**** WARNING ** WARNING ** WARNING ** WARNING ****
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Note: Addenda information is NOT included with the electronic documents available via electronic file transfer. Only bidder or non-bidder package holders listed with the Caltrans Plans and Bid Documents section as described above will receive addenda information.

Seismic Retrofit Project

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

NOTICE TO CONTRACTORS

AND

SPECIAL PROVISIONS

FOR CONSTRUCTION ON STATE HIGHWAY IN

THE CITY AND COUNTY OF SAN FRANCISCO AT SAN FRANCISCO-OAKLAND BAY BRIDGE FROM 0.2 MILE WEST OF SAN FRANCISCO ANCHORAGE TO EAST END OF YERBA BUENA TUNNEL

DISTRICT 04, ROUTE 80

For use in Connection with Standard Specifications **DATED JULY, 1992**, Standard Plans **DATED JULY, 1992**, and Labor Surcharge And Equipment Rental Rates.

CONTRACT NO. 04-0435U4

INFORMAL BIDS CONTRACT

04-SF-80-5.5/7.8

Bids Open: August 10, 1999

Dated: April 19, 1999

OSD

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IMPORTANT SPECIAL NOTICES

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PRE-AWARD MEETING SPECIAL NOTICE

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The bidder's attention is directed to Section 2-1.07, "Bridge Seismic Retrofit Information/Questionnaire," and Section 3, "Pre-Award Meeting and Award and Execution of Contract," in the Special Provisions.

Responses to the **"Bridge Seismic Retrofit Information/Questionnaire"** included in the Proposal must be **submitted with the bid**

A pre-award **qualifications review meeting** will be conducted with the apparent low bidder on **August 12, 1999 at 10:00 a.m. in the third floor conference room, 1727 - 30th Street, Sacramento, CA 95816.** The purpose of the meeting will be to determine the bidder's qualifications and ability to complete the seismic retrofit work on this project. The second and third apparent low bidders may also be requested to participate in pre-award qualifications review meetings.

Establishing to the satisfaction of the Department the bidder's qualifications and ability to complete the bridge seismic retrofit work in a safe and timely manner is a condition for being eligible for award of the contract.

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DEPARTMENT OF TRANSPORTATION

NOTICE TO CONTRACTORS

THIS IS AN INFORMAL BIDS CONTRACT

CONTRACT NO. 04-0435U4

04-SF-80-5.5/7.8

Sealed proposals for the work shown on the plans entitled:

> **STATE OF CALIFORNIA; DEPARTMENT OF TRANSPORTATION; PROJECT PLANS FOR CONSTRUCTION ON STATE HIGHWAY IN THE CITY AND COUNTY OF SAN FRANCISCO AT SAN FRANCISCO-OAKLAND BAY BRIDGE FROM 0.2 MILE WEST OF SAN FRANCISCO ANCHORAGE TO EAST END OF YERBA BUENA TUNNEL**

will be received at the Department of Transportation, 1120 N Street, Room 0200, MS #26, Sacramento, CA 95814, until 2 o'clock p.m. on August 10, 1999, at which time they will be publicly opened and read in Room 0100 at the same address.

Proposal forms for this work are included in a separate book entitled:

> **STATE OF CALIFORNIA; DEPARTMENT OF TRANSPORTATION; PROPOSAL AND CONTRACT FOR CONSTRUCTION ON STATE HIGHWAY IN THE CITY AND COUNTY OF SAN FRANCISCO AT SAN FRANCISCO-OAKLAND BAY BRIDGE FROM 0.2 MILE WEST OF SAN FRANCISCO ANCHORAGE TO EAST END OF YERBA BUENA TUNNEL**

General work description: Seismic retrofitting of San Francisco Bay Bridge West Span Towers and Superstructure.

This project has a goal of 3 percent disabled veteran business enterprise (DVBE) participation.
No pre-bid meeting is scheduled for this project.
Bidder inquiries may be made as follows:

For structures work: Structures PS&E Duty Senior, Specifications and Estimating Branch, telephone number (916) 227-8770.

For all other inquiries: Toll Bridge Retrofit Program Duty Senior at District 04 Office, 111 Grand Avenue, Oakland, California 94612; Fax Number (510) 286-4563, email Duty Senior Tollbridge District04@dot.ca.gov.

