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**DIVISION OF ENGINEERING SERVICES**  
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February 24, 2010

04-CC,Sac-160-0.8/1.3,L0.0/L1.3  
04-1A5214

Addendum No. 2

Dear Contractor:

This addendum is being issued to the contract for CONSTRUCTION ON STATE HIGHWAY IN CONTRA COSTA AND SACRAMENTO COUNTIES IN AND NEAR ANTIOCH AT ANTIOCH BRIDGE.

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 Wednesday, March 10, 2010.

This addendum is being issued to revise the Project Plans, the Notice to Bidders and Special Provisions, the Bid book and the Information Handout.

Project Plan Sheets 29, 30, 98, 100, 102, 103, 104, 105, 107, 108, 109, 110, 111, 112, 113, 114, 116, 118, 119, 121, 123, 131, 139, 141, 142, 150, 151, 158, and 165 are revised. Copies of the revised sheets are attached for substitution for the like-numbered sheets.

Project Plan Sheet 89 is deleted.

In the Special Provisions, Section 4, 'BEGINNING OF WORK, TIME OF COMPLETION, AND LIQUIDATED DAMAGES,' the eighth paragraph is deleted.

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In the Special Provision, Section 5-1.09, "SUPPLEMENTAL PROJECT INFORMATION," the following documents are added to the table as follows:

**Supplemental Project Information**

Means	Description
Included in the Information Handout	12. Purchase Agreement for the Supply of Friction Pendulum bearings for Antioch Bridge Retrofit Project, dated November 17, 2009.
	13. U.S. Army Corp of Engineers Jurisdictional Determination - Delineation of Wetlands an Other Waters of the United States, dated October 2008.
	14. Section 404 Clean Water Act Nationwide Permit Application and Pre-Construction Notification Package, dated April 2009.
	15. National Marine Fisheries Service (NMFS) Marine Mammal Protection Act (MMPA) Incidental Harassment Authorization (IHA)

In the Special Provisions, Section 5-1.11, "SPECIES PROTECTION," is revised as attached.

In the Special Provisions, Section 5-1.13, "BIRD PROTECTION," is revised as attached.

In the Special Provisions, Section 5-1.14, "RELATIONS WITH CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD", the following paragraph is added after the third paragraph.

"The contractor must comply with requirements in the permit issued by Central Valley RWQCB which governs storm water and non-storm water discharges resulting from construction activities in the project area. The RWQCB permit is titled, "401 Water Quality Certification, Permit No. WDID#5B07CR00103"."

In the Special Provisions, Section 5-1.30, "PHOTO IDENTIFICATION SYSTEM," subsection, "C. Duplex Card Printer", items 13 and 14 are revised as follows:

- "13. Input hopper holds cards each 0.03 inch thick;
- 14. Output hopper holds cards each 0.03 inch thick;"

In the Special Provisions, Section 8-3.01, "WELDING," is revised as attached.

In the Special Provisions, Section 10-1.01, "ORDER OF WORK," the following paragraphs are added after the first paragraph:

"Temporary exclusion measures will be performed by the Department to provide species protection and bird protection, between February 01, 2010 and July 31, 2010, at the following locations:

- 1. Between Abutment No. 1 and Pier 9
- 2. Between Pier 41 and Station 236+50.00 (North of Abutment No. 71)

On July 31, 2010, the Department will begin the removal and disposal of the temporary exclusion measures at these locations. Removal work will take 10 working days to complete. The Contractor must begin work at these locations immediately."

All ground disturbing activities on Sherman Island, except at the locations mentioned above, must occur between May 1 and September 30 of 2011 in accordance with the USFWS Biological Opinion. Between Pier 22 and Pier 41, ground disturbing activities will be allowed in year 2010 if Contractor demonstrates compliance with the provisions in "Species Protection," and "Bird Protection," of these special provisions."

In the Special Provisions, Section 10-1.01, "ORDER OF WORK," the second paragraph is deleted.

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In the Special Provisions, Section 10-1.02, "WATER POLLUTION CONTROL," is revised as attached.

In the Special Provisions, Section 10-1.025, "TURBIDITY CONTROL," is added as attached.

In the Special Provisions, Section 10-1.11, "TEMPORARY CONSTRUCTION ROADWAY," is revised as attached.

In the Special Provisions, Section 10-1.15, "ESTABLISH MARINE ACCESS," is revised as attached.

In the Special Provisions, Section 10-1.17, "COOPERATION," the following paragraph is added after the first paragraph:

"Attention is directed to the removal of the temporary exclusion measures at the specified locations in "Order of Work," of these special provisions. The Department will begin to remove the temporary exclusion measures beginning July 31, 2010. It will take 10 working days to complete the removal work."

In the Special Provisions, Section 10-1.31, "EXISTING HIGHWAY FACILITIES" subsection, "RECONSTRUCT BASE SYSTEM PLATFORM," the fourth paragraph is revised as follows:

"Refabrication of removed material, furnishing and fabrication of new material, and installation of the BASE system platform shall conform to the provisions in "Steel Structures" of these special provisions, except that material shall be galvanized in conformance with the requirements in Section 75-1.05, "Galvanizing," of the Standard Specifications and shall not be painted."

In the Special Provisions, Section 10-1.41, "INSTALL SEISMIC MONITORING CASING," is revised as attached.

In the Special Provisions, Section 10-1.46, "FURNISH SEISMIC ISOLATION BEARING," is revised as attached.

In the Special Provisions, Section 10-1.47, "INSTALL SEISMIC ISOLATION BEARING" subsection, "WORKING DRAWING SUBMITTAL," the sixth paragraph is revised as follows:

"The bearing installation plan shall be compatible with the available work space at each location."

In the Special Provisions, Section 10-1.52, "CLEAN AND PAINT STRUTURAL STEEL" subsection, "GENERAL," the first paragraph is revised as follows:

"Proof of certification under the SSPC QP Certification Program must be submitted with your bid. Required certifications are SSPC QP-1 and SSPC-QP 3 (Enclosed Shop Facility) or AISC Sophisticated Paint Endorsement Quality Program (P1-Enclosed)."

In the Special Provisions, Section 10-1.52, "CLEAN AND PAINT STRUTURAL STEEL" subsection, "GENERAL," Item 5 of the second paragraph is revised as follows:

"5. Proof of each of any required certifications, SSPC-QP 1 and SSPC-QP 3 (Enclosed Shop Facility) or AISC Sophisticated Paint Endorsement Quality Program (P1-Enclosed)."

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In the Special Provisions, Section 10-1.525, "CLEAN AND PAINT SEISMIC ISOLATION BEARING," is added as attached.

In the Special Provisions, Section 10-1.59, "CONCRETE BARRIER, the following paragraph is added after the sixth paragraph:

"Full compensation for removal of HMA patch prior to final placement of concrete barrier (Type 50) shall be considered as included in the contract price paid per linear foot for concrete barrier (Type 50) and no separate payment will be made therefor."

In the Special Provisions, Section 10-3.08, "TELEPHONE SERVICE" subsection, "Installation Details," the last paragraph is revised as follows:

"Full compensation for any costs by the Contractor to obtain the permits and licenses shall be considered as included in the contract lump sum price paid for the seismic monitoring electrical system and no additional compensation will be allowed therefor."

In the Special Provisions, Section 10-3.11, "STRONG MOTION DETECTION SYSTEM," is replaced with Section 10-3.11, "SEISMIC MONITORING ELECTRICAL SYSTEM," and is attached.

In the Special Provisions, Section 10-3.12, "PAYMENT," is revised as attached.

In the Amendments to the Standard Specifications Dated May 2006, Section 2-1.12, "BID DOCUMENT COMPLETION," subsection 2-1.12A, "General," is revised as follows:

**"2-1.12A General**

Complete forms in the Bid book.

On the Subcontractor List you may either submit each subcontracted bid item number and corresponding percentage with your bid or fax this information to (916) 227-6282 within 24 hours after bid opening. If you fail to submit this information within the time specified, your bid is nonresponsive.

Except for the bid item number and the percentage of each item subcontracted, do not fax submittals."

In the Bid book, the "SUBCONTRACTOR LIST" form is revised as attached.

In the Bid book, in the "Bid Item List," Items 75, 76, and 77 are added and Items 71 and 74 are deleted as attached.

To Bid book holders:

Replace pages 6 and 7 of the "Bid Item List" in the Bid book with the attached revised pages 6 and 7 of the Bid Item List. The revised Bid Item List is to be used in the bid.

Attached are copies of documents included as part of the Information Handout as follows:

1. Section 404 Clean Water Act Nationwide Permit-Application and Preconstruction Notification Package
2. Revised USACE CWA Section 404 Permit
3. Purchase Agreement for the Supply of Friction Pendulum Bearings
4. NMFS MMPA Incidental Harassment Authorization
5. US Army COE Jurisdictional Determination- Delineation of Wetlands and Other Waters of the US

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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.

This addendum, attachments and the modified wage rates are available for the Contractors' download on the Web site:

**[http://www.dot.ca.gov/hq/esc/oe/project\\_ads\\_addenda/04/04-1A5214](http://www.dot.ca.gov/hq/esc/oe/project_ads_addenda/04/04-1A5214)**

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  
Office Engineer  
Division of Engineering Services

Attachments

## 5-1.11 SPECIES PROTECTION

### GENERAL

#### Summary

This work includes protecting regulated species or their habitat.

Attention is directed to "Bird Species," of these special provisions.

This project is within or near habitat for the following regulated species:

Giant Garter Snake (*Thamnophis gigas*)  
Western Pond Turtle (*Clemmys marmorata*)  
North Western Pond Turtle (*Actinemys marmorata marmorata*)  
Delta Smelt (*Hypomesus transpacificus*)  
Longfin Smelt (*Spirinchus thaleichthys*)  
Central Valley Steelhead (*Oncorhynchus mykiss irideus*)  
Sacramento Splittail (*Pogonichthys macrolepidotus*)  
Sacramento Perch (*Archoplites interruptus*)  
Sacramento River Winter Run Chinook Salmon (*Oncorhynchus tshawytscha*)  
Central Valley Spring Run Chinook Salmon (*Oncorhynchus tshawytscha*)  
Green Sturgeon (*Acipenser medirostris*)  
Burrowing Owl (*Athene cunicularia*)  
Barn Owl (*Tyto alba*)  
Cliff swallow (*Pterochelidon pyrrhonota*)  
Mason's Lilaeopsis (*Lilaeopsis masonii*)  
Suisun Marsh Aster (*Symphyotrichum lentum*)  
California Sea Lion (*Zalophus californianus*)  
Harbor Seal (*Phoca vitulina rishardsii*)  
All bird species protected under the Migratory Bird Treaty Act and California  
Fish and Game Code including, but not limited to:  
- Burrowing Owl (*Athene cunicularia*)  
- Barn Owl (*Tyto alba*)  
- Cliff swallow (*Pterochelidon pyrrhonota*)

### CONSTRUCTION

#### Protective Radius

Upon discovery of a regulated species, stop construction activities within a 100-foot radius of the discovery or as specified elsewhere. Immediately notify the Engineer. Do not resume activities until receiving written notification from the Engineer.

#### Biological Resource Information

Prior to their involvement in construction related activities, all Contractor personnel are required to attend a Worker Environmental Awareness Program presented by the State designated and USFWS approved personnel as specified in the USFWS Biological Opinion as described in "Supplemental Project Information" of these special provisions.

#### Protection Measures

Within the project limits, implement the following protection measures:

1. The Contractor must implement the Terms and Conditions of the project permits, licenses, agreements, and certifications (PLACs) and must comply with the laws associated with those PLACs.
2. The Contractor must cooperate with the biological monitors designated by the Department.
3. Giant garter snakes encountered during construction activities shall be allowed to move away from the construction site on their own volition.
4. Movement of heavy equipment to and from the project site shall be limited to established roadways.
5. All vehicles must observe a 20 mph speed limit within the construction site.
6. To implement bird protection.

- 6.1. The Contractor shall retain the services of qualified bird experts who have demonstrated knowledge of the bird species that nest in the project site and field experience in implementing bird protection on bridge structures who will be responsible for planning and implementing the CDFG approved bird protection plan as required by the CDFG 1602 permit.
  - 6.1.1. Submittals:
    - 6.1.1.1 Qualifications: Within 7 days after contract approval, submit each qualified bird expert's name, resume, and statement of qualifications to the Engineer. Allow 15 days for the Engineer's review. If the submittal is incomplete, the Engineer will provide comments. Within 7 days after receiving the Engineer's comments, update and re-submit qualifications data. Do not start construction activities until the qualified bird experts are authorized by the Engineer.
    - 6.1.1.2 Bird Control Plan: Within 7 days after contract approval, submit a Bird Control Plan to the Engineer. Allow 15 days for the Engineer's review. If the submittal is incomplete, the Engineer will provide comments. Within 7 days after receiving the Engineer's comments, update and submit the Bird Control Plan to the Engineer. Do not start construction until the Bird Control Plan is approved by the Engineer.
    - 6.1.1.3 Pre-Construction Survey Report: Submit a Pre-Construction Survey Report to the Engineer within 14 days before beginning construction activities.
    - 6.1.1.4 Initial Monitoring Report: Submit an Initial Monitoring Report to the Engineer within 48 hours after commencement of ground-disturbing activities that includes, at a minimum, the requirements for Monitoring Report submittals.
    - 6.1.1.5 Monitoring Report: Submit a Monitoring Report to the Engineer every 5 working days during the monitoring period.
    - 6.1.1.6 Incident Report: Submit an Incident Report to the Engineer within 24 hours of the incident.
    - 6.1.1.7 Annual Monitoring Report: Submit to the Engineer no later than January 15 during each year of construction.
    - 6.1.1.8 Final Monitoring Report: Submit to the Engineer no later than 20 days after completion of the project.
  - 6.1.2. Quality Assurance: The Bird Control Plan must be prepared and signed by a qualified bird expert approved by the Engineer who knowledgeable of the bird species that nest in the project site and address bird control measures.
  - 6.1.3. Quality Control: At minimum, the Bird Control Plan includes:
    - 6.1.3.1 List of species and nesting habitat addressed in the plan
    - 6.1.3.2 Protection and exclusion measures for bird species likely to nest in the project site
    - 6.1.3.3 Implementation plan for protection and exclusion measures including a schedule of when and where specific protection and exclusion measures will be implemented over the life of the project and for ensuring continuity of exclusion coverage concurrent with the removal of state-owned exclusions by the Bird Exclusion Contractor as described in 10-1.17, "Cooperation".
    - 6.1.3.4 Schedule for inspecting protection and exclusion measures
    - 6.1.3.5 Schedule for maintaining protection and exclusion measures
    - 6.1.3.6 Schedule for removing protection and exclusion measures
    - 6.1.3.7 Adaptive management plan for when nesting birds are encountered
    - 6.1.3.8 Formatting for the reports required in 6.1.1.3 – 6.1.1.8.
- 6.2. The Department will conduct initial nesting surveys prior to the start of construction and will conduct additional nesting surveys during construction, as required.
- 6.3. When work occurs during the nesting period, the Contractor shall remove unoccupied nests, not protected by the Bald Eagle Protection Act, from all affected structures to remain through any portion of the construction period.
- 6.4. The Contractor shall use exclusion techniques, approved by the Engineer, to prevent migratory birds from nesting on the ground, on structures, or in trees, shrubs, or other vegetation within the project limits. Exclusion techniques may include, but are not limited to:

- 6.4.1. Clearing and grubbing areas required by the contract.
- 6.4.2. Tree removal required by the contract.
- 6.4.3. Netting of structures using heavy delta knotless netting, 1/2 inch square mesh..
- 6.4.4. Mechanical removal of:
  - 6.4.4.1 Nests outside of nesting period
  - 6.4.4.2 Nests that do not have eggs or young birds present during the nesting period.
- 6.4.5. Damaged netting shall be repaired or replaced the same day the damage occurs.
- 6.4.6. If evidence of bird nesting is discovered or when a bird is injured or killed as a result of construction activity, immediately stop work within 100 feet of the nest, or as specified under "Protective Radius" in this section, and notify the Engineer. Do not resume work until the Engineer provides written notification that work may resume at that location. Further work, actions, or remediation may be prescribed by the Engineer and may include work exclusion zones, modified schedules, or other methods based on the species involved.

