylinders at time of initial loading shall be 3, 28 and 90 days. The number of cylinders per test shall be three for loading and two each for control and compressive strength specimens. The duration of load shall be 180 days. Cylinders shall be cured and stored in accordance with the standard curing requirements of Section 6.1 of ASTM C 512, except that the cylinders shall be moist cured for a period of 14 days or until age of test, whichever comes first. Thereafter, cylinders shall be stored at 23°C and 50 percent humidity. In addition to the first creep tests that are used in developing the casting curve, the Contractor shall perform three additional creep and shrinkage tests for each structure. Result data from those tests shall be submitted to the Engineer within one week from the time of the performance of the test."

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In the Special Provisions, Section 10-1.72, "ARCHITECTURAL SURFACE (TEXTURED CONCRETE)," subsection "TEST PANEL," the first paragraph is revised as follows:

"A test panel, for each type of architectural texture, shall be successfully completed at a location approved by the Engineer before beginning work on architectural textures. The test panels for the bass relief texture shall include all of the various textures found on the bass shown on the plans. In addition and prior to the test panel requirement for the bass relief texture, detailed working drawings, including details for adjoining liners, shall be submitted for approval in conformance with the provisions in Section 5-1.02, "Plans and Working Drawings," of the Standard Specifications. The review time shall be the same as those specified for falsework working drawings in Section 51-1.06A, "Falsework Design and Drawings," of the Standard Specifications. The test panels shall be constructed and finished with the materials, tools, equipment and methods to be used in constructing the architectural texture. If ordered by the Engineer, additional test panels shall be constructed and finished until the specified finish, texture and color are obtained, as determined by the Engineer. The completed test panels, following review and acceptance by the Architect will be approved in writing by the Engineer and shall be supported in a vertical position and left at the construction site for viewing."

In the Special Provisions, Section 10-1.90, "MISCELLANEOUS METAL (BRIDGE)," the third paragraph is revised as follows:

"Miscellaneous metal (bridge) 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. Maintenance stair, platforms, and associated metal items
- B. Trolley rail and associated hardware
- C. Utility deviators and associated hardware"

In the Special Provisions, Section 10-1.90, "MISCELLANEOUS METAL (BRIDGE)," the following paragraphs are added:

"Prior to ordering or fabricating any of the miscellaneous bridge metal items listed above, the Contractor shall submit working drawings, for all the materials and work associated with those items, to the Office of Structure Design for approval in conformance with the provisions in Section 5-1.02, "Plans and Working Drawings." For initial review, 3 sets of the drawings shall be submitted. After review, between 6 and 10 sets, as requested by the Engineer, shall be submitted to the Office of Structure Design for final approval and for use during Construction.

The working drawings shall show details of any permitted options proposed in the work, details for connections not dimensioned on the plans, the sequence of shop and field assembly and erection, welding sequences and procedures, the location of all butt welded splices on a layout drawing of the entire structure, and the location of any temporary supports that are to be used.

Working drawings shall be submitted sufficiently in advance of the start of the affected work to allow time for review by the Engineer and correction by the Contractor of the drawings without delaying the work. The time shall be proportional to the complexity of the work, but in no case shall the time be less than 3 weeks.

Floor grating and grating bearing bars, where shown on the plans, shall be of a commercial quality, heavy duty galvanized steel. Floor grating shall be serrated, slip resistance walking surfaces and shall have a capacity of 1000 mm of unsupported span length, a uniform load of 490 kg/m², and a concentrated load of 750 kg per meter of width."

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In the Special Provisions, Section 10-1.90, "MISCELLANEOUS METAL (BRIDGE)," the following subsection is added:

"STEEL WORK PLATFORMS

Steel work platforms at piers 2 and 5 shall conform to the details shown on the plans, the manufacturers recommendations, and the provisions for miscellaneous bridge metal in Section 75, "Miscellaneous Metal," of the Standard Specification.

The contract price paid per unit for steel work platform shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in installing steel work platforms at piers 2 and 5, complete in place, including furnishing and installing steel work platforms as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer."

In the Special Provisions, Section 10-3.15, "HIGHWAY ADVISORY RADIO SYSTEM," is revised as attached.

In the Bid book, in the "Bid Item List," Item 147 is revised as attached.

To Bid book holders:

Replace page 10 of the "Bid Item List" in the Bid book with the attached revised page 10 of the Bid Item List. The revised Bid Item List is to be used in the bid.

Attached are copies of additions or revisions to existing Information Handouts:

1. "Agreement to Amend Lake or Streambed Alteration Agreement No. R1-08-0093".
2. Substitute "Project Specific Design Criteria" for the existing "Project Specific Design Criteria".
3. Substitute "Optional Stockpile Sites" for the existing "Optional Earthwork Stockpile Site Locations".
4. Lab results for the unconfined compressive strength test done at Antlers B-12.
5. "Existing Topographic Information" sheets.
6. "Water Pollutant Screening Laboratory Results".

Inquiries or questions in regard to this addendum must be communicated as a bidder inquiry and must be made as noted in the Notice to Bidders section of the Notice to Bidders and Special Provisions.

Indicate receipt of this addendum by filling in the number of this addendum in the space provided on the signature page of the Bid book.

Submit bids in the Bid book you now possess. Holders who have already mailed their book will be contacted to arrange for the return of their book.

Inform subcontractors and suppliers as necessary.

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This office is sending this addendum by GSO overnight mail to Bid book holders to ensure that each receives it. A copy of this addendum and the modified wage rates are available for the Contractors' use on the Web site:

http://www.dot.ca.gov/hq/esc/oe/weekly_ads/addenda.php

If you are not a Bid book holder, but request a book to bid on this project, you must comply with the requirements of this letter before submitting your bid.

Sincerely,

ORIGINAL SIGNED BY

REBECCA D. HARNAGEL, Chief
Office of Plans, Specifications & Estimates
Division of Engineering Services - Office Engineer

Attachments

2-1.02 ESCROW OF BID DOCUMENTATION

Bid documentation shall consist of all documentary and calculated information generated by the Contractor in preparation of the bid. The bid documentation shall conform to the requirements in these special provisions, and shall be submitted to the Department and held in escrow for the duration of the contract.

The escrowed bid documents will be the only documents accepted from the Contractor regarding preparation of the bid.

In signing the proposal, the bidder certifies that the material submitted for escrow constitutes all the documentary information used in preparation of the bid, that he has personally examined the contents of the container, and that they are complete.

The first, second and third apparent low bidders shall submit to the Department of Transportation, North Region Construction Duty Senior, 703 B Street, Marysville, CA 95901, (530) 741-4388, fax (530) 822-4324 the identification of the bidder's representative authorized to present the bid documentation and the persons responsible for preparing the bidder's estimate before the close of business on the first Monday after bid opening.

Nothing in the bid documentation shall be construed to change or modify the terms or conditions of the contract.

Escrowed bid documentation will not be used for pre-award evaluation of the Contractor's anticipated methods of construction, nor to assess the Contractor's qualifications for performing the work.