Bidders will be requested to submit their inquiries in writing to the Oakland address, accompanied by an electronic copy where feasible, in order to avoid any misunderstandings. Written inquiries shall include the bidder's name, address and phone number. Written inquiries will be investigated and an addendum to the contract will be issued to the extent feasible and at the discretion of the Department. A copy of each addendum will also be posted on the Internet at "http://tresc.dot.ca.gov/sfobb/CONTRACTORINQUIRIES.html.

The time limit specified for the completion of the work contemplated herein is considered insufficient to permit completion of the work by the Contractor working a normal number of hours per day or week on a single shift basis. Should the Contractor fail to maintain the progress of the work in accordance with the "Progress Schedule (Critical Path)" required in these special provisions, additional shifts will be required to the extent necessary to ensure that the progress conforms to the abovementioned schedule and that the work will be completed within the time limit specified.

Bids are required for the entire work described herein.

At the time this contract is awarded, the Contractor shall possess either a Class A license or a combination of Class C licenses which constitutes a majority of the work.

The Contractor must also be properly licensed at the time the bid is submitted, except that on a joint venture bid a joint venture license may be obtained by a combination of licenses after bid opening but before award in accordance with Business and Professions Code, Section 7029.1.

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

Preference will be granted to bidders properly certified as a "Small Business" as determined by the Department of General Services, Office of Small Business Certification and Resources at the time of bid opening in accordance with the provisions in Section 2-1.04, "Small Business Preference," of the special provisions, and Section 1896 et seq, Title 2, California Code of Regulations. A form for requesting a "Small Business" preference is included with the bid documents. Applications for status as a "Small Business" must be submitted to the Department of General Services, Office of Small Business Certification and Resources, 1531 "I" Street, Second Floor, Sacramento, CA 95814, Telephone No. (916) 322-5060.

A reciprocal preference will be granted to "California company" bidders in accordance with Section 6107 of the Public Contract Code. (See Sections 2 and 3 of the special provisions.) A form for indicating whether bidders are or are not a "California company" is included in the bid documents and is to be filled in and signed by all bidders.

Project plans, special provisions, and proposal forms for bidding this project can only be obtained at the Department of Transportation, Plans and Bid Documents, Room 0200, Transportation Building, 1120 N Street, MS #26, Sacramento, California 95814, FAX No. (916) 654-7028, Telephone No. (916) 654-4490. Use FAX orders to expedite orders for project plans, special provisions and proposal forms. FAX orders must include credit card charge number, card expiration date and authorizing signature. Project plans, special provisions, and proposal forms may be seen at the above Department of Transportation office and at the offices of the District Directors of Transportation at Irvine, Oakland, and the district in which the work is situated. Standard Specifications and Standard Plans are available through the State of California, Department of Transportation, Publications Unit, 1900 Royal Oaks Drive, Sacramento, CA 95815, Telephone No. (916) 445-3520.

Cross sections for this project are not available.

The successful bidder shall furnish a payment bond and a performance bond.

Pursuant to Section 1773 of the Labor Code, the general prevailing wage rates in the county, or counties, in which the work is to be done have been determined by the Director of the California Department of Industrial Relations. These wages are set forth in the General Prevailing Wage Rates for this project, available at the Labor Compliance Office at the offices of the District Director of Transportation for the district in which the work is situated, and available from the California Department of Industrial Relations' Internet Web Site at: http://www.dir.ca.gov. Future effective general prevailing wage rates which have been predetermined and are on file with the Department of Industrial Relations are referenced but not printed in the general prevailing wage rates.

DEPARTMENT OF TRANSPORTATION

Deputy Director Transportation Engineering

Dated April 19, 1999

RRF/CCI

COPY OF ENGINEER'S ESTIMATE

(NOT TO BE USED FOR BIDDING PURPOSES)