**MEASUREMENT AND PAYMENT**

Full compensation for Species Protection is included in the various contract items of work and no additional compensation will be allowed.

### 5-1.13 BIRD PROTECTION

The Department anticipates nesting or attempted nesting by migratory and nongame birds from February 1 to August 31. Stop all work within a 100-foot radius of the discovery except as specified in the following table:

**Radii Exceptions**

Species	Work Stoppage Radii (feet)
Raptors including but not limited to: - Barn Owl ( <i>Tyto alba</i> ) - Burrowing Owl ( <i>Athene cunicularia</i> )	250 ft
Non-raptors including but not limited to: - Cliff swallow ( <i>Pterochelidon pyrrhonota</i> )	50 ft

## 8-3.01 WELDING

### GENERAL

Unless otherwise specified, Section 8-3, "Welding," shall apply to any welding that is specified to conform to an AWS welding code.

Requirements of the AWS welding codes shall apply unless otherwise specified in the Standard Specifications, on the plans, or in these special provisions. Wherever the abbreviation AWS is used, it shall be equivalent to the abbreviations ANSI/AWS or AASHTO/AWS.

Wherever reference is made to the following AWS welding codes in the Standard Specifications, on the plans, or in these special provisions, the year of adoption for these codes shall be as listed:

AWS Code	Year of Adoption
D1.1	2008
D1.3	2008
D1.4	2005
D1.5	2008
D1.6	2007
D1.8	2009

Flux cored welding electrodes conforming to the requirements of AWS A5.20 E6XT-4 or E7XT-4 shall not be used to perform welding for this project.

Unless otherwise specified, Clause 6.1.3 of AWS D1.1, paragraph 1 of Section 7.1.2 of AWS D1.4, and Clause 6.1.1.2 of AWS D1.5, are replaced with the following:

The QC Inspector shall be the duly designated person who acts for and on behalf of the Contractor for inspection, testing, and quality related matters for all welding.

Quality Assurance (QA) is the prerogative of the Engineer. The QA Inspector is the duly designated person who acts for and on behalf of the Engineer.

The QC Inspector shall be responsible for quality control acceptance or rejection of materials and workmanship.

When the term "Inspector" is used without further qualification, it shall refer to the QC Inspector.

Inspection and approval of all joint preparations, assembly practices, joint fit-ups, welding techniques, and the performance of each welder, welding operator, and tack welder shall be documented by the QC Inspector on a daily basis for each day welding is performed. For each inspection, including fit-up, Welding Procedure Specification (WPS) verification, and final weld inspection, the QC Inspector shall confirm and document compliance with the requirements of the AWS or other specified code criteria and the requirements of these special provisions on all welded joints before welding, during welding, and after the completion of each weld.

The Engineer shall have the authority to verify the qualifications or certifications of any welder, QC Inspector, or NDT personnel to specified levels by retests or other means approved by the Engineer.

When joint weld details that are not prequalified to the details of Clause 3 of AWS D1.1 or to the details of Figure 2.4 or 2.5 of AWS D1.5 are proposed for use in the work, the joint details, their intended locations, and the proposed welding parameters and essential variables, shall be approved by the Engineer. The Contractor shall allow the Engineer 15 days to complete the review of the proposed joint detail locations.

In addition to the requirements of AWS D1.1, welding procedure qualifications for work welded in conformance with this code shall conform to the following:

When a nonstandard weld joint is to be made using a combination of WPSs, a single test may be conducted combining the WPSs to be used in production, provided the essential variables, including weld bead placement, of each process are limited to those established in Table 4.5.

Upon approval of the proposed joint detail locations and qualification of the proposed joint details, welders and welding operators using these details shall perform a qualification test plate using the WPS variables and the joint detail to be used in production. The test plate shall have the maximum thickness to be used in production and a minimum length of 18 inches. The test plate shall be mechanically and radiographically tested. Mechanical and radiographic testing and acceptance criteria shall be as specified in the applicable AWS codes.

The Engineer will witness all qualification tests for WPSs that were not previously approved by the Department.

In addition to the requirements specified in the applicable code, the period of effectiveness for a welder's or welding operator's qualification shall be a maximum of 3 years for the same weld process, welding position, and weld type. If welding will be performed without gas shielding, then qualification shall also be without gas shielding. Excluding welding of fracture critical members, a valid qualification at the beginning of work on a contract will be acceptable for the entire period of the contract, as long as the welder's or welding operator's work remains satisfactory.

The Contractor shall notify the Engineer 7 days prior to performing any procedure qualification tests. Witnessing of qualification tests by the Engineer shall not constitute approval of the intended joint locations, welding parameters, or essential variables. The Contractor shall notify the Engineer using the "Standard TL-38 Inspection Form" located at:

<http://www.dot.ca.gov/hq/esc/Translab/OSM/smbforms.htm>

Clause 6.14.6, "Personnel Qualification," of AWS D1.1, Section 7.8, "Personnel Qualification," of AWS D1.4, and Clause 6.1.3.4, "Personnel Qualification," of AWS D1.5 are replaced with the following:

Personnel performing nondestructive testing (NDT) shall be qualified and certified in conformance with the requirements of the American Society for Nondestructive Testing (ASNT) Recommended Practice No. SNT-TC-1A and the Written Practice of the NDT firm. The Written Practice of the NDT firm shall meet or exceed the guidelines of the ASNT Recommended Practice No. SNT-TC-1A. Individuals who perform NDT, review the results, and prepare the written reports shall be either:

- A. Certified NDT Level II technicians, or;
- B. Level III technicians who hold a current ASNT Level III certificate in that discipline and are authorized and certified to perform the work of Level II technicians.

Clause 6.6.5, "Nonspecified NDT Other than Visual," of AWS D1.1, Section 7.6.5 of AWS D1.4 and Clause 6.6.5 of AWS D1.5 shall not apply.

For any welding, the Engineer may direct the Contractor to perform NDT that is in addition to the visual inspection or NDT specified in the AWS or other specified welding codes, in the Standard Specifications, or in these special provisions. Except as provided for in these special provisions, additional NDT required by the Engineer, and associated repair work, will be paid for as extra work as provided in Section 4-1.03D, "Extra Work," of the Standard Specifications. Prior to release of welded material by the Engineer, if testing by NDT methods other than those originally specified discloses an attempt to defraud or reveals a gross nonconformance, all costs associated with the repair of the deficient area, including NDT of the weld and of the repair, and any delays caused by the repair, shall be at the Contractor's expense. A gross nonconformance is defined as the sum of planar type rejectable indications in more than 20 percent of the tested length.

When less than 100 percent of NDT is specified for any weld, it is expected that the entire length of weld meet the specified acceptance-rejection criteria. Should any welding deficiencies be discovered by additional NDT directed or performed by the Engineer that utilizes the same NDT method as that originally specified, all costs associated with the repair of the deficient area, including NDT of the weld and of the weld repair, and any delays caused by the repair, shall be at the Contractor's expense.

Repair work to correct welding deficiencies discovered by visual inspection directed or performed by the Engineer, and any associated delays or expenses caused to the Contractor by performing these repairs, shall be at the Contractor's expense.

### **WELDING QUALITY CONTROL**

Welding quality control shall conform to the requirements in the AWS or other specified welding codes, the Standard Specifications, and these special provisions.

Unless otherwise specified, welding quality control shall apply to work welded in conformance with the provisions in the following:

- A. Section 49, "Piling," Section 52, "Reinforcement," Section 55, "Steel Structures," and Section 75-1.035, "Bridge Joint Restrainer Units," of the Standard Specifications
- B. "Structural Steel for Building Work" of these special provisions

Unless otherwise specified, Clauses 6.1.4.1 and 6.1.4.3 of AWS D1.1, paragraph 2 of Section 7.1.2 of AWS D1.4, and Clauses 6.1.3.2 through 6.1.3.3 of AWS D1.5 are replaced with the following:

The QC Inspector shall be currently certified as an AWS Certified Welding Inspector (CWI) in conformance with the requirements in AWS QC1, "Standard for AWS Certification of Welding Inspectors."

The QC Inspector may be assisted by an Assistant QC Inspector provided that this individual is currently certified as an AWS Certified Associate Welding Inspector (CAWI) in conformance with the requirements in AWS QC1, "Standard for AWS Certification of Welding Inspectors." The Assistant QC Inspector may perform inspection under the direct supervision of the QC Inspector provided the assistant is always within visible and audible range of the QC Inspector. The QC Inspector shall be responsible for signing all reports and for determining if welded materials conform to workmanship and acceptance criteria. The ratio of QC Assistants to QC Inspectors shall not exceed 5 to 1.

The Contractor shall designate in writing a welding Quality Control Manager (QCM). The QCM shall be responsible directly to the Contractor for the quality of welding, including materials and workmanship, performed by the Contractor and subcontractors.

The QCM shall be the sole individual responsible to the Contractor for submitting, receiving, reviewing, and approving all correspondence, required submittals, and reports to and from the Engineer. The QCM shall be a registered professional engineer or shall be currently certified as a CWI.

Unless the QCM is hired by a subcontractor providing only QC services, the QCM shall not be employed or compensated by any subcontractor, or by other persons or entities hired by subcontractors, who will provide other services or materials for the project. The QCM may be an employee of the Contractor.

The QCM shall sign and furnish to the Engineer, a Certificate of Compliance in conformance with the provisions in Section 6-1.07, "Certificates of Compliance," of the Standard Specifications for each item of work for which welding was performed. The certificate shall state that all of the materials and workmanship incorporated in the work, and all required tests and inspections of this work, have been performed in conformance with the details shown on the plans, the Standard Specifications, and these special provisions.

Welding inspection personnel or NDT firms to be used in the work shall not be employed or compensated by any subcontractor, or by other persons or entities hired by subcontractors, who will provide other services or materials for the project, except for the following conditions:

- A. The work is welded in conformance with AWS D1.5 and is performed at a permanent fabrication or manufacturing facility that is certified under the AISC Quality Certification Program, Category CBR, Major Steel Bridges and Fracture Critical endorsement F, when applicable.
- B. Structural steel for building work is welded in conformance with AWS D1.1 and is performed at a permanent fabrication or manufacturing facility that is certified under the AISC Quality Certification Program, Category STD, Standard for Steel Building Structures.

For welding performed at such facilities, the inspection personnel or NDT firms may be employed or compensated by the facility performing the welding provided the facility maintains a QC program that is independent from production.

Unless otherwise specified, an approved independent third party will witness the qualification tests for welders or welding operators. The independent third party shall be a current CWI and shall not be an employee of the contractor performing the welding. The Contractor shall allow the Engineer 15 days to review the qualifications and copy of the current certification of the independent third party.

Prior to submitting the Welding Quality Control Plan (WQCP) required herein, a prewelding meeting between the Engineer, the Contractor's QCM, and a representative from each entity performing welding or inspection for this project, shall be held to discuss the requirements for the WQCP.

Information regarding the contents, format, and organization of a WQCP, is available at the Transportation Laboratory and at:

<http://www.dot.ca.gov/hq/esc/Translab/OSM/smbresources.htm>

The WQCP shall include four copies each of all AWS welding codes which are applicable to the welding to be performed. These codes shall become the permanent property of the Department.

The Contractor shall submit to the Engineer, in conformance with the provisions in Section 5-1.02, "Plans and Working Drawings," of the Standard Specifications, 2 copies of a separate WQCP for each subcontractor or supplier for each item of work for which welding is to be performed.

The Contractor shall allow the Engineer 15 days to review the WQCP submittal after a complete plan has been received. No welding shall be performed until the WQCP is approved in writing by the Engineer.

An amended WQCP or any addendum to the approved WQCP shall be submitted to, and approved in writing by the Engineer, for proposed revisions to the approved WQCP. An amended WQCP or addendum will be required for revisions to the WQCP, including but not limited to a revised WPS; additional welders; changes in NDT firms, QC, or NDT personnel or procedures; or updated systems for tracking and identifying welds. The Engineer shall have 7 days to complete the review of the amended WQCP or addendum. Work affected by the proposed revisions shall not be performed until the amended WQCP or addendum has been approved.

After final approval of the WQCP, amended WQCP, or addendum, the Contractor shall submit 7 copies to the Engineer of the approved documents. A copy of the Engineer approved document shall be available at each location where welding is to be performed.

All welding will require inspection by the Engineer. The Contractor shall request inspection at least 3 business days prior to the beginning of welding for locations within California and 5 business days for locations outside of California. The Contractor shall request inspection at:

<http://www.dot.ca.gov/hq/esc/Translab/OSM/smbforms.htm>

Continuous inspection shall be provided when any welding is being performed. Continuous inspection, as a minimum, shall include having a QC Inspector within such close proximity of all welders or welding operators so that inspections by the QC Inspector of each welding operation at each welding location does not lapse for a period exceeding 30 minutes.

A daily production log for welding shall be kept for each day that welding is performed. The log shall clearly indicate the locations of all welding. The log shall include the welders' names, amount of welding performed, any problems or deficiencies discovered, and any testing or repair work performed, at each location. The daily report from each QC Inspector shall also be included in the log.

The following items shall be included in a Welding Report that is to be submitted to the Engineer within 15 days following the performance of any welding:

- A. A daily production log.
- B. Reports of all visual weld inspections and NDT.
- C. Radiographs and radiographic reports, and other required NDT reports.
- D. A summary of welding and NDT activities that occurred during the reporting period.
- E. Reports of each application of heat straightening.
- F. A summarized log listing the rejected lengths of weld by welder, position, process, joint configuration, and piece number.
- G. Documentation that the Contractor has evaluated all radiographs and other nondestructive tests and corrected all rejectable deficiencies, and that all repaired welds have been reexamined using the required NDT and found acceptable.

The following information shall be clearly written on the outside of radiographic envelopes: name of the QCM, name of the nondestructive testing firm, name of the radiographer, date, contract number, complete part description, and all included weld numbers, report numbers, and station markers or views, as detailed in the WQCP. In addition, all interleaves shall have clearly written on them the part description and all included weld numbers and station markers or views, as detailed in the WQCP. A maximum of 2 pieces of film shall be used for each interleave.

Reports of all visual inspections and NDT shall be signed by the inspector or technician and submitted daily to the QCM for review and signature prior to submittal to the Engineer. Corresponding names shall be clearly printed or typewritten next to all signatures. Reports of all NDT, whether specified, additional, or informational, performed by the Contractor shall be submitted to the Engineer.

The Engineer will review the Welding Report to determine if the Contractor is in conformance with the WQCP. Except for field welded steel pipe piling, the Engineer shall be allowed 15 days to review the report and respond in writing after the complete Welding Report has been received. Prior to receiving notification from the Engineer of the Contractor's conformance with the WQCP, the Contractor may encase in concrete or cover welds for which the Welding Report has been submitted. However, should the Contractor elect to encase or cover those welds prior to receiving notification from the Engineer, it is expressly understood that the Contractor shall not be relieved of the responsibility for incorporating material in the work that conforms to the requirements of the plans and specifications. Material not conforming to these requirements will be subject to rejection.

For field welded steel pipe piling, including bar reinforcement in the piling, the Contractor shall allow the Engineer 2 business days to review the Welding Report and respond in writing after the required items have been received. No field welded steel pipe piling shall be installed, and no reinforcement in the piling shall be encased in concrete until the Engineer has approved the above requirements in writing.