Bid documentation shall clearly itemize the Contractor's estimated costs of performing the work. The documentation submitted shall be complete and so detailed as to allow for an in-depth analysis of the Contractor's estimate.

The Contractor shall submit its bid documentation which shall include, but not be limited to:

1. quantity takeoffs;
2. rate schedules for the direct costs and the time- and nontime-related indirect costs for
 - 2.1. labor (by craft),
 - 2.2. plant and equipment ownership and operation,
 - 2.3. permanent and expendable materials,
 - 2.4. insurance and subcontracted work;
3. estimated construction schedules, including sequence and duration and development of production rates;
4. quotations, terms and limitations of quotes and subcontracts related to subcontractors, manufacturers and suppliers;
5. estimates of field and home office overhead;
6. contingency and margin for each contract item of work;
7. names of the persons responsible for preparing the bidder's estimate, and other reports, calculations, assumptions and supplemental information used by the bidder to arrive at the estimate submitted with the proposal;
8. bid documentation for each subcontractor, manufacturer and supplier whose subcontract or purchase orders exceed or are expected to exceed \$250,000.00. Bid documentation for other subcontractors, manufacturers, and suppliers may be submitted, if required by the Contractor, or requested by the subcontractor, manufacturer, or supplier.

If required by the Contractor or requested by the subcontractor, manufacturer, or supplier, additional information may be submitted by the subcontractor, manufacturer, or supplier. Subcontractor, manufacturer and supplier bid documentation shall conform to the requirements for the Contractor's documentation and shall be enclosed with the Contractor's submittal regardless of whether or not subcontracts or purchase orders have been executed or entered into on the date that bid documentation is submitted for escrow. If at the time that bid documentation is submitted for escrow, the subcontractor, manufacturer or supplier does not have an executed subcontract or purchase order, and a subcontract or purchase order is subsequently executed, then a copy of the executed subcontract or purchase order shall be submitted into escrow within 14 days of the execution of the respective subcontract or purchase orders. The examination of subcontractors', manufacturers' and suppliers' bid documentation will be accomplished in the same manner as for the Contractor's bid documentation. If a subcontractor, manufacturer or supplier is replaced, bid documentation for the new subcontractor, manufacturer or supplier shall be submitted for review and escrow before authorization for the substitution will be granted. Upon written request of a subcontractor, manufacturer or supplier, the bid documentation from that subcontractor, manufacturer or supplier shall be reviewed only by the subcontractor, manufacturer or supplier and the Department and shall be placed in a separate container within the Contractor's container. The written request from the subcontractor, manufacturer or supplier shall be included with the bid documentation.

If the bidder is a joint venture, the bid documentation shall include the joint venture agreement, the joint venture estimate comparison and final reconciliation of the joint venture estimate.

Copies of the proposals submitted by the first, second and third low bidders will be provided to the first, second, and third apparent low bidders by the District for inclusion in the bid documentation to be escrowed.

The first, second, and third apparent low bidders shall present the bid documentation for escrow at the office of the North Region Construction Duty Senior, 703 B Street, Marysville, CA 95901, (530) 741-4388 on the first Tuesday between 1:00 p.m. and 2:00 p.m., following the time indicated in the "Notice to Contractors" for the opening of bids. The fourth and subsequent apparent low bidders shall present the bid documentation for escrow if requested by the Department to do so.

Bid documentation shall be submitted as a paper copy in a sealed container, clearly marked with the bidder's name, date of submittal, project contract number and the words, "Bid Documentation for Escrow."

Failure to submit the actual and complete bid documentation as specified herein within the time specified shall be cause for rejection of the proposal.

Upon submittal, the bid documentation of the apparent low bidder will be examined and inventoried by the duly designated representatives of the Contractor and the Department to ensure that the bid documentation is authentic, legible, and in accordance with the terms of this section "Escrow of Bid Documentation." The examination will not include review of, nor will it constitute approval of, proposed construction methods, estimating assumptions or interpretation of the contract. The examination will not alter any conditions or terms of the contract. The acceptance or rejection by the Department that the submitted bid documents are in compliance with this section, "Escrow of Bid Documentation," shall be completed within 48 hours of the time the bid documentation is submitted by the Contractor.

At the completion of the examination, the bid documents will be sealed and jointly deposited at an agreed commercial business in Marysville, CA.

Bid documentation submitted by the second and third apparent low bidders will be jointly deposited at an agreed commercial business in Marysville, CA. If the apparent low bid is withdrawn or rejected, the bid documentation of the second low bidder will be examined and inventoried in the manner specified above, then sealed and deposited again in escrow. If the second low bid is withdrawn or rejected, the bid documentation of the third low bidder will be examined and inventoried in the manner specified above, then sealed and deposited again in escrow. Bid documentation from subsequent bidders, if requested, will be examined and inventoried in the same manner as specified above, then sealed and deposited in escrow. Upon execution and final approval of the contract or rejection of all bids, the bid documentation will be returned to any remaining unsuccessful bidders.

Any and all components of the escrowed bid documentation may be examined by the designated representatives of both the Department and the Contractor, at any time deemed necessary by either the Department or the Contractor to assist in the negotiation of price adjustments and change orders, or to assist in the potential resolution or in the settlement of claims or disputes. Such a joint review shall be performed within 15 days of receipt of a written request to do so by either party. If the Contractor refuses to participate in the joint examination of any and all components of the escrowed bid documentation as provided herein, such refusal shall be considered as a failure by the Contractor to exhaust administrative claim remedies with respect to the particular protest, notice of potential claim, or claim. In addition, this refusal by the Contractor shall constitute a bar to future arbitration with respect to the protest, potential claim or claim as provided by Section 10240.2 of the California Public Contract Code.

If requested by a Disputes Review Board, the escrowed bid documentation may be utilized to assist the Board in its recommendations.

The bid documentation submitted by the Contractor will be held in escrow until the contract has been completed, the ultimate resolution of all disputes and claims has been achieved and receipt of final payment has been accepted by the Contractor. The escrowed bid documentation will then be released from escrow to the Contractor.

The bid documentation submitted by the bidder is, and shall remain, the property of the bidder, and is subject to only joint review by the Department and the bidder or upon written request of a subcontractor, manufacturer or supplier shall be reviewed only by the subcontractor, supplier or manufacturer and the Department unless it involves a dispute or claim. The Department stipulates and expressly acknowledges that the submitted bid documentation constitutes trade secrets and will not be deemed public records. This acknowledgment is based on the Department's express understanding that the information contained in the bid documentation is not known outside the bidder's business, is known only to a limited extent and only by a limited number of employees of the bidder, is safeguarded while in the bidder's possession, is extremely valuable to the bidder and could be extremely valuable to the bidder's competitors by virtue of it reflecting the bidder's contemplated techniques of construction. The Department acknowledges that the bid documentation includes a compilation of information used in the bidder's business, intended to give the bidder an opportunity to obtain an advantage over competitors who do not know of or use the contents of the documentation. The Department agrees to safeguard the bid documentation, and all information contained therein, against disclosure, including disclosure of subcontractor bid documentation to the Contractor and other subcontractors to the fullest extent permitted by law. However, in the event of arbitration or litigation, the bid documentation shall be subject to discovery, and the Department assumes no responsibility for safeguarding the bid documentation unless the Contractor has obtained an appropriate protective order issued by the arbitrator or the court.