04-0435U4

Item	Item Code	Item	Unit of Measure	Estimated Quantity	Unit Price	Item Total
1	015008	ELECTRONIC MOBILE DAILY DIARY COMPUTER SYSTEM DATA DELIVERY	LS	LUMP SUM	LUMP SUM	
2	015009	TIME RELATED OVERHEAD	WDAY	1,250		
3	015010	ESTABLISH MARINE ACCESS	LS	LUMP SUM	LUMP SUM	
4	015011	PHOTO SURVEY OF EXISTING BRIDGE	LS	LUMP SUM	LUMP SUM	
5	070010	PROGRESS SCHEDULE (CRITICAL PATH)	LS	LUMP SUM	LUMP SUM	
6	074019	PREPARE STORM WATER POLLUTION PREVENTION PLAN	LS	LUMP SUM	LUMP SUM	
7	074020	WATER POLLUTION CONTROL	LS	LUMP SUM	LUMP SUM	
8 (S)	120090	CONSTRUCTION AREA SIGNS	LS	LUMP SUM	LUMP SUM	
9 (S)	120100	TRAFFIC CONTROL SYSTEM	LS	LUMP SUM	LUMP SUM	
10 (S)	015012	LOWER DECK, ONE LANE CLOSURE (DAY AND NIGHT)	EA	200		
11 (S)	014972	UPPER DECK, SINGLE LANE CLOSURE (DAY AND NIGHT)	EA	5		
12 (S)	015013	LOWER DECK MULTILANE LANE CLOSURE(NIGHT)	EA	15		
13 (S)	015014	UPPER DECK MULTILANE LANE CLOSURE(NIGHT)	EA	20		
14 (S)	120120	TYPE III BARRICADE	EA	79		
15 (S)	120165	CHANNELIZER (SURFACE MOUNTED)	EA	5		
16 (S)	128650	PORTABLE CHANGEABLE MESSAGE SIGN	EA	22		
17 (S)	129000	TEMPORARY RAILING (TYPE K)	LF	910		
18	157560	BRIDGE REMOVAL (PORTION)	LS	LUMP SUM	LUMP SUM	
19	047501	JACK BRIDGE (LOCATION A)	LS	LUMP SUM	LUMP SUM	
20	047502	JACK BRIDGE (LOCATION B)	LS	LUMP SUM	LUMP SUM	

Item	Item Code	Item	Unit of Measure	Estimated Quantity	Unit Price	Item Total
21	047503	REMOVE RIVET	EA	430,000		
22	047504	MODIFY WATER AND AIR LINE (BRIDGE)	LS	LUMP SUM	LUMP SUM	
23	047505	RETROFIT AND LOWER EXPANSION LOOPS	LS	LUMP SUM	LUMP SUM	
24	047506	REPLACE EXPANSION JOINTS	LS	LUMP SUM	LUMP SUM	
25 (F)	510053	STRUCTURAL CONCRETE, BRIDGE	CY	720		
26	511106	DRILL AND BOND DOWEL	LF	2,960		
27 (S)	047507	CORE CONCRETE AND PRESSURE GROUT	LF	160		
28 (S)	047508	CORE AND BOND DOWEL (EPOXY CARTRIDGE)	EA	890		
29 (S)	047509	VISCOUS DAMPER (TYPE A)	EA	74		
30 (S)	047510	VISCOUS DAMPER (TYPE B)	EA	8		
31 (S)	047511	VISCOUS DAMPER (TYPE C)	EA	18		
32 (S)	518050	PTFE BEARING	EA	2		
33	047622	PTFE SPHERICAL BEARING	EA	2		
34 (S-F)	520102	BAR REINFORCING STEEL (BRIDGE)	LB	83,500		
35 (S-F)	520110	BAR REINFORCING STEEL (EPOXY COATED) (BRIDGE)	LB	41,200		
36 (S)	047512	WIRE CABLE WRAPPING	LF	27		
37 (S)	047513	CABLE BAND	EA	16		
38 (F)	550203	FURNISH STRUCTURAL STEEL (BRIDGE)	LB	17,530,000		
39 (F)	550204	ERECT STRUCTURAL STEEL (BRIDGE)	LB	17,530,000		
40 (S)	590115	CLEAN AND PAINT STRUCTURAL STEEL	LS	LUMP SUM	LUMP SUM	