In addition to the requirements in AWS D1.1 and AWS D1.5, third-time excavations of welds or base metal to repair unacceptable discontinuities, regardless of NDT method, and all repairs of cracks require prior approval of the Engineer.

The Engineer shall be notified immediately in writing when welding problems, deficiencies, base metal repairs, or any other type of repairs not submitted in the WQCP are discovered, and also of the proposed repair procedures to correct them. For requests to perform third-time excavations or repairs of cracks, the Contractor shall include an engineering evaluation of the proposed repair. The engineering evaluation, at a minimum, shall address the following:

- A. What is causing each defect?
- B. Why the repair will not degrade the material properties?
- C. What steps are being taken to prevent similar defects from happening again?

The Contractor shall allow the Engineer 7 days to review these procedures. No remedial work shall begin until the repair procedures are approved in writing by the Engineer.

Clause 6.5.4 of AWS D1.5 is replaced with the following:

The QC Inspector shall inspect and approve each joint preparation, assembly practice, welding technique, joint fit-up, and the performance of each welder, welding operator, and tack welder to make certain that the applicable requirements of this code and the approved Welding Procedure Specification (WPS) are met. The QC Inspector shall examine the work to make certain that it meets the requirements of Clauses 3 and 6.26. The size and contour of all welds shall be measured using suitable gages. Visual inspection for cracks in welds and base metal, and for other discontinuities shall be aided by strong light, magnifiers, or such other devices as may be helpful. Acceptance criteria different from those specified in this code may be used when approved by the Engineer.

In addition to the requirements of AWS D1.5, Clause 5.12 or 5.13, welding procedures qualification for work welded in conformance with that code shall conform to the following requirements:

- A. Unless considered prequalified, fillet welds shall be qualified in each position. The fillet weld soundness test shall be conducted using the essential variables of the WPS as established by the Procedure Qualification Record (PQR).
- B. For qualification of joints that do not conform to Figures 2.4 and 2.5 of AWS D1.5, a minimum of 2 WPS qualification tests are required. The tests shall be conducted using both Figure 5.1 and Figure 5.3. The test conforming to Figure 5.1 shall be conducted in conformance with AWS D1.5, Clause 5.12 or 5.13. The test conforming to Figure 5.3 shall be conducted using the welding electrical parameters that were established for the test conducted conforming to Figure 5.1. The ranges of welding electrical parameters established during welding per Figure 5.1 in conformance with AWS D1.5, Clause 5.12, shall be further restricted according to the limits in Table 5.3 during welding per Figure 5.3.
- C. Multiple zones within a weld joint may be qualified. The travel speed, amperage, and voltage values that are used for tests conducted per AWS D1.5 Clause 5.13 shall be consistent for each pass in a weld joint, and shall in no case vary by more than  $\pm 10$  percent for travel speed,  $\pm 10$  percent for amperage, and  $\pm 7$  percent for voltage as measured from a predetermined target value or average within each weld pass or zone. The travel speed shall in no case vary by more than  $\pm 15$  percent when using submerged arc welding.
- D. For a WPS qualified in conformance with AWS D1.5 Clause 5.13, the values to be used for calculating ranges for current and voltage shall be based on the average of all weld passes made in the test. Heat input shall be calculated using the average of current and voltage of all weld passes made in the test for a WPS qualified in conformance with Clause 5.12 or 5.13.
- E. Macroetch tests are required for WPS qualification tests, and acceptance shall be per AWS D1.5 Clause 5.19.3.
- F. When a nonstandard weld joint is to be made using a combination of WPSs, a test conforming to Figure 5.3 may be conducted combining the WPSs to be used in production, provided the essential variables, including weld bead placement, of each process are limited to those established in Table 5.3.
- G. Prior to preparing mechanical test specimens, the PQR welds shall be inspected by visual and radiographic tests. Backing bar shall be 3 inches in width and shall remain in place during NDT testing. Results of the visual and radiographic tests shall comply with AWS D1.5 Clause 6.26.2, excluding Clause 6.26.2.2. Test plates that do not comply with both tests shall not be used.

## 10-1.02 WATER POLLUTION CONTROL

### GENERAL

Water pollution control work shall conform to the provisions in Section 7-1.01G, "Water Pollution," of the Standard Specifications, section of these special provisions entitled "Relations With California Regional Water Quality Control Board," and these special provisions.

The Contractor may obtain other National Pollutant Discharge Elimination System (NPDES) permits that apply to activities and mobile operations within or outside of the project limits including hot mix asphalt batch plants, material borrow areas, concrete plants, staging areas, storage yards, or access roads.

The Contractor shall perform water pollution control work in conformance with the requirements in the "Storm Water Pollution Prevention Plan (SWPPP) and Water Pollution Control Program (WPCP) Preparation Manual" and its addenda in effect on the day the Notice to Contractors is dated. This manual is referred to as the "Preparation Manual." Copies of the Preparation Manual may be obtained from:

State of California  
Department of Transportation  
Publication Distribution Unit  
1900 Royal Oaks Drive  
Sacramento, California 95815  
Telephone: (916) 445-3520

The Preparation Manual and other references for performing water pollution control work are available from the Department's Construction Storm Water and Water Pollution Control web site at:

<http://www.dot.ca.gov/hq/construc/stormwater/stormwater1.htm>

Before the start of job site activities, the Contractor shall provide training for project managers, supervisory personnel, and employees involved with water pollution control work. The training shall include:

- A. Rules and regulations
- B. Implementation and maintenance for:
  - 1. Temporary Soil Stabilization
  - 2. Temporary Sediment Control
  - 3. Tracking Control
  - 4. Wind Erosion Control

The Contractor shall designate in writing a Water Pollution Control Manager (WPCM). The Contractor shall submit a statement of qualifications describing the training, work history, and expertise of the proposed WPCM. The qualifications shall include either:

- A. A minimum of 24 hours of Department approved storm water management training described at Department's Construction Storm Water and Water Pollution Control web site.
- B. Certification as a Certified Professional in Erosion and Sediment Control (CPESC).

The WPCM shall be:

- A. Responsible for water pollution control work.
- B. The primary contact for water pollution control work.
- C. Have authority to mobilize crews to make immediate repairs to water pollution control practices.

The Contractor may designate one manager to prepare the SWPPP and a different manager to implement the plan. The WPCP preparer shall meet the training requirements for the WPCM.

## **STORM WATER POLLUTION PREVENTION PLAN**

The Contractor shall submit a Storm Water Pollution Prevention Plan (SWPPP) to the Engineer for approval. The SWPPP shall conform to the requirements in the Preparation Manual, the NPDES permit, and these special provisions. The SWPPP shall be submitted in place of the water pollution control program required by the provisions in Section 7-1.01G, "Water Pollution," of the Standard Specifications.

The SWPPP shall include water pollution control practices:

- A. For storm water and non-storm water from areas outside of the job site related to construction activities for this contract such as:
  - 1. Staging areas.
  - 2. Storage yards.
  - 3. Access roads.
- B. Appropriate for each season as described in "Implementation Requirements" of these special provisions.
- C. For activities or mobile operations related to all NPDES permits.

The SWPPP shall include a schedule that:

- A. Describes when work activities that could cause water pollution will be performed.
- B. Identifies soil stabilization and sediment control practices for disturbed soil area.
- C. Includes dates when these practices will be 25, 50, and 100 percent complete.
- D. Shows 100 percent completion of these practices before the rainy season.

The SWPPP shall include the following temporary water pollution control practices and their associated contract items of work as shown on the plans or specified in these special provisions:

- A. Temporary Sediment Control
  - 1. Temporary Reinforced Silt Fence (Type 1)
  - 2. Temporary Fiber Roll
- B. Tracking Control
  - 1. Temporary Construction Entrance
  - 2. Temporary Construction Roadway
- C. Wind Erosion Control
  - 1. Construction Site Management
- D. Non-Storm Water Management
  - 1. Construction Site Management
- E. Waste Management and Materials Pollution Control
  - 1. Construction Site Management

The SWPPP shall include the following contract items of work for permanent water pollution control as shown on the plans or as specified in these special provisions:

- A. Erosion Control (Type D)
- B. Fiber Rolls
- C. Move-In/Move-Out (Erosion Control)

Within 20 days after contract approval, the Contractor shall submit 3 copies of the SWPPP to the Engineer. The Contractor shall allow 20 days for the Engineer's review. If revisions are required, the Engineer will provide comments and specify the date that the review stopped. The Contractor shall revise and resubmit the SWPPP within 15 days of receipt of the Engineer's comments. The Engineer's review will resume when the complete SWPPP is resubmitted. When the Engineer approves the SWPPP, the Contractor shall submit 4 copies of the approved SWPPP to the Engineer. The Contractor may proceed with construction activities if the Engineer conditionally approves the SWPPP while minor revisions are being completed. If the Engineer fails to complete the review within the time allowed and if, in the opinion of the Engineer, completion of the work is delayed or interfered with by reason of the Engineer's delay, the Contractor will be compensated for resulting losses, and an extension of time will be granted, as provided for in Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

The SWPPP shall include a copy of the 401 Cert, ACOE 404, Fish and Game 1602 permit, and Fish and Game 2081 permit.

The SWPPP shall include a copy of the RWQCB 401 Certification, US Army Corps of Engineers 404 Permit, California Department of Fish & Game agreement.

The Contractor shall not perform work that may cause water pollution until the SWPPP has been approved by the Engineer. The Engineer's review and approval shall not waive any contract requirements and shall not relieve the Contractor from complying with Federal, State and local laws, regulations, and requirements.

The Contractor shall amend the SWPPP annually and shall resubmit it to the Engineer 25 days before the defined rainy season.

If there is a change in construction schedule or activities, the Contractor shall prepare an amendment to the SWPPP to identify additional or revised water pollution control practices. The Contractor shall submit the amendment to the Engineer for review within a time agreed to by the Engineer not to exceed the number of days specified for the initial submittal of the SWPPP. The Engineer will review the amendment within the same time allotted for the review of the initial submittal of the SWPPP.

If directed by the Engineer or requested in writing by the Contractor and approved by the Engineer, changes to the water pollution control work specified in these special provisions will be allowed. Changes may include addition of new water pollution control practices. The Contractor shall incorporate these changes in the SWPPP. Additional water pollution control work will be paid for as extra work in accordance with Section 4-1.03D, "Extra Work," of the Standard Specifications.

The Contractor shall keep a copy of the approved SWPPP at the job site. The SWPPP shall be made available when requested by a representative of the Regional Water Quality Control Board, State Water Resources Control Board, United States Environmental Protection Agency, or the local storm water management agency. Requests from the public shall be directed to the Engineer.

### **SAMPLING AND ANALYSIS**

The Contractor shall include a Sampling and Analysis Plan (SAP) in the SWPPP to monitor the effectiveness of the water pollution control practices. The Contractor shall prepare the SAP in conformance with the Preparation Manual.

The Contractor shall designate trained personnel to collect water quality samples. The personnel and training shall be documented in the SAP. Training shall consist of the following elements:

- A. SAP review,
- B. Health and safety review, and
- C. Sampling simulations.

In the SAP the Contractor shall describe the following water quality sampling procedures:

- A. Sampling preparation,
- B. Collection,
- C. Quality assurance and quality control,
- D. Sample labeling,
- E. Collection documentation,
- F. Sample shipping,
- G. Chain of custody,
- H. Sample numbering, and
- I. Precautions from the construction site health and safety plan.

The Contractor shall document sample collection during precipitation.

Samples to be analyzed in the field shall be taken by the Contractor's designated sampling personnel using collection and analysis methods, and equipment calibration specified by the manufacturer of the sampling equipment. Samples to be analyzed by a laboratory, shall be sampled, preserved, and analyzed by a State-certified laboratory in conformance with the requirements in 40 CFR Part 136, "Guidelines Establishing Test Procedures for the Analysis of Pollutants." The Contractor shall identify the State-certified laboratory, sample containers, preservation requirements, holding times, and analysis method in the SAP. A list of State-certified laboratories that are approved by the Department is available at:

<http://www.dhs.ca.gov/ps/ls/ELAP/html/lablist.htm>

### **Non-Visible Pollutants**

This project has the potential to discharge non-visible pollutants in storm water from the construction site. The Contractor shall include in the SAP a description of the sampling and analysis strategy to be implemented on the project for monitoring non-visible pollutants.

In the SAP the Contractor shall identify potential non-visible pollutants that will be present on the construction site associated with the following:

- A. Construction materials and wastes;
- B. Existing contamination due to historical site usage; or
- C. Application of soil amendments, including soil stabilization products, with the potential to alter pH or contribute toxic pollutants to storm water.

The Contractor shall show the locations planned for storage and use of the potential non-visible pollutants on the SWPPP Water Pollution Control Drawings.

The Contractor shall include in the SAP the following list of conditions that require sampling when observed during a storm water inspection:

- A. Materials or wastes containing potential non-visible pollutants are not stored under watertight conditions.
- B. Materials or wastes containing potential non-visible pollutants are stored under watertight conditions, but:
  - 1. A breach, leakage, malfunction, or spill is observed;
  - 2. The leak or spill has not been cleaned up before precipitation; and
  - 3. There is the potential for discharge of non-visible pollutants to surface waters or drainage system.
- C. Construction activities; such as application of fertilizer, pesticide, herbicide, methyl methacrylate concrete sealant, or non-pigmented curing compound; have occurred during precipitation or within 24 hours preceding precipitation, and have the potential to discharge pollutants to surface waters or drainage system.
- D. Soil amendments, including soil stabilization products, with the potential to alter pH levels or contribute toxic pollutants to storm water runoff have been applied, and have the potential to discharge pollutants to surface waters or drainage system (unless independent test data are available that demonstrate acceptable concentrations of non-visible pollutants in the soil amendment).
- E. Storm water runoff from an area contaminated by historical usage of the site has the potential to discharge pollutants to surface waters or drainage system.

The Contractor shall describe in the SAP the schedule for collecting a sample downhill from each non-visible pollutant source and an uncontaminated control sample, during the first 2 hours of discharge from precipitation during daylight hours that result in enough discharge for sample collection. If discharge flows to the non-visible pollutant source, a sample shall be collected immediately downhill from where the discharge enters the Department's right of way. If precipitation occurs again after at least 72 hours of dry weather the Contractor shall take new samples.

In the SAP the Contractor shall identify sampling locations for collecting downstream and control samples, and the reason for their selection. The control sampling location shall be selected so the sample does not come into contact with materials, wastes or areas associated with potential non-visible pollutants or disturbed soil areas. The Contractor shall show non-visible pollutant sampling locations on the SWPPP Water Pollution Control Drawings.

The Contractor shall identify in the SAP the analytical method to be used for downhill and control samples for potential non-visible pollutants on the project.

### **Analytical Results and Evaluation**

The Contractor shall submit a hard copy and electronic copy of water quality analytical results, and quality assurance and quality control data to the Engineer within 5 days of sampling for field analyses, and within 30 days for laboratory analyses. The Contractor shall also provide an evaluation of whether the downhill samples show levels of the tested parameter higher than in the control sample. If downhill or downstream samples show increased levels, the Contractor will assess the water pollution control measures, site conditions, and surrounding influences to determine the probable cause for the increase. As determined by the assessment, the Contractor will repair or modify water pollution control measures to address increases and amend the SWPPP as necessary. Electronic results (in one of the following file formats: .xls, .txt, .csv, .dbs, or .mdb) shall have the following information:

- A. Sample identification number.
- B. Contract number.
- C. Constituent.
- D. Reported value.
- E. Analytical method.
- F. Method detection limit.
- G. Reported limit.