Full compensation for preparing the bid documentation, submitting it for escrow, and presenting it upon request of the Engineer or a Disputes Review Board shall be considered as included in the contract prices paid for the various items of work, and no additional compensation will be allowed therefor.

The direct cost of depositing the bid documentation in escrow at the agreed commercial business will be paid by the State.

5-1.09 SUPPLEMENTAL PROJECT INFORMATION

The Department makes the following supplemental project information available:

Supplemental Project Information

Means	Description
Included in the Information Handout	<ol style="list-style-type: none"> 1. Foundation Recommendations for Sacramento River Bridge (Antler), Bridge No. 06-0210, dated July 31, 2008 2. Supplemental to Foundation Report for Sacramento River Bridge (Antler), Bridge No. 06-0210, dated July 31, 2008 3. Revised Lateral Resistance, py Curves, Bridge Number 06-0210, dated July 31, 2008 4. Sacramento River Bridge (Antler), Bridge No. 06-0210, Project Specific Design Criteria 5. U.S. Army Corps of Engineers, 404 Individual Permit 6. CA Regional Water Quality Control Board 401 Permit 7. CA Department of Fish and Game, Streambed Alteration Agreement 1602 Permit 8. Permanent Erosion Control – Soil Restoration and Revegetation Report 9. Optional Stockpile Sites 10. Water Drafting Specifications (National Marine Fish Service, Southwest Region, August 2001) 11. Addendum Juvenile Fish Screen Criteria for Pump Intakes (National Marine Fisheries Service, Environmental & Technical Services Division, Portland, Oregon, May 9, 1996) 12. Sacramento River Bridge (Antler), Bridge No. 06-0210, Bass Motif Graphics Package 13. Cal-OSHA Mining and Tunnel Unit Classification 14. Geotechnical Design Report 15. US Department of Agriculture Forest Service Special Use Permit 16. Bureau of Reclamation Water Level Data 17. Optional Drill Tailings Disposal Site Locations 18. Sand-Blast Waste Site Investigation Report (without attachments) 19. Asbestos and Lead-Containing Paint Survey Report (without attachments) 20. Pile Driveability Analysis 21. Existing Topographic Information 22. Water Pollutant Screening Laboratory Results 23. Lab results for the unconfined compressive strength test done at Antlers B-12 24. Agreement to Amend Lake or Streambed Alteration Agreement No. R1-08-0093

Means	Description
Available for inspection at the Transportation Laboratory	1. Rock Cores
Available for inspection at North Region Construction Office, 703 B Street, Marysville CA, 959015	<ol style="list-style-type: none"> 1. Cross Sections 2. U.S. Army Corps of Engineers, 404 Individual Permit 3. CA Regional Water Quality Control Board 401 Permit 4. CA Department of Fish and Game, Streambed Alteration Agreement 1602 Permit 5. Permanent Erosion Control – Soil Restoration and Revegetation Report 6. Optional Stockpile Sites 7. Water Drafting Specifications (National Marine Fish Service, Southwest Region, August 2001) 8. Addendum Juvenile Fish Screen Criteria for Pump Intakes (National Marine Fisheries Service, Environmental & Technical Services Division, Portland, Oregon, May 9, 1996) 9. Cal-OSHA Mining and Tunnel Unit Classification 10. Geotechnical Design Report 11. US Department of Agriculture Forest Service Special Use Permit 12. Bureau of Reclamation Water Level Data 13. Optional Drill Tailings Disposal Site Locations 14. Sand-Blast Waste Site Investigation Report (with attachments) 15. Asbestos and Lead-Containing Paint Survey Report (with attachments)
Plans of the existing bridge may be requested by fax from the District 2 Project Records Unit, fax (530) 225-3324.	Bridge as-built drawings

8-1.06 SELF-CONSOLIDATING CONCRETE

GENERAL

Summary

This section includes specifications for self-consolidating concrete (SCC). You may use SCC for column and pier table locations at the Sacramento River (Antlers) Bridge.

Definitions

Self-consolidating concrete: Flowing concrete capable of spreading without segregation to a level state without the use of internal or external vibrators.

Submittals

Submit the following to the Engineer for approval before placing SCC:

1. SCC mix design and placement procedures
2. Trial batch test report
3. Details and placement procedures for the mock-up
4. Test samples and test results from the mock-up

Quality Control and Assurance

General

Prepare SCC specimens for compressive strength testing under California Test 540 except fabricate test specimens as follows:

- a. Place test molds on a firm, flat surface to prevent distortion of the bottom surface. When more than one specimen is to be made from the same batch, make all specimens simultaneously. Fill the mold in 1 lift, pouring the concrete from a larger container. Pat sides of the mold lightly by hand, or jig by rocking the mold from side to side.
- b. Strike off the surface of the concrete even with the top edge of the mold. Wipe the sides of the mold free of excess concrete and press the lid on.

Prequalification of SCC Mix Design

Prequalify the SCC mix design with a trial batch using the same materials, mix proportions, mixing equipment, procedures, and size of batch to be used in the production of SCC. The trial batch test report for the SCC mix design must include the following tests and results:

SCC Mix Design Requirements		
PROPERTY	REQUIREMENT	TEST METHOD
Slump Flow	At least 500 mm	ASTM C 1611
Flow Rate - T ₅₀	Between 2 and 7 seconds	ASTM C 1611
Visual Stability Index	1.0 or less	ASTM C 1611
J-Ring Flow	The difference between J-Ring flow and the slump flow must not exceed 50 mm	ASTM C 1621
Column Segregation	Static segregation must not exceed 15%	ASTM C 1610
Bleeding	Bleeding capacity must not exceed 2.5%	ASTM C 232
Compressive Strength	The average of 5 test cylinders must be at least 4 MPa greater than the specified strength.*	California Test 521
Minimum Compressive Strength	The minimum for an individual test cylinder must not be less than the specified strength.*	California Test 521
* At the maximum age specified or allowed		

Establish a slump flow for the SCC mix design. Include the established slump flow in the trial batch test report.

Mock-up

Construct a mock-up before placing SCC to demonstrate that the SCC will flow for the distance required by the proposed construction procedure, completely fill the forms, and encapsulate the rebar and embedments. Prequalify SCC mix design before constructing the mock-up.

The mock-up forms must be similar to those used for the production elements. Include in the mock-up, concrete, reinforcement and all concrete embedments as shown in the plans and approved working drawings, except that all reinforcement and embedments must stop 300 mm from both longitudinal ends of the mock-up. The mock-up must simulate the flow of concrete for the maximum distance anticipated during actual production, or a minimum of 3 meters if the anticipated flow travel is less than 3 meters. The Engineer must be present during the placement of the SCC in the mock-up.