Item	Item Code	Item	Unit of Measure	Estimated Quantity	Unit Price	Item Total
41 (S-F)	590135	SPOT BLAST CLEAN AND PAINT UNDERCOAT	SQFT	213,000		
42 (S)	590301	WORK AREA MONITORING	LS	LUMP SUM	LUMP SUM	
43 (S-F)	750501	MISCELLANEOUS METAL (BRIDGE)	LB	285,000		
44 (S)	015015	LOWER DECK LIGHTING STERLING SUBSTATION TO SFA	LS	LUMP SUM	LUMP SUM	
45 (S)	015016	LOWER DECK LIGHTING SFA TO PIER W-2	LS	LUMP SUM	LUMP SUM	
46 (S)	015017	LOWER DECK LIGHTING PIER W-2 TO PIER W-3	LS	LUMP SUM	LUMP SUM	
47 (S)	015018	LOWER DECK LIGHTING PIER W-3 TO PIER W-5	LS	LUMP SUM	LUMP SUM	
48 (S)	015019	LOWER DECK LIGHTING PIER W-5 TO PIER W-6	LS	LUMP SUM	LUMP SUM	
49 (S)	015020	LOWER DECK LIGHTING PIER W-6 TO YBIA	LS	LUMP SUM	LUMP SUM	
50 (S)	015021	LOWER DECK LIGHTING YBI UTILITY TUNNEL	LS	LUMP SUM	LUMP SUM	
51 (S)	015022	LOWER DECK LIGHTING STERLING SUBSTATION	LS	LUMP SUM	LUMP SUM	
52 (S)	015023	LOWER DECK LIGHTING PIER W-4 SUBSTATION	LS	LUMP SUM	LUMP SUM	
53 (S)	015024	LOWER DECK LIGHTING YBI SUBSTATION	LS	LUMP SUM	LUMP SUM	
54 (S)	015025	BRIDGE TOWER NAVIGATION LIGHTING (MODIFICATION)	LS	LUMP SUM	LUMP SUM	
55 (S)	015026	MAGNETIC DETECTOR MODIFICATIONS	LS	LUMP SUM	LUMP SUM	
56 (S)	015027	CCTV CAMERA CABLES (MODIFICATION)	LS	LUMP SUM	LUMP SUM	
57 (S)	015028	BRIDGE PHONE SYSTEM MODIFICATIONS	LS	LUMP SUM	LUMP SUM	
58 (S)	015029	NAVL MODIFICATIONS	LS	LUMP SUM	LUMP SUM	
59 (S)	015030	EXISTING LIGHTING EQUIPMENT REMOVAL	LS	LUMP SUM	LUMP SUM	
60 (S)	015031	ELECTRICAL FACILITIES MODIFICATIONS SFA TO W1	LS	LUMP SUM	LUMP SUM	

Item	Item Code	Item	Unit of Measure	Estimated Quantity	Unit Price	Item Total
61 (S)	015032	MODIFICATION FROM DAMPER WORK AT SFA AND YBIA	LS	LUMP SUM	LUMP SUM	
62 (S)	015033	UTILITY PLATFORMS, CAMERA AND OLD CALL BOX SYSTEM MODIFICATIONS	LS	LUMP SUM	LUMP SUM	
63 (S)	015034	UPPER DECK LIGHTING FOUNDATION MODIFICATIONS	LS	LUMP SUM	LUMP SUM	
64 (S)	015035	LIGHTED SIGN, CONTINUOUS SPAN CHORD WORK , RTU FEEDER, TRUSS VERTICALS MODIFICATIONS	LS	LUMP SUM	LUMP SUM	
65 (S)	015036	MODIFICATION FROM UPPER CHORD WORK	LS	LUMP SUM	LUMP SUM	
66 (S)	015037	SPARES	LS	LUMP SUM	LUMP SUM	
67 (S)	015038	SOUTH PIER W-4 MODIFICATION	LS	LUMP SUM	LUMP SUM	
68 (S)	015039	NORTH PIER W-4 MODIFICATION	LS	LUMP SUM	LUMP SUM	
69 (S)	015040	15KV MODIFICATION	LS	LUMP SUM	LUMP SUM	
70 (S)	869072	SEISMIC MONITORING SYSTEM	LS	LUMP SUM	LUMP SUM	
71 (S)	047514	INSTALL SEISMIC MONITORING CASING	LF	175		
72 (S)	047515	INSTALL ELECTRICAL CONDUIT	LS	LUMP SUM	LUMP SUM	
73	999990	MOBILIZATION	LS	LUMP SUM	LUMP SUM	

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISIONS

Annexed to Contract No. 04-0435U4

SECTION 1. SPECIFICATIONS AND PLANS

The work embraced herein shall conform to the provisions in the Standard Specifications dated July, 1992, and the Standard Plans dated July, 1992, of the Department of Transportation insofar as the same may apply and these special provisions.

Amendments to the Standard Specifications set forth in these special provisions shall be considered as part of the Standard Specifications for the purposes set forth in Section 5-1.04, "Coordination and Interpretation of Plans, Standard Specifications and Special Provisions," of the Standard Specifications. Whenever either the term "Standard Specifications is amended" or the term "Standard Specifications are amended" is used in the special provisions, the indented text following said term shall be considered an amendment to the Standard Specifications. In case of conflict between such amendments and the Standard Specifications, the amendments shall take precedence over and be used in lieu of the conflicting portions.