The Contractor shall maintain the water quality sampling documentation and analytical results with the SWPPP on the project site.

If construction activities or knowledge of site conditions change such that discharges or sampling locations change, the Contractor shall amend the SAP in conformance with this section, "Water Pollution Control."

### **IMPLEMENTATION REQUIREMENTS**

The Contractor's responsibility for SWPPP implementation shall continue throughout any temporary suspension of work ordered in conformance with the provisions in Section 8-1.05, "Temporary Suspension of Work," of the Standard Specifications.

If the Contractor or the Engineer identifies a deficiency in the implementation of the approved SWPPP, the deficiency shall be corrected immediately, unless an agreed date for correction is approved in writing by the Engineer. The deficiency shall be corrected before the onset of precipitation. If the Contractor fails to correct the deficiency by the agreed date or before the onset of precipitation, the Department may correct the deficiency and deduct the cost of correcting deficiencies from payments.

If the Contractor fails to conform to the provisions of this section, "Water Pollution Control," the Engineer may order the suspension of work until the project complies with the requirements of this section.

### **Year-Round**

The Contractor shall monitor the National Weather Service weather forecast on a daily basis during the contract. The Contractor may use an alternative weather forecasting service if approved by the Engineer. Appropriate water pollution control practices shall be in place before precipitation.

The Contractor may discontinue earthwork operations for a disturbed area for up to 21 days and the disturbed soil area will still be considered active. When earthwork operations in the disturbed area have been completed, the Contractor shall implement appropriate water pollution control practices within 15 days, or before predicted precipitation, whichever occurs first.

### **Rainy Season**

The Contractor shall provide soil stabilization and sediment control practices during the rainy season between October 15 and April 15.

The Contractor shall implement soil stabilization and sediment control practices a minimum of 10 days before the start of the rainy season.

During the defined rainy season, the active disturbed soil area of the project site shall be not more than 1.0 acre. The Engineer may approve expansions of the active disturbed soil area limit if requested in writing. The Contractor shall maintain soil stabilization and sediment control materials on site to protect disturbed soil areas.

### **Rain Event Action Plan**

The contractor shall prepare a written Rain Event Action Plan (REAP) as part of the SWPPP. The REAP must describe work to be done to protect exposed areas of the jobsite before predicted storms. The REAP must include:

1. Title sheet
2. Table of contents
3. Description of the storm event requiring the mobilization of crews and protection of exposed areas:
  - 3.1. Precipitation predicted by the National Weather Service to occur within 72 hours and have one of the following:
    - 3.1.2. Probability of at least 40 percent
    - 3.1.2. Quantity of at least 0.25 inches
4. Pre-storm activities including:
  - 4.1. Responsibilities of the WPC manager
  - 4.2. Responsibilities of the crew and crew size
  - 4.3. Stabilization for active and inactive disturbed soil areas
  - 4.4. Stockpile management
5. Activities to be done during storm events including:
  - 5.1. Responsibilities of the WPC manager
  - 5.2. Responsibilities of the crew and crew size
  - 5.3. Stabilization for active and inactive disturbed soil areas
  - 5.4. Stockpile management
  - 5.5. BMP maintenance
6. Diagram showing drainage patterns including:
  - 6.1. Surface flow and subsurface drainage systems
  - 6.2. Run-on flows to the jobsite
  - 6.3. Flows to drainage inlets and other drainage facilities
  - 6.4. Modifications to existing surface and subsurface drainage systems
  - 6.5. Impacts of current work and construction phase
7. Coordination with subcontractors
8. Description of flood contingency measures

The REAP must be revised whenever the SWPPP is amended:

1. At the start of the rainy season
2. When there is a change in the construction schedule or activities

The WPC manager must implement the REAP including mobilizing crews to complete activities before precipitation occurs.

### **INSPECTION AND MAINTENANCE**

The WPCM shall inspect the water pollution control practices identified in the SWPPP as follows:

- A. Before a forecasted storm,
- B. After precipitation that causes site runoff,
- C. At 24-hour intervals during extended precipitation,
- D. On a predetermined schedule, a minimum of once every 2 weeks outside of the defined rainy season, and
- E. On a predetermined schedule, a minimum of once a week during the defined rainy season.

The WPCM shall oversee the maintenance of the water pollution control practices.

The WPCM shall use the Storm Water Quality Construction Site Inspection Checklist provided in the Preparation Manual or an alternative inspection checklist provided by the Engineer. A copy of the completed site inspection checklist shall be submitted to the Engineer within 24 hours of finishing the inspection.

The Contractor may request approval from the Engineer to suspend inspections of water pollution control practices after work except plant establishment is complete. The Engineer's approval is contingent on approval from the Regional Water Quality Control Board. The Contractor shall not suspend inspections until written approval from the Engineer is received.

### **REPORTING REQUIREMENTS**

If the Contractor identifies discharges into surface waters or drainage systems causing or potentially causing pollution, or if the project receives a written notice or order from a regulatory agency, the Contractor shall immediately inform the Engineer. The Contractor shall submit a written report to the Engineer within 7 days immediately of the discharge, notice or order. The report shall include the following information:

- A. The date, time, location, and nature of the operation, type of discharge and quantity, and the cause of the notice or order.
- B. The water pollution control practices used before the discharge, or before receiving the notice or order.
- C. The date of placement and type of additional or altered water pollution control practices placed after the discharge, or after receiving the notice or order.
- D. A maintenance schedule for affected water pollution control practices.
- E. Daily visual inspections for waste releases of all vehicles and equipment parked or operating on temporary access roads and staging areas adjacent to storm drain system or water courses, Environmentally Sensitive Areas (ESA) defined elsewhere in these provisions.

### **Annual Certifications**

By June 15 of each year, the Contractor shall complete and submit to the Engineer an Annual Certification of Compliance, as contained in the Preparation Manual.

### **PAYMENT**

During each estimate period the Contractor fails to conform to the provisions in this section, "Water Pollution Control," or fails to implement the water pollution control practices shown on the plans or specified elsewhere in these special provisions as items of work, the Department will withhold 25 percent of the progress payment.

Withholds for failure to perform water pollution control work will be in addition to all other withholds provided for in the contract. The Department will return performance-failure withholds in the progress payment following the correction of noncompliance.

The contract lump sum price paid for prepare storm water pollution prevention plan shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all the work involved in preparing, obtaining approval of, and amending the SWPPP and inspecting water pollution control practices as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Payments for prepare storm water pollution prevention plan will be made as follows:

- A. After the SWPPP has been approved by the Engineer, 50 percent of the contract item price for prepare storm water pollution prevention plan will be included in the monthly progress estimate.
- B. Forty percent of the contract item price for prepare storm water pollution prevention plan will be paid over the life of the contract.
- C. After acceptance of the contract in conformance with the provisions in Section 7-1.17, "Acceptance of Contract," of the Standard Specifications, payment for the remaining 10 percent of the contract item price for prepare storm water pollution prevention plan will be made in conformance with the provisions in Section 9-1.07A, "Payment Prior to Proposed Final Estimate."

Storm water sampling and analysis will be paid as extra work as provided in Section 4-1.03D, "Extra Work," of the Standard Specifications. No payment will be made for the preparation, collection, analysis, and reporting of storm water samples where appropriate water pollution control practices are not implemented before precipitation or if a failure of a water pollution control practice is not corrected before precipitation.

Implementation of water pollution control practices in areas outside the highway right of way not specifically provided for in the SWPPP or in these special provisions will not be paid for.

Water pollution control practices for which there are separate contract items of work will be measured and paid for as those contract items of work.

Preparation of the REAP and implementation of activities will be paid for as extra work as provided in Section 4-1.03D, "Extra Work," of the Standard Specifications.

## **10-1.025 TURBIDITY CONTROL**

### **GENERAL**

#### **Summary**

This work includes preparing a turbidity control plan, monitoring turbidity, and implementing control measures to limit transport of disturbed sediment during in-water construction operations.

#### **Definitions**

**turbidity:** A physical characteristic of water that is an expression of the optical property that causes light to be scattered and absorbed by particles and molecules rather than transmitted in straight lines through a water sample. Suspended matter or impurities that interfere with the clarity of the water cause turbidity. These impurities may include clay, silt, and finely divided inorganic and organic matter.

**natural background turbidity:** The ambient clarity of the water adjacent to the job site at locations not affected by the work.

**nephelometric turbidity units (NTU):** A standard measure of turbidity based on light scatter measured with a nephelometer.

**receiving water:** The water in or adjacent to the job site that may be impacted by sediment disturbance caused by construction activities

#### **Submittals**

Submit a turbidity control plan for in-water work or review and approval 30 days before beginning work in marine environments. Allow 15 days for review and approval of the plan. If revisions are required, revise and resubmit the plan within 10 days of receipt of the Engineer's comments and allow 5 days for review and approval of the revisions.

The Turbidity Control Plan must describe:

1. Equipment used to do in-water work,
2. Operation schedule,
3. Deployment of turbidity control measures,
4. Containment contingency
5. Turbidity monitoring program.

The turbidity monitoring program must include daily inspection reports during in-water work. The reports must document water quality measurements, visual observations, including photographs, and inspection results in conformance with subsection "CONSTRUCTION" subsections "Water Quality Measurements" and "Visual Observation and Inspection" of this section and must be certified as true and accurate and signed by those who gather the information.

Furnish three initial copies of the plan to the Engineer and equal copies following subsequent revisions and updating. Final approval of the plan will be subject to field testing.

Demonstrate that the proposed turbidity control measures work as intended under actual working and field conditions. At the time of approval, incorporate the plan into the approved Storm Water Pollution Prevention Plan using the established amendment process as described within "Water Pollution Control" of these special provisions.

The State is not liable for failure to accept all or any portion of an originally submitted or revised turbidity control plan, nor for any delays to the work due to failure to submit an acceptable turbidity control plan.

#### **Regulatory Water Quality Limitations**

During in-water work, the allowable increase in the receiving water turbidity 300 feet downstream of the work is 15 NTU over the natural background turbidity.

#### **Quality Assurance**

You are responsible for the costs and liabilities imposed by law if you fail to comply with the provisions set forth in this section "Turbidity Control," including but not limited to, compliance with the applicable provisions of permits, and Federal, State and local regulations. Costs and liabilities include, but are not limited to, fines, penalties, and damages whether assessed against the State or you, including those levied under the Federal Clean Water Act and the State Porter Cologne Water Quality Act.

## **CONSTRUCTION**

### **Operation**

All in-water work that can cause turbidity must have turbidity control measures implemented to ensure that turbidity complies with regulatory rules, policies, and permits.

For information on pile removal, refer to the "Establish Marine Access" of these special provisions.

### **Monitoring**

Perform compliance monitoring for turbidity in conformance with regulatory rules, policies, permits, and a turbidity monitoring program described in the turbidity control plan.

### **Water Quality Measurements**

Measure turbidity during in-water work as follows:

1. Take measurements at the background and receiving water sampling locations one hour before starting the work to assess the relative conditions in the receiving water.
2. Start measuring in the receiving water 15 minutes after starting the work.
3. Measure every 2 hours during the work.
4. Take additional measurements whenever there is a noticeable effect on the color or clarity of the receiving water.
5. If a measurement exceeds the water quality limitations, confirm the exceedance by taking an additional measurement no more than 15 minutes after the initial measurement and confirm that the natural background condition has not changed.
6. Monitoring may be discontinued if, in the opinion of the Engineer, the receiving water measurements are consistently below the water quality limitations.
7. Measure the receiving water within 300 feet downstream (with the tide) of the work.
8. Measure the natural background turbidity at a location that is unaffected by the work, at least 100 feet upstream (against the tide) of the work.

The receiving water and natural background measurements must be depth-averaged when the water depth is greater than 3 feet. Obtain depth-averaged measurements by taking measurements from 3 points within the water column and averaging the 3 measurements: one at 1 foot below the surface, one at mid depth, and one at 1 foot above the bottom. In receiving waters that are less than 3 feet in depth, only one measurement must be taken at 1 foot below the surface.

Obtain field-recorded data using a meter approved by the Engineer. The meter must be a handheld direct-reading instrument connected to a submersible turbidity sensor. Submit a copy of the manufacturer specifications for all measuring instruments used, including the operating instructions, calibration instructions, and calibration log, as part of the turbidity control plan submittal. Perform all field calibrations in conformance with the manufacturer's instructions in the presence of the Engineer. Transmit copies of the field-recorded data electronically to the Engineer at the end of each working day.

### **Visual Observation and Inspection**

Before starting in-water work inspect and document the existing condition of the receiving waters. Provide photo documentation of the surrounding work area extending 200 feet upstream and 200 feet downstream of the work.

Complete a daily inspection of the receiving water during in-water work. Observations must include:

1. The presence or absence of:
  - 1.1 Discoloration
  - 1.2 Odor
  - 1.3 Floating or suspended material
  - 1.4 Aquatic life
  - 1.5 Visible films, sheens or coatings
  - 1.6 Potential nuisance conditions
2. The wind direction and velocity
3. Tidal state
4. Time, and date

Supplement the observations with photographs and the name and signature of the person conducting the inspection.

If you do not conform to the provisions of "Turbidity Control", the Engineer will order the suspension of specific aquatic construction operations. No further work will be allowed on the ongoing operation until the turbidity control measures are adequate and, if required by the Engineer, a revised turbidity control plan is accepted. Temporary suspension of work will conform to the provisions in Section 8-1.05, "Temporary Suspension of Work", of the Standard Specifications.

If a deficiency in any aspect of the implementation of the approved turbidity control plan or amendments is identified, correct the deficiency immediately. You may correct the deficiency at a later date if approved by the Engineer in writing.

If the identified deficiency is not corrected by the date agreed upon, the project is in noncompliance.

During each estimate period the Contractor fails to conform to the provisions in this section, "Turbidity Control," the Department will withhold 25 percent of the progress payment. Withholds for failure to comply with turbidity control will be in addition to all other withholds provided for in the contract. The Department will return performance-failure withholds in the progress payment following the correction of noncompliance.

### **Removal**

Remove and dispose of control measures in accordance with section 7-1.13, "Disposal of Material Outside the Highway Right of Way" of the Standard Specifications.

### **MEASUREMENT AND PAYMENT**

The contract lump sum price paid for turbidity control will include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in turbidity control complete in place, including development and submittal of the turbidity control plan, producing daily inspection reports, and removal and disposal of all control measures when no longer necessary, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

## 10-1.11 TEMPORARY CONSTRUCTION ROADWAY

### GENERAL

#### Summary

This work includes constructing, maintaining, and removing temporary construction roadway to provide temporary access.

The SWPPP must describe and include the use of temporary construction roadway as a water pollution control practice for tracking control.

#### Submittals

Submit a Certificate of Compliance under Section 6-1.07, "Certificates of Compliance," of the Standard Specifications for:

1. Temporary roadway fabric
2. Rock

### MATERIALS

#### Temporary Roadway Fabric

Temporary roadway fabric must comply with the specifications for rock slope protection fabric (Class 10) in Section 88-1.06, "Channel and Shore Protection," of the Standard Specifications.

#### Rock

Rock must be Type A.

Rock (Type A) must comply with:

1. Requirements under Section 72-2.02, "Materials," of the Standard Specifications
2. Following sizes:

Square Screen Size (inch)	Percentage Passing	Percentage Retained
6	100	0
3	0	100

### CONSTRUCTION

Prepare location for temporary construction roadway by:

1. Removing vegetation to ground level and clearing away debris
2. Grading the ground to a uniform plane
3. Grading the ground surface to drain
4. Removing sharp objects that could damage the fabric
5. Compacting the top 1.5 feet of soil to at least 90 percent relative compaction

Install temporary construction roadway by:

1. Positioning fabric along the length of the roadway
2. Overlapping the sides and ends of fabric by at least 12 inches
3. Spreading rock over the fabric in the direction of traffic
4. Covering fabric with rock within 24 hours
5. Keeping a 6 inch layer of rock over the fabric to prevent damage to the fabric by spreading equipment
6. Prohibiting driving on the fabric until the rock is spread

Repair fabric damaged during rock spreading by placing a new piece of fabric over the damaged area. The piece of fabric must be large enough to cover the damaged area and provide a minimum 18-inch overlap on all edges.