Take a sample of at least 45.4 kg of concrete from within the forms at the point of discharge and at the point farthest from the point of discharge. Determine the coarse aggregate content of each sample under California Test 529. The coarse aggregate contents of the samples must not differ from each other by more than 128 kilograms per cubic meter.

Saw-cut the mock-up full-depth in the transverse direction approximately two feet from the termination of the pour. Voids or honeycombing in the SCC or between the concrete and embedded elements are not acceptable.

If the Engineer determines that the SCC is not acceptable as specified above, additional mock-ups must be constructed at your expense.

Dispose of the mock-up under Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications.

Field Quality Control

Determine the fine aggregate moisture content for each batch of SCC.

Determine slump flow and VSI at the beginning of SCC placement and whenever a set of concrete cylinders is prepared. The slump flow must not vary by more than three inches from the established slump flow, and the minimum allowable slump flow is 500 mm. Visual stability index must be 1.0 or less. If the slump flow and VSI do not meet these requirements, you must make corrective changes in the SCC mix design or placement procedures before placing additional SCC. Submit revised SCC mix design or placement procedures to the Engineer for approval.

MATERIALS

SCC must comply with Section 90, "Portland Cement Concrete," of the Standard Specifications. You may use any of the maximum combined aggregate grading limits specified in Section 9-30.04, "Combined Aggregate Gradings," of the Standard Specifications. You may use a viscosity modifying admixture conforming to ASTM C 494 Type S. The maximum limits on supplementary cementitious materials of Section 90-2.01C, "Required Use of Supplementary cementitious Materials," of the Standard Specifications, do not apply.

PAYMENT

The Department measures and pays for SCC under the specifications requiring or allowing its use.

10-3.15 HIGHWAY ADVISORY RADIO SYSTEM

Highway advisory radio (HAR) system equipment shall be furnished and installed in conformance with the details on the plans, HAR manufacturer or supplier recommendations, and as directed by the Engineer. The Contractor shall be responsible for furnishing a fully tested and operational system.

The highway advisory radio system shall consist of AM broadcast band radio equipment for a fixed location and shall include one AM transmitter, coupler, automatic antenna tuner audio processor, telephone line interface, solid-state recorder/player, antenna, pole, tuner, cabinets and enclosures, grounding system, transient lightning suppression, battery back-up/charging systems, external digital recorder/player microphone (or broadcast quality headset with noise canceling microphone), control speaker phone, and other equipment required to provide a complete system.

The Contractor shall provide the Engineer with a Certificate of Compliance from the manufacturer/supplier 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 HAR system conforms with the contract plans and specifications, conforms to the prequalified design and material requirements, and was manufactured in conformance with the approved quality control program.

The outside of each equipment packing container shall be marked with the Caltrans contract number and the make, model number, serial number and installed operating frequencies of the unit within. Test methods followed by the State for evaluation of supplied equipment will follow EIA recommendations where applicable.

Prototype equipment will not be acceptable. Only equipment previously marketed and sold for at least 6 months prior to the advertising date will be acceptable.

Any semiconductor devices or components utilized in the radio equipment which are not available from a minimum of 2 manufacturers shall have 5 such devices or components provided for each device utilized in the radio equipment.

All manuals, warranty forms, and license forms shall be submitted with the unit for acceptance.

All equipment shall be warranted against defects and any failures which may occur through normal use for one year from the date the equipment is placed in service.

Proper contact protection shall be placed at all high voltage connections to prevent accidental contact with operators and operator's tools and equipment.

The HAR system may consist of equipment from multiple manufacturers but shall be integrated to be fully functional.

The HAR system shall be designed to operate in conformance with CFR Title 47, Section 90.242 of the FCC rules and regulations.

Unless otherwise specified or shown on the plans, all radio, electrical, and mechanical equipment shall be mounted inside a Caltrans standard Model 332/334 controller cabinet enclosure as described in Section 86-3.03, "Model 170 and Model 2070 Controller Assemblies," of the Standard Specifications. Card rack mountable equipment shall be provided with slotted mounting holes and shall be compatible with an EIA-310B rack.

The equipment shall be designed in such a way to be easily accessible for maintenance. HAR equipment shall be installed at the locations shown on the plans. The Contractor shall terminate the power conductors on the TBS terminal of the controller cabinet enclosure. Initial turn on shall be performed by the manufacturer's representative.

TRANSMITTERS

The transmitters shall be the type certified and accepted by the FCC for travelers information stations (TIS) service, and shall operate in a range from 530 kHz to 1700 kHz.

Each transmitter shall have the capability of remote and local control. The ability to broadcast live messages from the transmitter site and the ability to record and broadcast from the Transportation Management Center (TMC) shall be provided.

Adjustment of RF power output shall be made by using an easily accessible control and shall be continuously adjustable over the transmitter output power range specified herein.

Built-in, switchable meters shall indicate relative percentage of modulation and forward/reflected RF output power levels.

A provision for automatic station identification using stored, digitized audio shall be provided every 30 minutes while transmitting.

Operating temperature range shall be from -30°C to 60°C. Operating humidity range shall be from 20 percent relative at 30°C to 95 percent relative at 50°C.

The HAR shall deliver a 2 millivolt/meter signal, at a distance of 1.5 km from the station with a maximum transmitter output of 10 watts.

The transmitter shall withstand an overload mismatched output (including an open or short circuit) for a period of 5 minutes at 10 watts output without overheating or component failure. The transmitter shall automatically resume normal operation when the mismatched output load is removed.

The transmitter RF power output level shall be rated at 30 watts, maximum. The transmitter output level shall be adjusted from a minimum of 2 watts to no more than 10 watts. A warning label shall be securely attached to the transmitter next to the adjustment output control and shall read as follows, "DO NOT EXCEED 10 WATTS."

Transmitter	
RF power output	Adjustable to 10 watts
Type of emission	Amplitude modulation (A3)
Frequency range	500 kHz to 1.7 MHz
Frequency tolerance	+/- 100 Hz, maximum
Carrier level shift	2% maximum
Harmonic attenuation	53 dB or better
Noise	-70 dB below 80% modulation
Audio input	600 Ω balanced
(for 100% modulation)	-20 dBm minimum
Frequency response	20 Hz to 15 kHz \pm 1.0 dB maximum
Audio distortion	Less than 1.5% @ 99% modulation
Modulation monitoring	100% peak flasher Built-in envelope detector
Modulation limiting	Built-in 100% peak modulation limiter 20 dB gain reduction: defeatable
Power consumption	150 watts at 115 V(ac)

Transmitter Station

The transmitter station shall include the amplitude modulation (AM) transmitter and antenna system, digital recorder system, lightning protection, controls, dual tone multi-frequency (DTMF) telephone handset, back-up system, conduit, wiring and other hardware required for proper operation. The transmitter station shall be housed in a Model 332/334 cabinet enclosure.