In case of conflict between the Standard Specifications and these special provisions, the special provisions shall take precedence over and be used in lieu of the conflicting portions.

As-built plans and as-built working drawings shall be considered as essential parts of the contract for the purposes set forth in Section 5-1.04, "Coordination and Interpretation of Plans, Standard Specifications and Special Provisions, of the Standard Specifications.

In case of conflicts between the as-built plans or as-built working drawings, and the project plans, the project plans shall take precedence over and be used in lieu of the conflicting portions.

SECTION 2. PROPOSAL REQUIREMENTS AND CONDITIONS

2-1.01 GENERAL

The bidder's attention is directed to the provisions in Section 2, "Proposal Requirements and Conditions," of the Standard Specifications and these special provisions for the requirements and conditions which the bidder must observe in the preparation of the proposal form and the submission of the bid.

In addition to the subcontractors required to be listed in accordance with Section 2-1.054, "Required Listing of Proposed Subcontractors," of the Standard Specifications, each proposal shall have listed therein the name and address of each DVBE subcontractor to be used for credit in meeting the goal, and to whom the bidder proposes to directly subcontract portions of the work. The list of subcontractors shall also set forth the portion of work that will be done by each subcontractor listed. A sheet for listing the subcontractors is included in the Proposal.

If the Bidder submits cash or a cashier's check or a certified check as the form of bidder's security (See said Section 2-1.07 of the Standard Specifications), the Bidder shall also include with the bid submittal a signed and notarized affidavit from an admitted surety insurer that contract bonds, as required by Section 3-1.02, \"Contract Bonds,\" of the Standard Specifications, will be provided within the time specified elsewhere in these special provisions for executing and returning the contract for approval.

The form of Bidder's Bond mentioned in the last paragraph in Section 2-1.07, "Proposal Guaranty," of the Standard Specifications will be found following the signature page of the Proposal.

In accordance with Public Contract Code Section 7106, a Noncollusion Affidavit is included in the Proposal. Signing the Proposal shall also constitute signature of the Noncollusion Affidavit.

If the bidder claims a mistake was made in his bid, the bidder shall give the Department written notice within 48 hours, not including Saturdays, Sundays and legal holidays, after the opening of bids of the alleged mistake, in lieu of the 5 days specified in Section 2-1.095, \"Relief of Bidders,\" in the Standard Specifications. The notice of alleged mistake shall specify in detail how the mistake occurred.

2-1.02 DISABLED VETERAN BUSINESS ENTERPRISE (DVBE)

Section 10115 of the Public Contract Code requires the Department to implement provisions to establish a goal for Disabled Veterans Business Enterprise (DVBE) in contracts.

It is the policy of the Department that Disabled Veteran Business Enterprise (DVBE) shall have the maximum opportunity to participate in the performance of contracts financed solely with state funds. The Contractor shall ensure that DVBEs have the maximum opportunity to participate in the performance of this contract and shall take all necessary and reasonable steps for this assurance. The Contractor shall not discriminate on the basis of race, color, national origin, or sex in the award and performance of subcontracts. Failure to carry out the requirements of this paragraph shall constitute a breach of contract and may result in termination of this contract or other remedy the Department may deem appropriate.

Bidder's attention is directed to the following:

(a) "Disabled Veteran Business Enterprise" (DVBE) means a business concern certified as a DVBE by the Office of Small Business Certification and Resources, Department of General Services.

(b) A DVBE may participate as a prime contractor, subcontractor, joint venture partner with a prime or subcontractor, or vendor of material or supplies;

(c) Credit for DVBE prime contractors will be 100 percent.

(d) A DVBE joint venture partner must be responsible for specific contract items of work, or portions thereof. Responsibility means actually performing, managing and supervising the work with its own forces. The DVBE joint venture partner must share in the ownership, control, management responsibilities, risks and profits of the joint venture. The DVBE joint venturer must submit the joint venture agreement with the Caltrans Bidder DVBE Information form required in Section 2-1.04, \"Submission of DVBE Information," elsewhere in these special provisions;

(e) A DVBE must perform a commercially useful function, i.e., must be responsible for the execution of a distinct element of the work and must carry out its responsibility by actually performing, managing and supervising the work;

(f) Credit for DVBE vendors of materials or supplies is limited to 60 percent of the amount to be paid to the vendor for the material unless the vendor manufactures or substantially alters the goods;