### **Maintenance**

Maintain temporary construction roadway to minimize generation of dust and tracking of soil and sediment onto public roads. If dust or sediment tracking increases, place additional rock unless the Engineer approves another method.

Repair temporary construction roadway if:

1. Fabric is exposed
2. Depressions in the roadway surface develop
3. Rock is displaced

Repair temporary construction roadway within 24 hours of discovering damage unless the Engineer approves a longer period.

During use of temporary construction roadway, do not allow soil, sediment, or other debris tracked onto pavement to enter storm drains, open drainage facilities, or watercourses. If material is tracked onto pavement, remove it within 24 hours unless the Engineer approves a longer period.

If your vehicles, equipment, or activities disturb or displace temporary construction roadway, repair temporary construction roadway at your expense.

The Department does not pay maintenance costs for cleanup, repair, removal, disposal, or replacement due to improper installation or your negligence.

### **Removal**

When the Engineer determines that the temporary construction roadway is not required, it must be removed and disposed of under Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications.

Ground disturbance, including holes and depressions, caused by the installation and removal of the temporary construction roadway must be backfilled and repaired under Section 15-1.02, "Preservation of Property," of the Standard Specifications. The top 4 to 6 inches of soil must be disked prior to application of Erosion Control (Type D).

### **MEASUREMENT AND PAYMENT**

Temporary construction roadway is measured by the cubic yard for rock placed.

The contract price paid per cubic yard for rock placed for temporary construction roadway includes full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in constructing temporary construction roadway, complete in place, including temporary roadway fabric and removal of temporary construction roadway, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

No additional compensation will be made if the temporary construction roadway is relocated during the course of construction.

The State and you share the cost of maintaining the temporary construction roadway. The State determines the maintenance cost under Section 9-1.03, "Force Account Payment," of the Standard Specifications and pays you one half of that cost.

## **10-1.15 ESTABLISH MARINE ACCESS**

### **GENERAL**

This work shall consist of furnishing, erecting, maintaining and removing barges, trestles and other facilities to establish marine access to the job site. This work shall be separate from and in addition to the work specified in Section 11, "Mobilization," of the Standard Specifications.

Marine access may be established to provide access to the jobsite. It must be within the limits as shown on the plans, and must comply with the permits, licenses, agreements, and certifications as specified in "Permits, Licenses, Agreements, and Certifications" and "Order of Work" of these special provisions.

### **SUBMITTALS**

Within 4 weeks after contract approval, the Contractor shall submit, for approval by the Engineer, in accordance with the provisions in "Working Drawings," of these special provisions, calculations and working drawings of any access trestle and other temporary facilities that are to be constructed. The working drawing submittal shall include the locations of all existing battered piles and demonstrate that new piling or foundations for access trestle or other temporary facility will not conflict with the existing battered piles. The Contractor shall allow the Engineer 15 days to review and approve the working drawings and supplemental calculations. If revisions are required, as determined by the Engineer, the Contractor shall revise and resubmit the working drawings and calculations within 10 days of receipt of the Engineer's comments and shall allow 15 days for the Engineer to review the revisions.

The Contractor shall submit, for approval by the Engineer, a schedule of values detailing the cost breakdown of the contract lump sum price for establish marine access. The schedule of values shall reflect the items, work, quantities and costs required to establish marine access to the job site, including as a minimum: the initial mobilization of marine access facilities, monthly facility and equipment rental, monthly maintenance, and demobilization. The Contractor shall be responsible for the accuracy of the quantities and costs used in the schedule of values submitted for approval.

The sum of the amounts for the items and work listed in the schedule of values shall be equal to the contract lump sum price for establish marine access.

When approved in writing by the Engineer, the schedule of values will be used to determine progress payments for establish marine access during the progress of the work. No partial payment for establish marine access will be made until the schedule of values is approved in writing by the Engineer.

### **CONSTRUCTION**

The Contractor's attention is directed to the existence of battered piles in the vicinity of bridge piers. The Contractor shall locate existing battered piling prior to driving any piles.

The Contractor shall use hollow steel shell piles less than or equal to 24 inches diameter.

Vibratory hammer shall be used in driving piles. A "soft start" technique shall be used to install each pile with the vibratory hammer. Each pile will be vibrated at low energy for 15 seconds followed by a 1 minute waiting period during which no vibration occurs. This procedure shall be repeated an additional two times prior to vibrating piles into place.

No more than six piles can be installed on one day.

Pile installation must occur during daylight hours from one hour after sunrise until one hour before sunset.

If turbidity levels approach or exceed the maximum levels allowed under the SWPPP and RWQCB Water Quality Certification, the Contractor shall cease pile installation until the turbidity returns to permissible levels.

The Contractor shall stop pile installation activities when directed by the Engineer as recommended by the Department biological monitors to protect marine mammals entering the project area or if the Department biological monitors determine that the sound attenuation system is not effectively reducing sound levels to within the permitted parameters, defined below. Marine mammals will be allowed to leave by their own volition prior to resuming pile installation activities as directed by the Engineer and as recommended by the biological monitors.

No more than one pile per day can be proof tested with an impact hammer.

A sound attenuation system must be used during proof testing with an impact hammer.

The sound attenuation system must ensure that sound levels in excess of 206 dB<sub>peak</sub> re: 1 microPa, 187 db SEL re: 1 microPa, 183 dB SEL re: 1 microPa, and 190 dB<sub>RMS</sub> re: 1 microPa do not occur at distances greater than 30 ft from the pile being proof tested with an impact hammer.

## **REMOVAL**

When no longer required, marine access facilities must be completely removed between August 1 to October 31.

Comply with the provisions in "Turbidity Control," of these special provisions. The Contractor must:

1. Remove piles using vibratory extraction.
2. Remove piles slowly.
3. Break the bond between the pile and sediment before beginning removal.
4. Do not remove adhering sediment from the pile while it is over water.
5. Place removed piles in a containment vessel to capture sediment and debris.
6. If turbidity levels approach or exceed the maximum levels allowed under the SWPPP and WQCB Water Quality Certification, stop pile removal activities until the turbidity returns to ermissible levels.

Removed materials shall become the property of the Contractor and shall be disposed of in conformance with the provisions in Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications.

## **PAYMENT**

The contract lump sum price paid for establish marine access shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in designing, constructing, maintaining, and removing marine access facilities, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Full compensation for pile proof testing including the required sound attenuation system shall be considered as included in the contract lump sum price paid for establish marine access and no separate payment will be made therefor.

The adjustment provisions in Section 4-1.03, "Changes," of the Standard Specifications shall not apply to the contract lump sum price for establish marine access. Full compensation for damages due to delays shall be considered as included in the payments made in accordance with "Time-Related Overhead" of these special provisions and Section 8-1.09, "Right of Way Delays," of the Standard Specifications and no additional compensation will be allowed therefor.

#### **10-1.41 INSTALL SEISMIC MONITORING CASING**

Installation of seismic monitoring casing shall consist of drilling into soil and furnishing and installing PVC casings for seismic monitoring equipment at the six downholes as shown on the structure electrical plans. The Engineer and CGS personnel will mark the exact location for each downhole. Seismic monitoring casing shall be in accordance with the details shown on the structure electrical plans and these special provisions.

Installation of seismic monitoring casing includes the following operations, in the following order:

1. Drill one 4.5" diameter hole for the deepest hole at each downhole array location, and collect soil samples, and prepare a log of test borings and boring report.
2. Allow State forces to perform P-S suspension logging.
3. Drill 8" diameter hole for installation of casing.
4. Install 4" diameter screw joint polyvinyl chloride (PVC) pipe casing, including equipment furnished by the State and attached to the bottom of the casing.
5. Grout the annulus between the 8" diameter hole and the 4" diameter casing, and install pipe cap and enclosure. The grout mixture shall consist of 4 sacks of cement and 1/2 sack of bentonite per 50 gallons of water. The grout mixture for the lowest 20' of each hole will be determined by the Engineer and the CGS personnel.
6. All other downholes at each array shall require steps 3, 4 and 5 above.

#### **Seismic Monitoring Casing**

The seismic monitoring casing shall consist of 4" diameter Schedule 80 screw joint (ASTM F480 threads, flush) polyvinyl chloride PVC pipe. Each screw joint shall include an O-ring and shall be sealed with an O-ring lubricant. The casing will have a specially formed sealed cap (Bishops Hat) at the bottom with instrumentation cables extending up through the casing. The Bishops Hat and instrumentation cables will be furnished by State and installed by the Contractor.

CGS personnel will be on-site during installation of 4" PVC downhole casings by the Contractor, for six boreholes between Pier 35 and Pier 36 as shown on plans. CGS will provide specially formed sealed cap assemblies (Bishops Hat) for installation at bottom of each downhole casing by the Contractor.

#### **BORINGS**

Borings shall consist of drilling holes, taking samples, logging borings and furnishing test boring submittals to the Engineer.

The "Soil and Rock Logging, Classification, and Presentation Manual (June 2007) with Erratum" is included in the "Materials Information" available to the Contractor as provided for in Section 2-1.03, "Examination of Plans, Specifications, Contract, and Site of Work," of the Standard Specifications.

The Contractor shall drill borings at the center of each downhole location as shown on the plans and as directed by the Engineer. The Contractor shall notify the Engineer in writing not less than 30 days in advance of drilling borings.

All borings shall be made under site supervision of a Geologist. The log of test borings shall be stamped by, and the test boring submittal shall be signed by a geologist who is registered in the State of California and has at least five years of geotechnical engineering experience of deep foundations in both soil and rock.

Borings shall be made by rotary drill methods.

One boring shall be drilled and logged to a depth equal to that of the deepest hole at each downhole array location. Other downholes shall be drilled to the depths shown on the plans.

Soil classification and descriptions shall conform to the requirements for visual-manual procedures in ASTM D 2488.

After sample boxes are filled, and prior to removal from the drilling platform, samples shall be photographed. All soil samples photographs shall be color, 5" x 7" and labeled with the bore hole number, sample elevation, scale, and date and time photographed.

The soil samples shall be retained in core boxes that are labeled with the job contract number, the site location, and the sample elevation. Core boxes shall become the property of the State and will be removed from the job site by the State. Prior to their removal from the job site, the Contractor shall preserve and secure the soil samples in a weather protected facility until notified by the Engineer.

The log of test borings including the soil classification shall conform to the document "Soil and Rock Logging, Classification, and Presentation Manual (June 2007) with Erratum," published by the Engineering Service Center, Caltrans.

After completion of all borings, the Contractor shall furnish to the Engineer a test boring submittal that includes photographs of soil samples, a boring report and the log of test borings.

The log of test borings shall conform with the provisions in Section 5-1.02, "Plans and Working Drawings," of the Standard Specifications. All log of test borings shall be 22" x 34" in size. For initial review, 4 sets of drawings shall be submitted to the Engineer. Within 3 weeks after final approval of the test boring submittal, one set of the corrected prints on good quality bond paper, 22" x 34" in size, prepared by the Contractor shall be furnished to the Office of Structure Design, Documents P.O. Box 942874, MS#9, Sacramento, CA 94274-0001 (1801 30th Street, Sacramento, CA 95816) and 7 sets furnished to the Engineer.

Log of test borings shall show the State assigned designations for the contract number, bridge number, full name of the structure as shown on the contract plans, and District-County-Route-Post mile on each sheet. The test boring/geotechnical subcontractor name, address, and phone number shall be shown on the working drawings. Each sheet shall be numbered in the lower right hand corner and shall contain a blank space in the upper right hand corner for future contract sheet numbers.

The following shall be shown on the log of test borings:

1. Stationing and offset of boring.
2. Northing and easting coordinates.
3. Reference elevation and datum.
4. Boring start and completion date.
5. Geotechnical notes and miscellaneous explanations.
6. Drill bit and sampler types and diameters.
7. Percent of core recovery and RQD.
8. Sample numbers.
9. Depth increments of borings.
10. Graphic log.
11. Soil classifications and descriptions.
12. Log symbol legend.
13. Signature and seal of the Geologist or Civil Engineer.

The boring report shall include the following:

1. Summary of drilling methods, drilling equipment, drill platforms, and any drilling difficulties encountered.
2. Location map of the surveyed position of the borings relative to the existing pier (in California Coordinate System and bridge stationing).
3. Bore hole surveying notes.
4. Photographs of soil samples.
5. Copies of original daily drilling notes.

The Engineer will notify the Contractor in writing when a boring submittal is complete and approved. All materials utilized in making boring shall be disposed of in accordance with the provisions in Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications, and to the requirements of the non-storm water discharges in the "Caltrans Storm Water Quality Handbook, Construction Contractor's Guide and Specifications" as specified in the Section entitled "Water Pollution Control" elsewhere in these special provisions.

### **P-S SUSPENSION LOGGING**

P-S suspension logging, consisting of P-wave and S-wave (dilatational wave and shear wave) velocity measurements, will be made by State forces. P-S suspension logging will be made after completion of the Contractor's boring, sampling, and logging operations at each Downhole location.

### **INSTALL CASING**

The seismic monitoring casing shall be installed into an 8" diameter hole. The hole shall be drilled by mud rotary methods and shall be centered over the 4.5" diameter hole described in the section "Borings" in these special provisions.

The 4" diameter pipe casing shall be installed from 8" above the ground surface to the depth as shown on the plans unless directed by the Engineer (using the P-S suspension logs).

Grout shall be delivered at the low end of the void being filled by methods that prevent the mixing of grout with water during charging of the grout delivery tubes and placement of the grout. Until at least 10' of grout has been placed, the tips of grout delivery tubes shall be within 6" of the bottom of the void being filled. The grout delivery tubes may be raised during grouting, providing that the embedment of the tips are maintained at least 6' below the top surface of the grout.

Sufficient grout shall be injected to fill the annular space between the casing and the hole and be expelled at the top of the hole until there is no evidence of entrapped air or water. A minimum grout head of 2' shall be maintained above the top of the hole until the grout has set.

All residue from the grouting operation shall be removed after completing the grouting operations and shall be disposed of in accordance with Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications, and to the requirements of the non-storm water discharges in the "Caltrans Storm Water Quality Handbook, Construction Contractor's Guide and Specifications" as specified in the Section entitled "Water Pollution Control" elsewhere in these special provisions.

#### **PAYMENT**

Full compensation for install seismic monitoring casing including furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in furnishing and installing the casings, complete in place, including drilling into soil, collecting soil samples, preparing a log of test borings and boring report, grouting, and disposing of material resulting from drilling holes and grouting, shall be considered as included in the contract lump sum price paid for seismic monitoring electrical system and no additional compensation will be allowed therefore.

#### **10-1.46 FURNISH SEISMIC ISOLATION BEARING**

This work shall consist of furnishing pre-approved seismic isolation bearings as manufactured and prototype-tested by Earthquake Protection Systems, and testing seismic isolation bearings in conformance with the details shown on plan sheets "Isolation Bearing, Details No. 1" and "Isolation Bearing, Details No. 2" and as specified in these special provisions.

Seismic isolation bearings shall be friction pendulum type in conformance with the requirements in "Friction Pendulum Bearings" of these special provisions.

Attention is directed to "Supplemental Project Information" of these special provisions for Purchase Agreement for the Supply of Friction Pendulum Bearings (EPS Purchase Agreement). Within 30 days of contract approval, the Contractor shall execute the EPS Purchase Agreement for the Supply of Friction Pendulum Bearings for Antioch Bridge Retrofit Project.