The operating frequency of the transmitter shall be 1610 kHz.

Power/Voltage Standing Wave Ratio (Vswr) Meter

A method of measuring RF power (forward and reverse) as well as VSWR shall be included with the transmitter. It may be either integrated in the transmitter or provided as a separate unit. The power/VSWR meter shall have the following features and requirements:

1. Meter (either analog or discrete LED display/bar graph)
 1. Displays forward RF power, reflected RF power and SWR.
 2. Scale shall be appropriate for the typical power levels to be measured.
 3. VSWR shall display in a logarithmic function from 1.0 to ∞ .
 4. LED displays shall have a minimum of 20 levels of indication.
2. Function Switch: Selects measurement function between RF power and SWR.
3. Power Direction Switch: Selects RF power measurement between forward RF power and reflected RF power.
4. Meter Zero Adjustment Screw (analog meters only): Adjusts the meter indicator to zero position with regular screwdriver if the indicator is far from zero position when the unit is not in use.
5. Transceiver: RF power input from radio equipment which is to be connected by 50- Ω coaxial cable with UHF connector.
6. Antenna: RF power output to an antenna or a dummy load which is to be connected by 50- Ω coaxial cable with UHF connector.

13.8 VDC.--DC power source for meter illumination and LED display. Acceptable DC voltage range is from 11 VDC to 15 VDC. Connect red line for positive and black line for negative polarities. This power source is not essential for measuring purpose.

Coupler Unit/Automatic Antenna Tuner

The coupling unit/automatic antenna tuner shall:

1. Isolate the transmitter from high voltage through the use of high-pass capacitors and fuses.
2. Compensate for antenna system impedance mismatch through the use of multi-tap toroidal transformers.
3. Compensate for antenna stray reactance through the use of a decade system of capacitor combinations.
4. Include an internal VSWR meter and include controls for correcting load impedance and reactance.

HAR POWER AND BACK-UP EQUIPMENT

Equipment necessary for operation and backup of the HAR shall be included as part of the system and shall conform to the following.

Primary Power Input Provisions

Operation shall be from 117 ±10 percent V(ac), 60 ±3 Hz single phase, at a power input not to exceed 100 watts, continuous.

The primary input power shall be controlled by a circuit breaker mounted on the front panel labeled "AC POWER."

An AC power light indicator shall be provided on the front panel.

Interface Unit

The highway advisory radio system shall be supplied with an interface unit containing all system power control including chargers, isolation relays, metering, switches, fuse indicators and audio/power arrestors. The interface unit shall plug into 120 V(ac) power in the cabinet via a standard 120 V(ac) cord and plug. Barrier strips provide for telephone line input and output, battery charge/discharge and 12 V(dc) power distribution to components.

Main Power Back-up

In the event of AC power loss, the HAR system shall automatically switch to a battery back-up system and continue to operate without degradation of performance for a period of not less than 12 hours.

The battery back-up system shall utilize a battery charger and gel cell batteries. The battery back-up system shall maintain the batteries without overcharging. The batteries shall not emit any corrosive, toxic or explosive gasses.

The HAR system shall resume normal operation after AC power has been restored.

Indicator lights shall be provided to show when the unit is operating on AC power, or when it is operating on battery back-up. A voltmeter shall show the condition of the battery back-up system.

A front panel switch labeled "DC POWER" shall activate DC operation for the HAR system.

Fuse protection shall be provided on the battery charger and on the front panel for DC load.

The battery charger shall be designed for floating service and have an adjustable output voltage. The battery charger shall be the complete shut off type (fully automatic) and shall bring completely discharged batteries to a fully charged condition within 12 hours. The battery charger shall be designed to operate in unventilated area.

When the HAR is operating on battery back-up, the system shall automatically disconnect the HAR, to protect the batteries from damage caused by too deep a discharge. The disconnect threshold shall be adjustable over the range of either 20.0 to 24.0 VDC for a 24 volt system or 10 to 12 VDC for a 12 volt system.

The batteries shall not discharge to less than 10 volts DC for a 12-volt system, or 20 volts DC for a 24-volt system, when supplying 4.0 amperes for a period of 30 hours at 30°C. The battery shall be installed in the state furnished battery tray.

The batteries shall be easily accessible and not impede work on other equipment. The batteries shall be removable from the cabinet for service or replacement using connectors that do not require the use of hand tools. If 2 connectors are identical, and used for different purposes, they shall be clearly marked or polarized differently to ensure proper installation after repair or replacement of component parts. When the battery back-up system is disconnected from the cabinet, the station shall be capable of continued operation solely on AC power without having to connect, jump, or bypass any other device. Only relay, contact, and switch type devices shall be used to make a clean procedure of removal.

HAR OPERATION CONTROL EQUIPMENT

Equipment necessary for local and remote control of the HAR operations shall be included as part of the system and shall comply with the following.

Local Control Facilities

Local operator control of all essential features of the highway advisory radio station shall be accomplished either by the use of a standard dual tone multi-frequency (DTMF) telephone or by necessary discrete front panel controls.

Remote Control Facilities

A telephone line interface shall be provided so that the HAR may be connected to and controlled through a voice-grade dial-up telephone line with appropriate interface. The telephone line interface shall have a standard RJ 11 connector.

The HAR shall be equipped with a telephone line interface so that it will be possible to access, monitor and control the message being transmitted. The audio for the monitor function shall be obtained by demodulating the transmitter audio.

HAR MESSAGE STORAGE AND MANAGEMENT EQUIPMENT

Equipment necessary for storage and management of messages shall be included as part of the HAR and shall comply with the following.

Message Management

The HAR shall be able to receive a live or recorded message from a remote location via the telephone line or from the operator at the station location. This feature shall not require the use of hand tools.

The message shall be stored in a solid-state recorder/player, with the ability for selecting and checking the message prior to transmission.

Solid-state Recorder/Player

Non-volatile solid-state memory shall be used for message storage. Magnetic media will not be acceptable.

A DTMF decoder shall be provided for programming and control of the recorder using a standard DTMF telephone. This function shall be possible, both remotely, via the telephone line interface, and at the station location. The DTMF tones shall not be recorded on the message.

Memory storage capacity shall be provided for a minimum of 250 different messages, with a minimum of 860 seconds total recording time. The length of each message shall be continuously variable up to the total recording time available.

The recorder shall have the flexibility for messages to be organized into a minimum of 20 different play lists with a minimum total of 100 different messages contained within the 20 play lists.

An internal clock shall be provided to select and control message play-back by day, hour and minute.

The system shall allow the recording of a message while another message is being broadcast.