(g) Credit for trucking by DVBEs will be as follows:

(1) One hundred percent of the amount to be paid when a DVBE trucker will perform the trucking with his/her own trucks, tractors and employees;

(2) Twenty percent of the amount to be paid to DVBE trucking brokers who do not have a "certified roster";

(3) One hundred percent of the amount to be paid to DVBE trucking brokers who have:

a. signed agreements that all trucking will be performed by DVBE truckers if credit is toward the DVBE goal;

b. a "certified roster" showing that all trucks are owned by DVBEs; and

c. a signed statement on the "certified roster" that indicates that 100 percent of revenue paid by the broker will be paid to the DVBEs listed on the "certified roster".

(4) Twenty percent of the amount to be paid to trucking brokers who are not a DVBE but who have:

a. signed agreements with DVBE truckers assuring that at least 20 percent of the trucking will be performed by DVBE truckers if credit is toward the DVBE goal;

b. a "certified roster" showing that at least 20 percent of the number of trucks are owned by DVBE truckers; and

c. a signed statement on the "certified roster" that indicates that at least 20 percent of the revenue paid by the broker will be paid to the DVBEs listed on the "certified roster".

The "certified roster" referred to herein shall conform to the requirements in Section 3-1.01A, "DVBE Information," elsewhere in these special provisions;

(h) DVBEs and DVBE joint venture partners must be certified DVBEs as determined by the Department of General Services, Office of Small Business Certification and Resources, 1531 "I" Street, Second Floor, Sacramento, CA 95814, on the date bids for the project are opened before credit may be allowed toward the DVBE goal.

It is the Contractor's responsibility to verify that DVBEs are certified;

(i) Noncompliance by the Contractor with these requirements constitutes a breach of this contract and may result in termination of the contract or other appropriate remedy for a breach of this contract.

2-1.03 DVBE GOAL FOR THIS PROJECT

The Department has established the following goal for Disabled Veteran Business Enterprise (DVBE) participation for this project:

Disabled Veteran Business Enterprise (DVBE), 3 percent.

It is the bidder's responsibility to make a sufficient portion of the work available to subcontractors and suppliers and to select those portions of the work or material needs consistent with the available DVBE subcontractors and suppliers, so as to assure meeting the goal for DVBE participation.

The Office of Small Business Certification and Resources, Department of General Services, may be contacted at (916) 322-5060 or visit their internet web site at http://www.osmb.dgs.ca.gov/ for program information and certification status. The Department's Business Enterprise Program may also be contacted at (916) 227-9599 or the internet web site at http://www.dot.ca.gov/hq/bep/.

2-1.04 SUBMISSION OF DVBE INFORMATION

The required DVBE information shall be submitted **WITH THE BID** on the following \"CALTRANS BIDDER - DVBE - INFORMATION\" and \"TELEPHONE LOG AND LIST OF REJECTED DVBEs.\"

It is the bidder's responsibility to meet the goal for DVBE participation or to establish that, prior to bidding, the bidder made good faith efforts to do so based on the information in the \"CALTRANS BIDDER - DVBE - INFORMATION\" and \"TELEPHONE LOG AND LIST OF REJECTED DVBEs.\"

The information to show that the DVBE goal will be met on the \"CALTRANS BIDDER - DVBE - INFORMATION\" form shall include the names of DVBEs and DVBE joint venture partners to be used, with a complete description of work or supplies to be provided by each and the dollar value of each such DVBE transaction. When 100 percent of a contract item of work is not to be performed or furnished by a DVBE, a description of the exact portion of said work to be performed or furnished by that DVBE shall be included in the DVBE information, including the planned location of said work. DVBE prime contractors shall enter their Office of Small Business Certification and Resources (OSBCR) - DVBE reference number and/or DBA name, as listed with OSBCR, on the line provided. (Note: DVBE subcontractors to whom the bidder proposes to directly subcontract portions of the work are to be named in the bid. - See Section 2-1.054, \"Required Listing of Proposed Subcontractors,\" of the Standard Specifications and Section 2-1.01, \"General,\" of these special provisions, regarding listing of proposed subcontractors).

If credit for trucking by a DVBE trucking broker is shown on the bidder's information as 100 percent of the revenue to be paid by the broker is to be paid to DVBE truckers, a \"certified roster\" of the broker's trucks to be used must be included with the bid. The \"certified roster\" must indicate that all the trucks are owned by certified DVBEs and must show the DVBE truck numbers, owner's name, Public Utilities Commission Cal-T numbers, and the DVBE certification numbers. The roster must indicate that all revenue paid by the broker will be paid to DVBEs listed on the \"certified roster\".