Seismic isolation bearings shall be installed in conformance with the provisions in "Install Seismic Isolation Bearings" of these special provisions.

Use of each seismic isolation bearing is contingent upon successful performance of the bearing under testing as specified in "Proof Testing" of these special provisions.

#### **FRICITION PENDULUM BEARINGS**

Friction pendulum bearings are the only seismic isolation bearings known to the State that can meet the requirements and time constraints of this contract.

Bearings shall be as detailed in "Antioch Bridge Final Prototype Bearing Report" and as specified in "Materials and Fabrication" of these special provisions.

Bearings consist of an articulated slider that slides along a stainless steel concave spherical surface. The articulated slider allows articulation between the concave surfaces. A self-lubricating bearing liner material is bonded to the sliding surface of the articulated slider and to its housing. The concave sliding surface is surrounded by an ultimate displacement limiting device identified as a retainer ring. The bearing includes a method for future viewing of the interior bearing surface in situ, a wind lock system, bolt holes for anchorage to the bridge structure, and a protective environmental seal.

The bearing shall be assembled at the factory with suitable temporary assembly ties. The entire assembly is to be shipped as a unit and remain intact when uncrated and installed.

#### **Sole Source Supplier**

Friction Pendulum Bearings are a proprietary seismic isolation bearing system that is manufactured and supplied by:

Earthquake Protection Systems, Inc.  
451 Azuar Drive, Bldg 759  
Mare Island, Vallejo, California 94592  
(707) 644-5993  
Fax: (707)644-5995

Contact: Stanley Low

Earthquake Protection Systems, Incorporated (EPS) has agreed to design and furnish the friction pendulum bearings and other services described in these special provisions at the guaranteed price of \$86,130.00 per Type I bearing (FP23878-27), total 12 and \$37,175.00 per Type II bearing (FP15663-21), total 70 under the terms and conditions as specified in the EPS Purchase Agreement. The above quoted prices do not include sales tax. Bearings will be permanently marked by the manufacturer on 2 of 4 sides. The markings shall consist of bearing model number, production lot number, contract number, and date of manufacture.

The guaranteed bearing price includes manufacturing bearings, providing 6 maintenance manuals, and performing proof testing on all bearings at the EPS facility. Charges for storing bearings shall be 0.5% of the bearing prices for each month bearings are stored beyond 3 months after the ready-to-ship dates. The price also includes cleaning and painting the of bearings, advice during proof testing, and providing all components and sealants recommended by the manufacturer for installation of the bearing.

The guaranteed bearing price does not include sales tax or delivery of the bearings to the Contractor's on-site storage, to the job site, or to the final storage location from the interim storage site. The guaranteed price does not include the cost of shipping to and from, and quality assurance proof testing at the California Department of Transportation (Caltrans) SRMD facility. The guaranteed bearing price also does not include installation of the bearings, including furnishing and installing anchorage components and associated installation hardware or inspection and advice by a qualified representative of the bearing manufacturer during installation.

The manufacturer's charge for a field service representative is specified in the EPS Purchase Agreement. Charges for any other services or changes that the Contractor may request shall be as specified in the EPS Purchase Agreement.

The bearing delivery schedule shall be as specified in the EPS Purchase Agreement.

Bearings shall be manufactured as complete units by the manufacturer of the bearings, including all required components.

The Contractor shall notify the Engineer at least 15 days prior to start of proof testing.

### **DESIGN REQUIREMENTS**

The bearing system shall conform to the design criteria for the loading conditions; maximum lateral forces, displacements, and rotations; hysteretic behavior; and performance criteria as shown on plan sheets "Isolation Bearing, Details No. 1" and "Isolation Bearing, Details No. 2," as specified in these special provisions, and as directed by the Engineer.

### **MATERIALS AND FABRICATION**

The concave sliding surface of the bearing system shall be located at the bottom of the bearings to limit eccentric loads on the sole plate.

Materials, manufacturing, and testing shall be in conformance with EPS's manufacturing standards and specifications.

The external bearing dimensions and bolt hole locations used for bearing installation shall conform to the dimensions and tolerances shown on plan sheets "Isolation Bearing, Details No. 1" and "Isolation Bearing, Details No. 2".

#### **Protective Environmental Seal**

The sliding element shall be protected from exposure to conditions which may affect the friction coefficient of the sliding element.

The space around the bearing surfaces shall be sealed with an ethylene propylene material to prevent dust and moisture from entering the bearing interior as recommended by the manufacturer.

The seal shall be able to accommodate the maximum non-seismic lateral displacement or the maximum thermal displacement, whichever is greater, as shown on the plans without cracking.

#### **Interior Bearing Surfaces**

The mating surfaces on the spherical concave surface opposing the articulated slider shall be stainless steel conforming to the requirements in ASTM Designation A240, Type 316.

The bearing liner shall be as manufactured for the approved prototype bearings. The bearing liner shall be bonded to the steel surfaces so that full bonding is retained throughout the proof testing.

The bearing-liner-to-stainless-steel interface shall be in contact when loaded in any position.

The Contractor shall repair or replace any bearings that are damaged during fabrication, testing, shipping and storage, or installation at the Contractor's expense. Damaged bearings and bearings with mating surface scratches exceeding 0.01 inch shall be returned to the factory for replacement or resurfacing.

#### **Structural Steel**

The stainless steel overlay welds and cover plate welds are considered non-structural, and shall conform to EPS's standard welding procedures.

Steel plates, except stainless steel, shall conform to the requirements of ASTM Designation A 572.

Cast structural steel components for the concave plates and housing plates shall be in conformance with the requirements in ASTM Designation A536. The minimum ultimate capacity shall be 60 ksi. The minimum yield capacity shall be 40 ksi. The minimum elongation shall be 12 percent.

Internally threaded parts in concave plate and upper housing which receive galvanized cap screws for anchorage to the bottom flange of the existing bridge shall conform to the requirements for thread dimensions and overtapping allowances in ASTM Designation: A 563.

Tapping of nuts or other internally threaded parts to be used with zinc coated bolts, anchor bars or studs shall be done after galvanizing and shall conform to the requirements for thread dimensions and overtapping allowances in ASTM Designation: A 563.

#### **Cleaning and Painting Steel**

Bearings shall be cleaned and painted in accordance with the provisions in "Clean and Paint Seismic Isolation Bearing" of these special provisions.

### **Bearing Liner**

The bearing liners shall consist of a self-lubricating bearing liner bonded to the articulated slider. The bearing liners shall have dynamic and wear characteristics capable of meeting the specified bearing performance as verified by proof testing. The minimum thickness of the bearing liner shall be 0.06 inch.

### **PROOF TESTING**

Quality control proof testing shall be performed on all bearings in the presence of the Engineer, to be conducted at EPS facilities. In addition, the Engineer will select individual bearings for quality assurance proof testing at the Caltrans SRMD Test Facility.

Two Type I bearings and six Type II bearings shall be shipped to the Caltrans SRMD Test Facility, Building No. 700, Lyman Lane, La Jolla, CA 92037, contact Danny Innamorato at 858-822-4928. After quality assurance testing, all bearings shall be shipped to the EPS facility for final assembly.

The cost of shipping of bearings to and from, and testing of bearings at the Caltrans SRMD facility will be borne by the Contractor.

The Contractor shall notify the Caltrans SRMD facility and Engineer, in writing, at least 60 days prior to each shipment of bearings for testing.

The Contractor shall coordinate with the Caltrans SRMD facility for the design and manufacturing of the adapter plates to be used to attach the bearings to the test apparatus. After testing, all adapter plates will become the property of the State.

Proof test specimens of the bearing systems shall be conditioned for 12 hours at  $65^{\circ}\pm 15^{\circ}\text{F}$  prior to testing, and the ambient temperature shall be maintained at  $65^{\circ}\pm 15^{\circ}\text{F}$  during testing.

All proof tests shall be performed using continuous harmonic or sinusoidal input.

The proof test consists of 3 fully reversed cycles of loading at 1.0 times the maximum seismic longitudinal displacement shown on the plans for each type of bearing. The compressive load for the test shall be 1.0 time the vertical dead load. The period range shall be 46 to 92 seconds per cycle for the Type I bearing and 40 to 80 seconds per cycle for the Type II bearing.

Bearings shall meet the following acceptance criteria:

- 1) The average effective stiffness ( $K_{\text{eff}}$ ) from all three cycles of each individual bearing shall be within  $\pm 20$  percent of the value shown on the plans. The average EDC for all three cycles of each individual bearing shall not be less than -25 percent of the value of EDC shown on the plans.
- 2) The bearings shall remain stable and show no signs of permanent structural deformation during the proof tests. If the bearing shows any permanent structural deformation greater than 0.02 inch, splits, fractures, or other unspecified structural damage at any loading condition, the bearing shall be rejected.

Rejected bearings shall be replaced at the Contractor's expense.

The bearings shall satisfy all aspects of the proof tests.

### **Test Submittals**

After completion of the proof test at EPS and at Caltrans SRMD Facility, the Contractor shall submit to the Engineer 8 copies of the complete test results for the bearings tested. Bearing installation shall not proceed until bearings have been successfully tested at EPS and SRMD and test results have been approved by the Engineer. Test results shall list the location of the test, key personnel, test loading equipment, type of bearing, bearing number, date of manufacture, date of test, complete record of load, displacement, hysteretic behavior, and period of load application for each cycle of the test.

In addition to submitting the complete test results, initial test results shall be reported to the Engineer providing the information given on form Initial Test Results for Friction Pendulum Bearings. The manufacturer shall submit to the Engineer 3 copies of the initial test results within 5 working days of completing the proof test for individual bearings.

### **STORAGE AND HANDLING**

The Contractor shall provide an on-site storage facility for the bearings, and shall transport the bearings from the manufacturer's interim storage to the on-site storage facility. The Contractor shall handle and store the bearings in conformance with the requirements outlined by the manufacturer and these special provisions.

## **MEASUREMENT AND PAYMENT**

Furnish seismic isolation bearing will be measured and paid for by the unit as furnish seismic isolation bearing of the types listed in the Engineer's Estimate. The quantity of seismic isolation bearings of the types listed in the Engineer's Estimate will be determined from the actual count of the production bearings that have been successfully proof tested and furnished at the manufacturer's interim storage facility.

The contract unit price paid for furnish seismic isolation bearing of the types listed in the Engineer's Estimate shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals for doing the work involved in furnishing seismic isolation bearings, including redesign, if necessary, fabricating, proof testing, and replacing rejected or damaged components of proof tested bearings, as shown on the plans, as specified in these special provisions, and as directed by the Engineer.

No payment will be made for bearings that fail to meet any of the acceptance criteria.

Full compensation for providing the maintenance manuals, designing and furnishing adapter plates for testing at Caltrans SRMD Facility, and cleaning and painting of the bearings shall be considered as included in the contract unit price paid for furnish seismic isolation bearing of the types listed in the Engineer's Estimate and no separate payment will be made therefor.

Full compensation for inspection and advice by the qualified representative of the bearing manufacturer during testing and installation of the bearings shall be considered as included in the contract unit price paid for furnish seismic isolation bearing of the types listed in the Engineer's Estimate and no separate payment will be made therefor.

Full compensation for transportation and delivery of bearings to and from the SRMD testing facility and to the interim storage facility shall be considered as included in the contract unit price paid for furnish seismic isolation bearing of the types listed in the Engineer's Estimate and no separate payment will be made therefor.

### 10-1.525 CLEAN AND PAINT SEISMIC ISOLATION BEARING

Exposed metal surfaces of the seismic isolation bearing shall be cleaned and painted in conformance with the provisions in Sections 59-2, "Painting Structural Steel," of the Standard Specifications and these special provisions.

#### CLEANING

The surfaces to be cleaned and painted shall be dry blast cleaned in conformance with the requirements of SSPC-SP 10, "Near White Blast Cleaning," of the "SSPC: The Society for Protective Coatings." Blast cleaning shall leave surfaces with a dense, uniform, angular anchor pattern of no less than 1.6 mil nor more than 3.4 mil as measured in conformance with the requirements of ASTM Designation: D4417. Blast cleaning shall not be performed in less than 24 hours after water rinsing nor until the surfaces are thoroughly dry.

Mineral and slag abrasives used for blast cleaning steel surfaces shall conform to the requirements for Class A, Grade 2 to 3 abrasives contained in SSPC-AB 1, "Mineral and Slag Abrasives," of the "SSPC: The Society for Protective Coatings," and shall not contain hazardous material.

The absence of oil contamination in all abrasives shall be confirmed with the water sheen test in accordance with ASTM D 4940. The sample, in water, when tested in accordance with ASTM D 4940, shall show no presence of oil, either on the surface of the water or as an emulsion in the water, when examined visually after standing for 30 minutes.

Steel abrasives used for blast cleaning steel surfaces shall comply with the requirements of SSPC-AB 3, "Ferrous Metallic Abrasive," of the "SSPC: The Society for Protective Coatings." The majority of the abrasive mix shall be steel grit. A portion of the abrasive may be steel shot, provided that no more than 20% of the resulting profile is rounded when viewed under 10X magnification.

Recycling of steel abrasives will be permitted as long as the recycled abrasive conforms to the requirements of SSPC-AB 2, "Specification for Cleanliness of Recycled Ferrous Metallic Abrasive," of the "SSPC: The Society for Protective Coatings." The resulting profile shall be no more than 20% rounded when viewed under 10X magnification.

Fresh, potable water with a maximum chloride content of 0.010 ounce/gal and a maximum sulfate content of 0.027 ounce/gal shall be used for water rinsing or pressure washing operations. No continuous recycling of rinse water will be permitted. If rinse water is collected into a tank and subsequent testing determines the collected water conforms to the specified requirements, reuse may be permitted by the Engineer if no collected water is added to the tank after sample collection for determination of conformance to specified requirements.

A Certificate of Compliance conforming to the provisions in Section 6-1.07, "Certificates of Compliance," of the Standard Specifications and a Material Safety Data Sheet shall be furnished prior to use for each shipment of blast cleaning material.

#### PAINTING

Blast cleaned areas shall be coated with the following 3-coat, moisture-cured polyurethane coating system in the order listed. All coats of the coating system shall be manufactured by the same manufacturer.

1. First undercoat paint shall be a single component, zinc-rich, moisture-cured polyurethane coating conforming to the following requirements:

Property	Value	ASTM Designation
Metallic Zinc In Dry Film	78% min.	D 521
Weight per Gallon	23.4 lb min.	D 1475
Nonvolatile Content	88% min.	D 2369
VOC Content	2.5 lb/gal max.	D 3960
Dry Times Set to Touch	30 minutes max.	D 1640
Dry Hard	6 hours max.	

2. First undercoat shall be applied to a dry film thickness of not less than 3 mils nor more than 4 mils within 4 hours of abrasive blast cleaning.
3. Second undercoat paint shall be a single component, micaceous iron oxide filled, moisture-cured polyurethane coating conforming to the following requirements:

Property	Value	ASTM Designation
Weight per Gallon	13.3-14.2 lb	D 1475
Nonvolatile Content	80% min.	D 2369
VOC Content	2.5 lb/gal max.	D 3960
Dry Times Set to Touch	1 hour max.	D 1640
Dry Hard	8 hours max.	

4. The second undercoat shall be applied to a dry film thickness of not less than 3 mils nor more than 4 mils. A minimum of 20 hours and a maximum of 7 days shall elapse between application of the first and second undercoats. The surface of the first undercoat shall be pressure washed as directed in these specifications if more than 48 hours elapse between application of the first and second undercoat.
5. Finish coat paint shall be a single component, semi-gloss, aliphatic, moisture-cured polyurethane coating conforming to the following requirements:

Property	Value	ASTM Designation
Weight per Gallon	10.0 lb min.	D 1475
Nonvolatile Content	72% min.	D 2369
VOC Content	2.5 lb/gal max.	D 3960
Dry Times Set to Touch	2hours max.	D 1640
Dry Hard	16 hours max.	