Recording features shall include:

1. Monitor off-air RF output of transmitter
2. Recording message
3. Playback of recorded message
4. Erasing of message
5. Set time spacing between messages
6. Set play list sequence
7. Hear play list sequence

8. Set recording source input (dynamic microphone, cassette player (auxiliary audio input), and control telephone)
9. Set recording speed
10. Set background source materials message.
11. Set alternate audio source
12. Set clock time and day of the week (clock time shall be in military time and day of week shall be from 1 to 7, where 1 is Sunday)
13. Set message schedules
14. Hear message schedules
15. Cancel message schedules
16. Set play list number
17. Hear play list number
18. Cancel play list number
19. Stop record
20. Set remote record security code

The days of the week shall be numbered consecutively from 1 to 7 beginning with Sunday.

The functions of recording and editing shall be accessible remotely or locally.

The recorder shall be able to be configured in the message repeater mode using DTMF tones.

Frequency response shall be from 200 to 10,000 Hz. The recorder/player shall provide voice prompts in response to operator input.

Command List in Numerical Order

The solid state recorder/player shall have the following functions:

To hear the command list in numerical order, enter [*0#] and the system will respond with:

To hear the command list in functional order, enter	*0#
To record a message, enter	*1#
To listen to a message, enter	*2#
To erase a message, enter	*3#
To set message spacing, enter	*4#
To create the broadcast list, enter	*5#
To report the broadcast list, enter	*6#
To set input source, enter	*7#
To go on the air live, enter	*8#
To play weather radio during message spacing, enter	*9#
To control the weather alert function, enter	*10#
To optimize message space, enter	*11#
To set the calendar, enter	*12#
To set the clock, enter	*21#
To create day-of-the-week scheduled events, enter	*22#
To report day-of-the-week scheduled events, enter	*23#
To clear day-of-the-week scheduled events, enter	*24#
To create month-date-year scheduled events, enter	*32#
To report month-date-year scheduled events, enter	*33#
To clear month-date-year scheduled events, enter	*34#

To create a message list, enter	*41#
To report a message list, enter	*42#
To make a message list the current broadcast list, enter	*43#
To clear a message list, enter	*44#
To terminate the session and hang up, enter	*51#
To record for a specified time, enter	*61#
To control the transmitter, enter	*62#
To set the security code, enter	*71#
To create periodic date announcements, enter	*81#
To create periodic time announcements, enter	*82#
To create periodic scheduled events, enter	*92#
To report periodic scheduled events, enter	*93#
To clear periodic scheduled events, enter	*94#
To record and broadcast an emergency message, enter	*911#
or, to reset the system, enter	*127#
To return to the main menu, press	#

At the end of the list, the system will wait in silence for a command to be entered before proceeding.

Memory Power and Back-up

The recorder shall operate on 12 VDC \pm 5 percent at a total power consumption not to exceed 10 watts from the source. The recorder memory back-up shall operate on 12 VDC.

In the event of AC power loss to the digital recorder, the memory power back-up shall automatically maintain messages in the memory for up to two weeks.

ANTENNA

The antenna shall be designed to be mounted on a 533 mm square by 1219 mm high, one-piece galvanized steel tower with a hinged bottom plate that allows the tower to tilt down to a 90 degree angle. The length of the antenna shall be 13.4 m. The top of the antenna shall extend 15 m above ground level.

The antenna shall be filament wound epoxy glass with an epoxy polyamide paint finish. Top loading shall consist of an 813 mm sphere.

The antenna shall be the weather resistant type and shall operate within a temperature range of -40°C to 65°C. It shall withstand wind velocities of 160 km per hour without any discernible damage while remaining functional.

The maximum weight of the complete antenna excluding tower shall not exceed 136 kg.

HAR TRANSIENT AND LIGHTNING PROTECTION

The transient/lightning (T/L) protection shall be provided for the power line, telephone line, and antenna system. The (T/L) protection for the power line shall provide as a minimum protection the following:

Number of AC outlets (minimum):	5
Turn-on voltage:	200 volts
Energy rating (minimum): IEEE 8/20 waveform	700 joules
Peak current (minimum):	20,000 amperes
Stand-by current (maximum), for 60 Hz:	1 mA

The (T/L) protection for the telephone line shall provide as a minimum protection the following:

Clamping voltage:	200 volts $\pm 10\%$
Energy rating (minimum):	400 joules
Series resistance (max.):	30 ohms
Response time (maximum):	1 nanosecond

The (T/L) (lightning arrester) protection for the antenna system shall provide as a minimum protection the following:

Clamping voltage:	90 volts $\pm 10\%$
RF power (minimum):	35 watts
Frequency range:	500 kHz to 2 MHz
VSWR (maximum):	1.2 to 1
Insertion loss (maximum):	0.2 dB
Surge current (minimum): IEEE 8/20 waveform	17,000 amperes
Response time (maximum):	5 nanosecond

LIGHTNING ARRESTOR ENCLOSURE

The lightning arrester shall be mounted in a NEMA Type 3R enclosure with hinged cover, as shown on the plans and shall have provisions for padlocking. An aluminum plate shall be installed vertically, facing the door in the enclosure. The Contractor shall terminate the ground conductor with an aluminum-copper NEMA one and/or three bolt hold tongue. The tuner, coupler, and lightning arrester shall be mounted on the aluminum plate.

ANTENNA COAXIAL CABLE (ACC)

The ACC shall consist of an RG-8/U single foil single braid flexible coaxial cable with a solid bare copper center conductor, cellular polyethylene dielectric, 97 percent tinned copper braid, and 100 percent shield coverage and shall conform to the following requirements:

Electrical Characteristics	
Capacitance	26 pF/ft (nominal)
Impedance	50 ohms (nominal)
Velocity of propagation	78% (nominal)
DC loop resistance	1.2 ohms per 300 m (nominal) @ 20°C.

Attenuation at 20° C.	
Frequency (MHz)	Nominal dB/30 m
10.0	0.50
50.0	1.2
100.0	1.6
200.0	2.4

Physical Dimensions	
	Nominal O.D. (mm)
Center conductor	3 mm
Dielectric	7 mm
Outer jacket	10 mm

ANTENNA FEEDING CABLE (AFC)

The AFC shall consist of a No. 12 AWG solid copper conductor. The AFC shall have a length necessary to connect the lightning arrestor and the antenna without causing stress to the cable and shall be terminated with a UHF plug and a reducing adapter as specified elsewhere in these special provisions.

After installing the AFC between the arrestor enclosure and the antenna, the Contractor shall seal the antenna connection at the base of the antenna.