If credit for trucking by a trucking broker who is not a DVBE is shown in the bidder's information, a \"certified roster\" of the broker's trucks to be used must be included with the bid. The \"certified roster\" must indicate that at least 20 percent of the broker's trucks are owned by DVBEs and must show the DVBE truck numbers, owner's name, Public Utilities Commission Cal-T numbers, and the DVBE certification numbers. The roster must indicate that at least 20 percent of the revenue paid by the broker will be paid to DVBEs listed on the \"certified roster\".

Information necessary to establish the bidder's good faith efforts to meet the DVBE goals shall be included in the \"TELEPHONE LOG AND LIST OF REJECTED DVBEs\" form located in the Proposal and shall include:

1. The names, dates and times of notices of all certified DVBEs solicited by telephone for this project and the dates, times and methods used for following up initial solicitations to determine with certainty whether the DVBEs were interested.
2. The names of DVBEs who submitted bids which were not accepted and the reason for rejection of the DVBEs bid.

Bidders are cautioned that even though their submittal indicates they will meet the stated DVBE goal, their submittal should also include the telephone log and rejected DVBE information to protect their eligibility for award of the contract in the event the Department, in its review, finds that the goal has not been met.

It is the bidders responsibility to be available, by phone, both the day of and the day after the bid opening to answer questions and provide good faith effort clarification. The bidder shall also assure that listed DVBEs are available, by phone, on both days.

If it is found that the goal has not been met, the Department will review the information submitted with the bid to determine the bidder's good faith effort. In the event that the Department determines that a bidder has not made a good faith effort based on the information submitted with the bid and its independent investigation, the Department's decision will be final.

2-1.05 SMALL BUSINESS PREFERENCE

Attention is directed to \"Award and Execution of Contract\" elsewhere in these special provisions.

Attention is also directed to the Small Business Procurement and Contract Act, Government Code Section 14835, et seq and Title 2, California Code of Regulations, Section 1896, et seq.

Bidders who wish to be classified as a Small Business under the provisions of those laws and regulations, shall be certified as Small Business by the Department of General Services, Office of Small Business Certification and Resources, 1531 "I" Street, Second Floor, Sacramento, CA 95814.

To request Small Business Preference, bidders shall fill out and sign the Request for Small Business Preference form in the Proposal and shall attach a copy of their Office of Small Business Certification and Resources (OSBCR) small business certification letter to the form. The bidder's signature on the Request for Small Business Preference certifies, under penalty of perjury, that the bidder is certified as Small Business at the time of bid opening and further certifies, under penalty of perjury, that under the following conditions, at least 50 percent of the subcontractors to be utilized on the project are either certified Small Business or have applied for Small Business certification by bid opening date and are subsequently granted Small Business certification.

The conditions requiring the aforementioned 50 percent level of subcontracting by Small Business subcontractors apply if:

1. The lowest responsible bid for the project exceeds $100 000; and
2. The project work to be performed requires a Class A or a Class B contractor's license; and
3. Two or more subcontractors will be used.

If the above conditions apply and Small Business Preference is granted in the award of the contract, the 50 percent Small Business subcontractor utilization level shall be maintained throughout the life of the contract.

2-1.06 CALIFORNIA COMPANY PREFERENCE

Attention is directed to "Award and Execution of Contract" of these special provisions.

In accordance with the requirements of Section 6107 of the Public Contract Code, a "California company" will be granted a reciprocal preference for bid comparison purposes as against a nonresident contractor from any state that gives or requires a preference to be given contractors from that state on its public entity construction contracts.

A "California company" means a sole proprietorship, partnership, joint venture, corporation, or other business entity that was a licensed California contractor on the date when bids for the public contract were opened and meets one of the following:

(1) Has its principal place of business in California.

(2) Has its principal place of business in a state in which there is no local contractor preference on construction contracts.

(3) Has its principal place of business in a state in which there is a local contractor construction preference and the contractor has paid not less than $5000 in sales or use taxes to California for construction related activity for each of the five years immediately preceding the submission of the bid.

To carry out the "California company" reciprocal preference requirements of Section 6107 of the Public Contract Code, all bidders shall fill out and sign the California Company Preference form in the Proposal. The bidder's signature on the California Company Preference form certifies, under penalty of perjury, that the bidder is or is not a "California company" and if not, the amount of the preference applied by the state of the nonresident Contractor.