6. Finish coat color shall match Federal 595B No. 26408.
7. The finish coat shall be applied to a dry film thickness of not less than 2 mils nor more than 3 mils. A minimum of 20 hours and a maximum of 7 days shall elapse between application of the second undercoat and the finish coat. The surface of the undercoat shall be pressure washed as directed in these specifications if more than 48 hours elapse between application of the second undercoat and the finish coat.

The following environmental conditions shall apply to application of moisture-cured polyurethane coatings:

Environmental Parameter	Requirement
Application Relative Humidity	35 to 85%
Substrate & Ambient Temperature	5 degrees F above the dew point
Air and Substrate Temperature for Application and Curing (Film is curing until it has reached a dry hard condition as defined in ASTM D1640)	39 to 100 degrees F

The Contractor shall be aware that moisture cured polyurethane coatings can entrap bubbles generated during curing within the film when applied at excessive film thickness. Any such bubbling is unacceptable and shall be cause for rejection. Such damaged film shall be either removed and replaced or repaired, at the Contractor's expense, to the satisfaction of the Engineer at his discretion.

Thinning will be permitted in accordance with manufacturer's recommendations to facilitate paint application. Full compensation for cleaning and painting of seismic isolation bearings shall be considered as included in the contract unit price paid for furnish seismic isolation bearing of the types listed in the Engineer's Estimate, and no separate payment will be made therefor.

## **10-3.11 SEISMIC MONITORING ELECTRICAL SYSTEM**

### **GENERAL**

#### **Summary**

This work shall consist of installing the seismic monitoring electrical system in accordance with the details shown on the plans, the Standard Specifications, and these special provisions.

Electrical work shall include furnishing all labor, materials, equipment and services required to construct and install the complete seismic monitoring electrical system as shown on the plans.

Attention is directed to "Install Seismic Monitoring Casing," of these special provisions.

System layouts are generally diagrammatic and location of equipment is approximate. Exact routing of conduits and other facilities and location of equipment is to be governed by structural conditions and other obstructions, and shall be coordinated with the work of other trades. Equipment requiring maintenance and inspection shall be located where it is readily accessible for the performance of such maintenance and inspection.

#### **Related Work**

Earthwork, foundations, sheet metal, painting and such other work incidental to and necessary for the proper installation and operation of the seismic monitoring electrical system shall be done in accordance with the requirements specified for similar work elsewhere in these special provisions.

#### **Order of Work**

The time to start the electrical work shall be coordinated with the schedule of bridge retrofit work and as directed by the Engineer.

### **STATE-FURNISHED MATERIALS**

Attention is directed to "State-Furnished Materials" of these special provisions.

The following seismic sensor accessories shall be installed by the Contractor and will be furnished by the State as provided under "Materials" of these special provisions:

- Force Balance Accelerometer (FBA) pigtails
- Seismic sensor mounting plates
- "Bishops Hat" Downhole Specially formed sealed cap

The Contractor shall notify the Engineer in writing not less than 30 days in advance when the Contractor wants CGS personnel to deliver the State-furnished material to the Contractor. CGS personnel will demonstrate the State-furnished material installation to the personnel that will be completing the installation.

#### **State-Furnished and installed material**

The Contractor shall notify the Engineer in writing at least 30 days in advance when the Contractor want CGS personnel to install and test their equipment as specified elsewhere in these special provisions. The following seismic monitoring system materials will be furnished and installed by the State:

- Downhole seismic sensors complete with cable to surface
- Seismic sensors
- Seismic recorders
- Displacement sensors
- GPS Antenna

The Contractor shall also notify the Engineer in writing not less than 30 days in advance when the Contractor wants CGS personnel to mark the exact location for each seismic sensor enclosure on the structural elements across the bridge and six downhole seismic sensors between Pier 35 and Pier 36.

## **Access and Contractor Assistance**

The Contractor shall participate in a pre-job meeting at site with California Geological Survey (CGS) Personnel before turning off existing seismic monitoring equipment. The Contractor shall notify the Engineer in writing at least 30 days in advance of when the Contractor wants CGS to remove existing seismic sensor enclosures from the bridge. The Contractor shall remove existing seismic sensor cabling, conduits and junction boxes from bridge as shown in the plans and specified in these special provisions. The Contractor shall provide CGS personnel access and equipment to safely accomplish their work.

After flexible conduits have been installed and before installing seismic sensor cables, the Contractor shall notify the Engineer in writing at least 30 days in advance when the Contractor wants CGS to inspect the flexible conduits installed to allow for bridge structure movement as shown on the plans. CGS shall approve the flexible conduits installation before the Contractor install seismic sensor cables.

After all Contractor supplied equipment, conduit and cable has been installed, the Contractor shall provide CGS personnel, total of four personnel each day as described below, the means and equipment to safely access and perform work at all recorder, sensor, and antenna locations. This is to include the transportation of equipment at the job site, traffic control, and movement of stored materials of parked vehicles where necessary. Access is for the purpose of installation, operational testing, and performing necessary system troubleshooting and repair. The estimates below are for actual work at the locations and exclude transit time to the work locations and the set-up times of any lifts, scaffolds, etc. Some of the work can be accomplished simultaneously and CGS personnel will meet with the Engineer and the Contractor at the job site to work out a detailed, mutually agreeable schedule including equipment and workplace access requirement.

### **1. Seismic recorder locations (3 total):**

1.1 CGS personnel will need approximately 3 working days access at each recorder location prior to their installation for the purpose of measuring and preparing to mount the recorders into the cabinets.

1.2 CGS personnel will need approximately 3 working days access to each recorder location to install and wire the recorders.

1.3 CGS personnel will need approximately 3 working days access to each recorder location during the installation and testing of the seismic sensors wired to that specific recorder location.

1.4 CGS personnel will need approximately 3 working days access to each recorder location during the final system testing and any necessary troubleshooting and repair.

2. At normal seismic sensor enclosure locations CGS personnel will need approximately 60 minutes access time at each enclosure on a minimum of two occasions (installation and testing) to accomplish their work.

3. At downhole seismic sensor locations CGS personnel will need approximately 1 working day access time for each downhole and free field location plus two additional days for wiring and testing.

4. At antenna locations CGS personnel will need approximately 1 working day access time to install and wire radio antenna and antenna cable.

The Contractor shall provide 120 V(ac), single phase, 60 Hz power for each location for the duration of the installation.

## **QUALITY ASSURANCE**

### **Codes and Standards**

All work performed and materials installed shall be in accordance with the National Electrical Code; "California Electrical Code;" the California Code of Regulations, Title 8, Chapter 4, "Electrical Safety Orders;" and all local ordinances.

### **Warranties and Guarantees**

Manufacturer's warranties and guarantees for materials or equipment used in the work shall be delivered to the Engineer at the job site prior to acceptance of the contract.

## **TESTING**

After the complete installation of the seismic monitoring electrical system by both the Contractor and California Geological Survey (CGS) personnel, the complete system will be tested by CGS personnel in the presence of the Contractor and the Engineer to demonstrate that the system is working properly. Any problems associated with the equipment installed by the Contractor (State or Contractor supplied) shall be adjusted, replaced, or repaired as required at the Contractor's expense, and the complete system shall be retested. If problems occur with the state installed equipment, it will be replaced or repaired as required, and retested all at the state's expense.

The Contractor shall provide 120 V(ac), single phase, 60 Hz power for each location for the duration of the testing. ISDN telephone service at the recorder locations must be operational before final testing can be completed.

## **SUBMITTALS**

### **Product data**

A list of materials and equipment to be installed, manufacturer's descriptive data, and such other data as may be requested by the Engineer shall be submitted for approval.

Manufacturer's descriptive data shall include complete description, performance data and installation instructions for the materials and equipment specified herein. Control and wiring diagrams, rough-in dimensions for junction and pull boxes, and component layout shall be included where applicable. All cables and power conductors on the shop drawings shall be identified with cable and conductor numbers.

Manufacturer's descriptive data shall be submitted for the following:

- Seismic sensor cable
- Telephone (ISDN) cable
- Interconnect cable
- Junction boxes (Cast and NEMA Type 4X SST)
- Seismic sensor enclosures (Cast and NEMA Type 4X SST)
- Pull boxes
- Receptacles
- Circuit breakers
- Seismic recorder cabinets
- Type S cabinet and foundation
- Seismic recorder power enclosure

The submittals shall be delivered to the Office of Structures Design, Documents Unit, Fourth Floor, 1801 30th Street, Sacramento, or mailed to the Office of Structures Design, Documents Unit, P.O. Box 942874, Mail Station #9-4/4 I, Sacramento, California 94274-0001.

Each submission of drawings, material lists and descriptive data shall consist of at least five copies. Two copies will be returned to the Contractor either approved for use or returned for correction and resubmitted.

Each separate item submitted shall bear a descriptive title, the name of the project, district, county, and contract number.

The material list shall be complete as to name of manufacturer, catalog number, size, capacity, finish, all pertinent ratings, and identification symbols used on the plans and in the special provisions for each unit.

## **CONDUITS AND FITTINGS**

### **Conduit, General**

Conduit shall conform to section 86-2.05 "Conduit" of the Standard Specifications and as specified in these special provisions.

**Rigid steel conduit and fittings:** Rigid steel conduit and fittings shall be Type 1 in conformance with the provisions in Section 86-2.05A, Subparagraph A, "Material," of the Standard Specifications.

**PVC Coated Rigid Steel Conduit and Fittings:** PVC coated rigid steel conduit and fittings shall be Type 2 in conformance with the provisions in Section 86-2.05A, Subparagraph B, "Material," of the Standard Specifications.

**Liquidtight Flexible Metallic Conduit and Fittings:** Liquidtight flexible metallic conduit and fittings shall be Type 4 in conformance with the provisions in Section 86-2.05A, Subparagraph D, "Material," of the Standard Specifications.

### **Conduit Installation**

All conduits installed underground and at all pier and pile cap locations shall be PVC coated rigid galvanized steel conduits installed to manufacturer's specifications unless otherwise shown. This conduit shall be installed with "clamp backs" to space conduit off the concrete.

All conduits shall be rigid steel conduit unless otherwise shown on the plans or specified in these special provisions.

Liquidtight flexible metallic conduit shall be installed at locations as shown on the plans.

All conduit along bridge catwalk shall be supported with SST construction channel secured to the bridge catwalk guard rail clamps. Conduits shall be fastened to construction channel with channel compatible pipe clamps.

Conduit trade sizes are shown on the plans. No deviation from the conduit size shown on the plans will be permitted without written permission from the Engineer.

Conduits shall be tightly covered and well protected during construction using metallic bushings and bushing "pennies" to seal open ends.

A pull rope shall be installed in all empty conduits. At least three feet of pull rope shall be doubled back into the conduit at each termination.

Locations of conduit runs shall be planned in advance of the installation and coordinated with the structural work in the same areas and shall not unnecessarily cross other conduits or pipe, nor block access to areas of the bridge or abutment buildings.

All conduit installations across regions of movement (hinges, isolator bearings, and abutments) shall be liquidtight flexible metallic conduit with slack as indicated and as shown on the plans to accommodate for movement.

Where practical, conduits shall be installed in groups in parallel, vertical or horizontal runs and at elevations that avoid unnecessary offsets.

Exposed conduit shall be installed parallel and at right angles to the bridge lines.

All raceway systems shall be secured to the building structures using specified fasteners, clamps and hangers.

All metal conduits, metal conduit risers, and metal conduit elbows in contact with soil or concrete shall be PVC coated rigid steel conduit.

Single PVC coated rigid steel conduit runs shall be supported by using PVC coated rigid steel one hole pipe clamps. Where run horizontally on walls in damp or wet locations or on the barrier rail, conduit shall be installed with PVC coated rigid steel "clamp backs" to space conduit off the surface.

Single rigid steel conduit runs shall be supported by using one hole pipe clamps. Where run horizontally on walls in damp or wet locations or on the barrier rail, conduit shall be installed with "clamp backs" to space conduit off the surface.

Multiple PVC coated rigid steel conduit runs shall be supported with PVC coated rigid steel construction channel secured to the building or bridge structure. Conduits shall be fastened to construction channel with PVC coated rigid steel channel compatible pipe clamps.

Multiple rigid steel conduit runs shall be supported with construction channel secured to the building or bridge structure. Conduits shall be fastened to construction channel with channel compatible pipe clamps.

Raceways of different types shall be joined using approved couplings or transition fittings.

### **Conduit Terminations**

PVC coated rigid steel conduits shall be securely fastened to cabinets and boxes, using approved PVC coated rigid steel weatherproof fittings. Conduit terminations at exposed weatherproof enclosures and cast metal boxes shall be made watertight using weatherproof hubs.

Rigid steel conduits shall be securely fastened to cabinets, boxes, and gutters using two locknuts and insulating metallic bushing connectors. Conduit terminations at exposed weatherproof enclosures and cast metal boxes shall be made watertight using weatherproof hubs.

All future conduits terminated in underground pull boxes or exposed indoor and outdoor shall be provided with watertight conduit plugs.

Conduits entering seismic sensor enclosures shall be either from top or side. Conduit shall not enter from the back side of the seismic sensor enclosure.

Grounding bushings with bonding jumpers shall be installed on all type of conduits terminating at concentric knockouts and on all conduits containing power conductors, and grounding electrode conductor.

## **CABLES AND CONDUCTORS**

### **Seismic Sensor Cable**

Seismic sensor cable, SSC, shall be four (4) twisted pairs stranded tinned copper conductors, AWG #22 (7 x 30 stranded), insulation 0.007 inch thick, individually shielded pairs with an aluminum-polyester shield and a AWG #22 stranded tinned copper drain wire for each pair, overall nominal outside diameter of 0.30 inch or less and outer jacket 0.009 inch thick. Cable shall be instrument cable, NEC rated CLP2 plenum cable rated for 150 °C. Cable shall be similar to Belden plenum cable, Catalog No. 87778 except with only four pairs and having a color code as specified below:

Color Code:      1st pair - red, black;  
                         2nd pair - white, brown;  
                         3rd pair - blue, violet;  
                         4th pair - yellow, orange

Seismic sensor cable shall be General Wire and Cable Co., Inc.; Consolidated Wire and Cable; or equal.

Cable spools shall be of sufficient length to allow cables to be installed without splices from the seismic sensor enclosures to the recorder locations as shown on the plans. Only by permission from the Engineer will splices in these continuous runs be allowed.

### **Seismic Sensor Cable Identification**

Each seismic sensor cable shall be tagged with the seismic sensor cable number as shown in the Seismic Sensor Enclosure Identification Table on the plans at each termination. Additionally, at each junction box, pull box, and recorder cabinet location, the cables shall be identified. Identification shall be made with one of the methods specified under "Conductor Identification," below.

### **Telephone Cable**

Telephone cable shall be waterproof filled-sheath, Integrated Signal Digital Network (ISDN) rated cable with six twisted pairs, individually shielded stranded conductor, minimum AWG #22 tinned copper, polyethylene insulated, with a foil aluminum-polyester shield, drain wire and chrome PVC jacket rated for 300 V and underground installation. Cable spools shall be of sufficient length to allow the cables to be installed without splices from AT&T service point to the three seismic recorders. Only by permission from the Engineer will splices in these continuous runs be allowed. Any splices that are allowed by the Engineer shall be made by a cable installer certified to install ISDN splices.