COAXIAL CABLE CONNECTORS (FOR TYPE ACC AND AFC)

Coaxial cable connectors for attaching Type ACC and AFC including the reducing adapter shall be UHF Standard and meet the following requirements:

Electrical Characteristics	
Impedance:	50 ohms (nominal)
Frequency range:	0 - 300 MHz
Voltage rating:	500 volts peak

Mechanical	
Mating:	Standard size: 5/8- 24 threaded coupling. Push-on mates with any standard size threaded receptacle
Method of attachment:	Clamp and Crimp.
Composition:	Bodies- Brass or die cast zinc Contacts- brass, silver plated Insulators- TFC, copolymer of styrene, polystyrene, mica-filled phenolic and/or, PBT polyester or equal Plating- ASTRO plate and silver Other metal parts- Brass

Environmental	
Temperature	-55°C to +165°C
Moisture	Weather resistant design

GROUND SYSTEM

The ground system shall be a Triad ground system. This system consists of three 6.1 meter long, 51 millimeter diameter copper ground pipes placed in an equilateral triangular pattern centered on the base of the antenna. Each pipe shall be placed 1.5 meters from the center of the base of the antenna. Each pipe shall be placed in a 152 millimeter diameter hole drilled deep enough to place the top of each pipe 152 millimeters below grade. Backfill shall be placed around each pipe after placement. The center of each pipe shall be filled with a water/sand/copper sulfate mixture as recommended by the manufacturer. The top of each pipe shall be protected by a 203 millimeter circular pull box set flush with the finish grade. An open grate cover shall be installed in the pull box.

The pipes shall have 6 millimeter weep holes drilled in a regular pattern the entire length of the pipes. The pipes may be constructed of two, 3.05 meter long copper pipes joined by a coupling that has been silver soldered to both pipes.

Each pipe shall be connected to the antenna ground connection by a single #8 bare copper wire protected by 25 millimeter rigid conduit. The wire shall be passed through 2 holes in the top of the pipe and wrapped 3 times around the pipe diameter. The wire shall be securely silver soldered to the outer surface of the pipe around the entire diameter. Each wire shall be securely bonded to the antenna ground connection using appropriate hardware.

SERVICE MANUALS

The Contractor shall provide 3 service manuals which will contain the following described sections.

Introduction

Each manual shall contain a general information section which shall include the following items:

1. A list of applicable sub-assemblies that comprise the specified equipment.
2. Overall description of the equipment design features, performance, and applications.
3. Equipment specifications summary.
4. Equipment installation instructions, if applicable.

Theory of Operation Section

Each manual shall contain equipment theory of operation section which shall include the following items:

1. Theory of operation of the standard equipment, with unique or unusual circuitry described in detail.
2. Theory of operation reflecting any modifications to the standard equipment.

Maintenance Section

Each manual shall contain an equipment maintenance section which shall include the following items:

1. Recommended test equipment and fixtures, or minimum operational and performance requirements for appropriate test equipment.
2. Troubleshooting information and charts.
3. Removal and installation procedures for replacing assemblies and subassemblies, if not obvious or if improper sequencing of steps may result in component damage.

Replacement Parts Section

Each manual shall contain an equipment replacement parts section which shall include a component parts list including electrical parts, mechanical parts, and assemblies. All semiconductors shall be identified by the supplier's numbers and, as applicable, by JEDEC numbers.

Diagram Section

Each manual shall contain an equipment diagram section which shall include the following items:

1. Schematic diagram identifying all circuit components and showing normal test voltages and levels.
2. An overall functional block diagram.
3. Detailed interconnecting diagram showing wiring between modules, circuit boards, and major components.
4. Pictorial circuit board layout diagram showing both component placement and printed wiring detail.
5. Diagram showing location of circuit boards and other subassemblies.
6. Exploded view diagram of complex mechanical assemblies.

Physical Requirements

Each manual shall conform to the following physical requirements:

1. All pages, including latest revisions, shall be securely fastened together between protective covers (loose-leaf ring binding is acceptable).
2. No page shall be subject to fading from exposure to any normal source of ambient lighting (ozalid reproduced pages are not acceptable).
3. The cover or first page shall be marked in any manner to show the Caltrans Contract number and advertising and bid opening dates.

SYSTEM TESTING

Ground System Testing.

The Contractor shall take certified measurements after the installation of the ground system. The measurements shall be certified by a person holding one of the following qualifications:

1. Federal Communications Commission General Radiotelephone License.
2. iNARTE Telecommunication Certification at the Master Technician level or above.
3. NICET Industrial Instrumentation Certification as a Level IV Technician.

The testing shall utilize an earth resistance meter and be conducted in accordance with IEEE Standard 3-point fall of potential method.

The Contractor shall provide all test equipment, measure and document ground resistance values on the grounding system specified elsewhere in these special provisions.

The resistance meter probes shall be placed and connected as follows:

1. Ground (green) lead connected to ground system bonding connector at base of the antenna.
2. Remote current probe (red) lead to a test spike placed 10 meters from the base of the antenna. The probe shall be placed on a line that begins at the antenna base and passes between any 2 of the Triad ground system rods, an equal distance from each of the rods.
3. Voltage probe (yellow) lead to a test spike placed at a point midway between the antenna base and the current probe, on the line between the antenna base and the current probe (red lead).

Measurement data shall include the following:

1. Date and time of the measurement.
2. Weather conditions (temperature, relative humidity, precipitation).
3. Azimuth direction in degrees (to the nearest 5 degrees) of the line used to place the measurement probes.
4. Resistance measurement, including uncertainty.
5. Test instrument model, serial number, date of last calibration.
6. This measurement shall be completed three times, once for each of the radial lines used to place the measurement probes.

Data shall be recorded in the following format:

Measurement No.	Date	Time (24h)	Weather Conditions			Azimuth direction (degrees)	Measured Resistance (Ohms)	Measurement Uncertainty (% or absolute)
			Temp F	RH %	Precip			
1								
2								
3								

The measured resistance shall be less than 30 ohms for all three measurements.

Equipment information:

Manufacturer _____

Model _____

S/N _____

Date of last calibration _____

Measurements certified by: _____

Qualification _____

Four copies of the measurement data shall be delivered to the Engineer for approval.

Cable Testing.-The antenna coaxial cable (ACC) will be tested by the Contractor. Those cables found to have faults shall be replaced. The testing shall utilize a time domain reflectometer. A fault in a length of cable is defined as any of the following:

1. A return loss measurement indicating that there is a short in the cable.
2. A return loss measurement indicating a cut or open circuit in the cable.
3. A visual inspection which reveals exposure or damage to the cable shielding.

HAR Testing. After all HAR equipment has been installed, the Contractor shall test the HAR. All testing shall be certified by a person holding a Federal Communications Commission General Radiotelephone Operator license (GROL).

Minimum test equipment required for testing the HAR shall consist of:

1. Dummy load, 50 Ohms.
2. Power meter.
3. Communications monitor.
4. Field strength meter.
5. Audio generator with 600-ohm impedance output.
6. Modulation analyzer.
7. GPS location system.

The Contractor shall adjust the HAR antenna system by initiating an auto-tune operation on the automatic antenna tuner. The antenna system shall be considered tuned when the system voltage standing-wave ratio (VSWR) is less than 1.5:1 as indicated both on the automatic antenna tuner display and the transmitter internal VSWR indicator (if so equipped) or external power meter.

For the following tests, the antenna system and antenna tuner shall be disconnected and the 50- ohm dummy load connected to the transmitter output port along with any other necessary test equipment.

The transmitter shall be adjusted to achieve an output power of 10 wattsA +0 dBm level, 1 kHz tone shall be applied to the system line input. One minute of the tone shall be recorded. The tone shall be played back into the transmitter in message loop mode. Any transmitter audio limiting circuits shall be switched off. The transmitter shall be adjusted to achieve 95 percent modulation as indicated by the transmitter metering. With the transmitter operating as noted, measurement of the following transmitter parameters shall be made and recorded, including the uncertainty for each measurement expressed as an absolute value or percent of measurement:

1. Power output in watts.
2. Transmitter RF harmonic level (all measurable harmonics, record harmonic frequency and level in dBc)
3. Modulation level as a percentage of carrier level as measured by an external modulation analyzer.
4. Audio distortion in percent.

Reduce the modulation to a level of 80 percent and measure the transmitter audio noise in dB, referenced to the 1 kHz tone amplitude.

The measured data shall be recorded in the following format:

Date and time	Power output (W)	Unc.	Modulation level (%)	Unc.	Audio distortion (%)	Unc.	Harmonic level (freq & level, dBc)	Unc.

Equipment used for the preceding measurements shall be documented in the following format:

Equipment	Model	Serial number	Date of calibration

The Contractor shall remove the dummy load and connect the antenna system to the transmitter. A test message shall be recorded and transmitted. Modulation shall be adjusted to achieve 85 percent to 95 percent modulation as indicated on the transmitter internal metering. If so equipped, the transmitter modulation limiting circuit should be active.

While transmitting the test message, field strength measurements shall be taken at two locations:

1. At a point located along Interstate Highway 5 a distance of 1.5 km north of the HAR antenna location (as measured by the GPS system).
2. At a point located along Interstate Highway 5 a distance of 1.5 km south of the HAR antenna location (as measured by the GPS system).

Transmitter output power shall be adjusted to achieve a measured field strength of 2.0 V/m at the location with the greatest measured field strength. The transmitter output power shall be measured after completing this adjustment and shall not be greater than 10.0 watts.

Field strength measurements shall be made and recorded at locations along Interstate Highway 5 for each of the distances shown in the table below as measured from the base of the HAR antenna in the direction noted. Each location shall be documented by the GPS determined coordinates including Estimated Position Error (EPE). For any location where the field strength is determined to be below a measurable level, enter "0.0."

All locations documented by the GPS location system shall be referenced to the NAD83 datum.
 EPE for each GPS determined location shall not exceed 6.0 m.

Date & Time	Distance (North/South, km)	Field strength (V/m)	GPS coordinates		EPE
			Latitude	Longitude	
	15.0 N				
	13.0 N				
	11.0 N				
	9.0 N				
	7.0 N				
	5.0 N				
	4.0 N				
	3.0 N				
	2.6 N				
	2.2 N				
	1.8 N				
	1.5 N				
	1.0 N				
	0.6 N				
	0.2 N				
	0.2 S				
	0.6 S				
	1.0 S				
	1.5 S				
	1.8 S				
	2.2 S				
	2.6 S				
	3.0 S				
	4.0 S				
	5.0 S				
	7.0 S				
	9.0 S				
	11.0 S				
	13.0 S				
	15.0 S				

Measured transmitter power output during these measurements: _____ watts

Field strength meter information:

Model: _____

Serial number: _____

Date of last calibration: _____

GPS location system information:

Model: _____

Serial number: _____

Date of last calibration: _____

Four copies of the measured data including test equipment information shall be forwarded to the Engineer for approval.

PRICE QUOTED ARRANGEMENT

Arrangements have been made to insure that any successful bidder can obtain the HAR equipment from Quixote Transportation Technologies, Inc., 11612 Lilburn Park Road, St. Louis, MO 63146, Telephone (800) 325-7226. The price quoted by the manufacturer or supplier for the HAR, FOB Destination, Net 30 is \$41,096.25, not including sales tax.

The above price will be firm for orders placed on or before 12/31/2009, provided delivery is accepted within 90 days after the order is placed.

Item	Model No.	Quantity	Price
Hiway Max HAR System - AC			
Black Max Rack and Backplane	RCK0001-9	1	1,518.30
Aluminum Back Panel Assembly with Surge Arrestors	HAR-BACK-PANEL-AC	1	1,789.20
Power Supply Module with Battery Back-up cable	DRPSM1	1	982.80
Battery Backup System (AGM)	BAT-1001	1	1,363.00
Transmitter Module FCC Certified 10 Watts	DRTXM4	1	4,194.75
Digital Recorder-Player Module with 80 Minutes Memory	DR1500-80	1	4,667.25
Digital Communications Controller	DCC-1-W	1	4,194.75
Transmitter Control Module	TCM	1	1,002.75
Automatic Antenna Tuner, LDG Z11 Pro	Z11PRO	1	396.45
Semi-Permanent Box	SMX0005	1	159.00
Valcom 49 foot V-147-CL2-TH Whip Antenna	VALANT	1	14,593.00
Triad Ground System, 3 @ 20' Tubes	GND0004	1	2,047.50
HAR Final Installation and Commissioning Package	SVC3350	1	3,937.50
FCC Licensing Frequency Study - Fixed Location	SVC0250	1	250.00
		<i>Total</i>	\$41,096.25

BID ITEM LIST
02-378904

Item No.	Item Code	Item Description	Unit of Measure	Estimated Quantity	Unit Price	Item Total
141	700658	900 MM CORRUGATED STEEL PIPE INLET (2.01 MM THICK)	M	11		
142	703450	WELDED STEEL PIPE CASING (BRIDGE)	M	62		
143	705337	600 MM ALTERNATIVE FLARED END SECTION	EA	3		
144 (F)	706652	900 MM DEBRIS RACK CAGE (H = 1.8 M)	KG	126.4		
145	015976	ROCK SLOPE PROTECTION (75 MM, METHOD B)	M3	180		
146	015977	ROCK MASONRY ENERGY DISSIPATOR	EA	1		
147	721008	ROCK SLOPE PROTECTION (LIGHT, METHOD B)	M3	240		
148	721011	ROCK SLOPE PROTECTION (BACKING NO. 2, METHOD B)	M3	1.4		
149	729010	ROCK SLOPE PROTECTION FABRIC	M2	550		
150 (F)	750001	MISCELLANEOUS IRON AND STEEL	KG	5230		
151 (F)	750501	MISCELLANEOUS METAL (BRIDGE)	KG	68 800		
152 (F)	750505	BRIDGE DECK DRAINAGE SYSTEM	KG	1100		
153 (F)	041852	STEEL WORK PLATFORM	EA	8		
154	800423	CHAIN LINK FENCE (TYPE CL-2.4)	M	2450		
155	015978	ONE WAY DEER GATE	EA	4		
156	802841	5.5 M CHAIN LINK GATE (TYPE CL-2.1)	EA	2		
157	015979	DELINEATOR (BARRIER MOUNTED)	EA	150		
158	820108	DELINEATOR (CLASS 2)	EA	36		
159	820110	MILEPOST MARKER	EA	10		
160	820111	UNDERDRAIN MARKER	EA	24		