Color code for ISDN telephone cable shall be as follows:

1. White/Blue
2. White/Orange
3. White/Green
4. White/Brown
5. White/Gray
6. Red/Blue

The core shall be protected by a non-hygroscopic polyester film with a single longitudinally applied corrugated copper shield (or plastic coated aluminum shield). A moisture barrier of petrolatum-polyethylene compound shall be applied over the core tape and over and under the cable shield to fill all cable interstices.

The cable shall be provided with an outer jacket of extruded, black, high molecular weight, heat stabilized polyethylene material. The outer diameter of the cable shall be 1/2" maximum.

### **Interconnect Cable**

Interconnect cable, IC, shall be EIA RS-485 applications cable, plenum type, NEC rated CL2P for temperature of 150°C. Cable shall be similar to Belden cable No. 9844 but plenum rated. The cable shall have eight tinned copper, insulated conductors (4 twisted pairs) with color code as specified below. Overall aluminum-polyester shield and AWG #24 stranded tinned copper drained wire. Overall tinned copper braid shield (90 percent coverage). Overall nominal outside diameter of 0.35 inch or less, with outer jacket of 0.009 inch thick.

Color Code:      1st pair - White/Blue stripe, Blue/White stripe;  
                         2nd pair - White/Orange stripe, Orange/White stripe;  
                         3rd pair - White/Green stripe, Green/White stripe;  
                         4th pair - White/Brown stripe, Brown/White stripe

Interconnect cable shall be General Wire and Cable Co., Inc.; Consolidated Wire and Cable; or equal. Cable spools shall be of sufficient length to allow cables to be installed without splices.

### **Conductors**

Conductors shall be stranded copper wire. Conductors shall be type XHHW-2 at all locations.

### **Wire connection and devices**

Wire connections and devices shall be pressure or compression type, except that connectors for No. 10 AWG and smaller conductors in dry locations may be preinsulated spring-pressure type.

## Conductor and cable installation

Conductors shall not be installed in conduit until all work of any nature that may cause injury is completed. Care shall be taken in pulling conductors that insulation is not damaged. An approved non-petroleum base and insulating type pulling compound shall be used as needed.

Seismic cables shall be tested in accordance with manufacturer's recommendations.

Splices and joints shall be insulated with insulation equivalent to that of the conductor.

Provide six inches of slack at each outlet and device connection. If the outlet or device is not at the end of a run of wire, connection shall be made with correctly colored pigtailed taps to the runs with splices as specified herein.

All pressure type connectors and lugs shall be retightened after the initial set.

## Conductor Identification

The neutral and equipment grounding conductors shall be identified as follows:

1. Neutral conductor shall have a white or natural gray insulation except that conductors No. 4 and larger may be identified by distinctive white markers such as paint or white tape at each termination.
2. Equipment grounding conductor may be bare or insulated. Insulated equipment grounding conductors shall be green or green with one or more yellow stripes over its entire length. Conductors No. 4 and larger may be permanently identified by distinctive green markers such as paint or green tape at all accessible locations over the entire exposed conductor.

Ungrounded branch circuit conductors shall be color coded by continuously colored insulation, except conductors No. 6 AWG or larger may be color coded by colored tape at each connection and where accessible. Ungrounded conductor color coding shall be as follows:

SYSTEM	COLOR CODE
120/240 V-Single phase	Black, blue
480 V-Three phase	Brown, purple, yellow

Once grounded and ungrounded insulated conductors are identified with a specific color code, that color code shall be used for the entire length of the circuit.

All control conductors including control conductors of manufacturer supplied and field wired control devices shall be identified at each termination with the conductor numbers shown on the plans, working drawings, and as directed by the Engineer where deemed necessary. Identification shall be made with one of the following:

1. Adhesive backed paper or cloth wrap-around markers with clear, heat shrinkable tubing sealed over either type of marker.
2. Pre-printed, white, heat-shrinkable tubing.

## ELECTRICAL BOXES

### Seismic Junction Boxes

Unless otherwise shown or specified, all seismic junction boxes shall be NEMA Type 4X SST junction boxes. Seismic cast junction boxes shall be installed at all pile cap locations and other locations shown on the plans. All junction boxes shall be installed at locations as shown on the plans or as specified in these special provisions. Adjustments to locations may be made as required by structural conditions and to suit coordination requirements of other trades.

### Seismic Cast Metal Junction Box

Cast metal junction box shall be a cast ferrous metal, NEMA Type 6, gasketed screw cover box complete with external mounting lugs, weatherproof conduit hubs and size as shown on the plans. The cover shall have the inscription "SEISMIC JUNCTION BOX" in 1" high letters.

### Seismic NEMA Type 4X SST Junction Box

Seismic NEMA Type 4X SST junction box shall be a 316 or 316L stainless steel, NEMA Type 4X, hinged, gasketed cover box with weatherproof conduit hubs and size as shown on the plans. A nameplate with the inscription "SEISMIC JUNCTION BOX" in 1" high letters shall be installed on the front cover.

### **Power Junction Boxes**

Power Junction boxes shall be a 316 or 316L stainless steel, NEMA Type 4X, hinged, gasketed cover box with weatherproof conduit hubs and size as shown on the plans. A nameplate with the inscription "POWER JUNCTION BOX" in 1" high letters shall be installed on the front cover.

### **Seismic Sensor Enclosures (Mounting Type 1 thru 6)**

All seismic sensor enclosures, except sensor enclosure mounting type 7, shall be stainless steel NEMA Type 4X 316 or 316L type boxes with a continuous hinged cover. All seismic sensor enclosures shall have dimensions as shown on the plans. The enclosure shall include vents as shown on the plans. A ground stud (#1/4-20) shall be installed on one inside corner of the cover. A nameplate with the inscription "SEISMIC ENCLOSURE #" in 1" high letters shall be installed on the front cover (the # shall correspond to the enclosure number shown on the plans).

The back side of the enclosure shall be a flush and smooth surface. Seismic sensor enclosure with continuous hinged cover shall be Hoffman, catalog #A-1412CHNFSS6; Circle AW, catalog #14126-4XSS6CHC; or equal. Seismic sensor enclosures shall be without upper and lower mounting flanges and with padlock hasp similar to catalog #A-PLKJIC.

### **Seismic Sensor Enclosure (Mounting Type 7)**

Seismic sensor enclosure (mounting Type 7) shall be a cast ferrous metal NEMA Type 6, box with gasketed screw cover box, 6 inches deep and of dimensions shown on the plans. Seismic sensor enclosure cover shall have raised cast inscription "SEISMIC ENCLOSURE #" in 1 inch high letters (the # shall correspond to the # of the enclosure shown on the plans).

The box shall be able to withstand submersion in water up to 6 foot depth for extended periods. A minimum of two cast mounting lugs shall be attached on two opposing sides of the enclosure. The enclosure shall have a bossed, drilled and tapped (NPT) hole to accept a 1 inch conduit connector, centered between the mounting lugs on one side only. The enclosure shall also have a mounting button drilled and tapped for 1/4" x 20" located in the center ( $\pm 1/8"$ ) of the inside bottom of the enclosure.

All seismic sensor enclosures, except sensor enclosure mounting type 7, shall be stainless steel NEMA Type 4X 316 or 316L type boxes with a continuous hinged cover. All seismic sensor enclosures shall have dimensions as shown on the plans. The enclosure shall include vents as shown on the plans. A ground stud (#1/4-20) shall be installed on one inside corner of the cover. A nameplate with the inscription "SEISMIC ENCLOSURE #" in 1" high letters shall be installed on the front cover (the # shall correspond to the enclosure number shown on the plans).

### **Seismic Recorder Cabinet**

Seismic recorder cabinet shall be Type S cabinet per Standard Plan ES-3A, and shall be fabricated from aluminum or stainless steel in conformance with the provisions in Section 86-3.04A, "Cabinet Construction," of the Standard Specifications. Dimension of the enclosure shall be suitable for the equipment to be installed as shown on the plans and as specified in these special provisions. The cabinet shall not include shelving, police panel, cabinet cage, electric fan and thermostat.

### **Telephone Demarcation Cabinet (TDC)**

The Contractor shall furnish and install all cable assemblies, punch block, and connecting blocks inside the TDC, except those that are provided by the telephone company, as shown on the plans and as directed by the Engineer.

1. Ground rod shall meet the requirements of NEC Article 250-84.
2. Padlock able drawer latch shall be padlock hasp.
3. Backboard C shall be secured by a retaining screw.
4. Duplex outlet and GFCI duplex outlet shall be separately connected to one of the 20-ampere, single pole branch circuit breaker.
5. The bottom plate for TDC shall be 1/8" aluminum.

### **Downhole Box**

Downhole box shall be No. 5 pull box and shall be fabricated from high density reinforced concrete. The box shall be designed for installation in heavy truck traffic areas.

### **Downhole Box Installation**

The top of the downhole box shall be 1/2" above the finished grade in unpaved areas and flush with grade in paved area. The bottom of pull boxes shall be bedded in 6" of clean, crushed rock or gravel and shall be grouted with 1.6" thick grout prior to installation of conductors. Grout shall be sloped to a 1" diameter PVC pipe drain hole. Conduit shall be sealed in place with grout. Where conduits enter the downhole, the space around the conduits shall be grouted tightly or cast thru the bottom.

### **MISCELLANEOUS MATERIALS**

#### **Duplex Receptacle**

Duplex receptacle shall be NEMA Type 5-20R, 3-wire, 20-ampere, 125-volt, ivory color, specification grade duplex receptacle suitable for wiring with stranded conductors. Duplex receptacle outlets shall be mounted on the back panel of seismic recorder cabinet as shown on the plans.

#### **Circuit Breaker**

Circuit breakers shall be single pole, 120 V(ac), 20-A trip, molded case circuit breakers. Spare circuit breakers shall have an interrupting capacity of 10,000 A (symmetrical) at 120 V(ac).

#### **Neutral Bar, NB**

Neutral bars shall be 100-A copper neutral bars with circuit taps.

#### **Ground Bar, GB**

Ground bars shall be 100-A copper ground bars with circuit taps.

#### **Transformer**

Transformers shall be double-wound, 60 Hz, dry type transformers with a 480 V(ac) primary, 120 V(ac) secondary and sized as shown on the plans.

#### **Pull Ropes**

Pull ropes shall be nylon or polypropylene with a minimum tensile strength of 500 pounds.

#### **Watertight Conduit Plugs**

Watertight conduit plugs shall be a hollow or solid stem expansion plugs complete with inner and outer white polypropylene compression plates and red thermoplastic rubber seal. Seal material shall be non-stick type rubber resistant to oils, salt, and alkaline substances normally present at construction site.

#### **Anchorage Devices**

Anchorage devices shall be corrosion resistant stainless steel bolts, machine screws, studs, expansion shields, and expansion anchors and inserts.

#### **Anchorage**

Hangers, brackets, conduit straps, supports, and electrical equipment shall be rigidly and securely fastened to surfaces by means of expansion shields and machine screws, or expansion anchors and studs or standard preset inserts on concrete or solid masonry, and machine screws or bolts on metal surfaces.

Anchorage devices shall be installed in accordance with the anchorage manufacturer's recommendations.

#### **Electrical Supporting Devices**

Electrical supporting devices shall be one-hole stainless steel conduit clamps with clamp backs. Beam clamps supporting conduit in box girders shall be stainless steel.

Electrical supporting devices for galvanized conduit shall be stainless steel two-hole conduit clamp.

Electrical supporting devices for PVC coated conduit shall be PVC coated two-hole conduit clamp.

Construction channel shall be 1-1/2"x1-1/2" (12-gage) stainless steel channel with 0.5" diameter bolt holes, 1.5" on center in the base of the channel.

**Warning Tape**

Warning tape shall be 4 inches wide and contain the printed warning "CAUTION ELECTRICAL CONDUIT" in bold 3/4-inch black letters at 30-inch intervals on bright orange or yellow background. The printed warning shall be non-erasable when submerged under water and resistant to insects, acids, alkali, and other corrosive elements in the soil. The tape shall have a tensile strength of not less than 155 pounds per 4-inch wide strip and shall have a minimum elongation of 700 percent before breaking.

**Nameplates**

Nameplates shall be laminated phenolic plastic with white core and black front and back. Nameplate inscription shall be in capital letters etched through the outer layer of the nameplate material.

**Equipment Identification**

Equipment shall be identified with nameplates fastened with self-tapping, stainless steel screws. Nameplate inscriptions shall be as specified elsewhere in the special provisions.

**MEASUREMENT**

Seismic monitoring electrical system shall be paid for on the basis of a lump sum price.

### **10-3.12 PAYMENT**

The contract lump sum price paid for modify electrical system shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in modify electrical system, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

The contract lump sum price paid for seismic monitoring electrical system shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in strong motion detection system, including earthwork and foundations, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Full compensation for strong motion detection system platform, including cleaning and painting, shall be considered as included in the contract lump sum price paid for seismic monitoring electrical system and no separate payment will be made therefor.

If any of the fabrication sites for the materials listed are located more than 300 air line miles 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 300 air line miles from both Sacramento and Los Angeles will be reduced \$2,000:

1. Service equipment enclosures
2. Telephone demarcation cabinets

**Bidder Name:** \_\_\_\_\_

The bidder must identify each subcontractor performing work in an amount in excess of 1/2 of 1 percent of the total bid or \$10,000, whichever is greater (Pub Cont Code § 4100 et seq.). Complete columns 1 and 4 and submit with the bid. Complete columns 2 and 3 and submit with the bid or fax to (916) 227-6282 within 24 hours after the bid opening. Failure to provide complete information in columns 1 through 4 within the time specified will result in a non-responsive bid.

<b>Column 1:</b> Business Name and Location	<b>Column 2:</b> Bid Item No.(s)	<b>Column 3:</b> Percent of Bid Item Subcontracted	<b>Column 4:</b> Description of Subcontracted Work

**ADA Notice** For individuals with sensory disabilities, this document is available in alternate formats. For information call (916) 654-6410 or TDD (916) 654-3880 or write Records and Forms Management, 1120 N Street, MS-89, Sacramento, CA 95814.

**BID ITEM LIST**  
**04-1A5214**

Item No.	Item Code	Item Description	Unit of Measure	Estimated Quantity	Unit Price	Item Total
61 (F)	750501	MISCELLANEOUS METAL (BRIDGE)	LB	10,700		
62	800007	FENCE (TYPE BW, 5 STRAND, METAL POST)	LF	970		
63	017860	12' CHAIN LINK GATE (TYPE CL-6, EXTENSION ARM)	EA	1		
64	802900	CHAIN LINK FENCE (TYPE CL-8, EXTENSION ARM)	LF	48		
65	802902	4' CHAIN LINK GATE (TYPE CL-8, EXTENSION ARM)	EA	2		
66	833079	INSTALL CONCRETE BARRIER (TYPE K)	LF	1,890		
67	839481	CONCRETE BARRIER (TYPE 50)	LF	400		
68	840504	4" THERMOPLASTIC TRAFFIC STRIPE	LF	800		
69	850111	PAVEMENT MARKER (RETROREFLECTIVE)	EA	20		
70	860090	MAINTAINING EXISTING TRAFFIC MANAGEMENT SYSTEM ELEMENTS DURING CONSTRUCTION	LS	LUMP SUM	LUMP SUM	
71	BLANK	BLANK				
72	017862	MODIFY ELECTRICAL SYSTEM	LS	LUMP SUM	LUMP SUM	
73	017863	GALVANIZED STEEL PIPE CONDUIT	LF	210		
74	BLANK	BLANK				
75	018541	TURBIDITY CONTROL	LS	LUMP SUM		
76	018542	SEISMIC MONITORING ELECTRICAL SYSTEM	LS	LUMP SUM		
77	999990	MOBILIZATION	LS	LUMPSUM		