A nonresident Contractor shall disclose any and all bid preferences provided to the nonresident Contractor by the state or country in which the nonresident Contractor has its principal place of business.

Proposals without the California Company Preference form filled out and signed may be rejected.

2-1.07 BRIDGE SEISMIC RETROFIT INFORMATION/QUESTIONNAIRE

The Department has established the need to obtain information regarding each bidder's qualifications for performing bridge seismic retrofit work contracts.

Bidders shall submit responses to the "Bridge Seismic Retrofit Information/Questionnaire" included in the Proposal. The responses to the Questionnaire shall be submitted with the bid.

In signing the signature page of the Proposal, the bidder certifies that the information and answers on the "Bridge Seismic Retrofit Information/Questionnaire" are complete and accurate.

SECTION 3. PRE-AWARD MEETING AND AWARD AND EXECUTION OF CONTRACT

3-1.01 GENERAL

The bidder's attention is directed to the provisions in Section 3, "Award and Execution of Contract," of the Standard Specifications, and these special provisions for the requirements and conditions concerning the pre-award meeting and the award and execution of contract.

3-1.01A PRE-AWARD MEETING.--Bidders are advised that on **August 12, 1999** at 10:00 a.m., in the third floor conference room, 1727 - 30th Street, Sacramento, CA 95816, the apparent low bidder shall participate in a pre-award qualifications review meeting conducted by an agent of the Director. Non-attendance to the qualifications review meeting by the apparent low bidder shall be just cause for rejection of the bid and forfeiture of the proposal guaranty. At the qualifications review meeting, the low bidder shall be prepared to discuss and answer questions relative to the responses to the "Bridge Seismic Retrofit Information/Questionnaire" submitted with the bid. The Director's agent will prepare written findings and recommendations to the Engineer regarding award of the contract to the apparent low bidder based on the bridge seismic retrofit information and responses submitted with the bid, and on the information provided at the qualifications review meeting. The Engineer's determination on the bidder's qualifications for performing bridge seismic retrofit work, in a manner that is safe for the workers and the public, will be based on the bidder's experience, qualifications of on-site supervisory personnel, equipment, conceptual approach to the bridge seismic retrofit work and safety history of the bidder and its supervisory personnel. The decision of the Engineer regarding the bidder's qualifications shall be final.

The second and third apparent low bidders shall participate in pre-award qualifications review meetings if requested to do so by the Department. Notification by the Department will be within 7 days after the bid opening, and will be provided at least 12 hours prior to the qualifications review meeting. Non-attendance by the second or third apparent low bidder at any such requested meeting shall be just cause for rejection of bid and forfeiture of the proposal guaranty.

3-1.01B AWARD AND EXECUTION OF CONTRACT.--The award of contract, if it be awarded, will be to the lowest responsible bidder whose proposal complies with all the requirements prescribed and who has met the goal for DVBE participation or has demonstrated, to the satisfaction of the Department, good faith effort to do so and who has established to the satisfaction of the Engineer, the qualifications and ability to complete the seismic retrofit work on this project in a safe and timely manner. Meeting the goal for DVBE participation or demonstrating, to the satisfaction of the Department, good faith efforts to do so and establishing the qualifications and ability to complete the seismic retrofit work are conditions for being eligible for award of contract.

It is anticipated that this contract will be awarded within 10 days after the bid opening.

The contract shall be signed by the successful bidder and shall be received with contract bonds by the Department within **4 days**, including Saturdays, Sundays and legal holidays, after the bidder has received notice that the contract has been awarded. Failure to do so shall be just cause for forfeiture of the proposal guaranty. The executed contract documents shall be delivered to the following address: Department of Transportation, P.O. Box 942874, Sacramento, CA 94274-0001, Attn: Office Engineer (MS 43)- Contracts.

Within 2 days, not including Saturdays, Sundays and legal holidays, of return of the executed contract and bonds, the Department will notify the successful bidder of either approval of the contract by the Attorney General or the attorney appointed and authorized to represent the Department of Transportation, or disapproval of the submittal. Should the Department fail to provide notification within said 2 days, the delay will be considered a right of way delay as specified in Section 8-1.09, \"Right of Way Delays,\" of the Standard Specifications.

A \"Vendor Data Record\" form will be included in the contract documents to be executed by the successful bidder. The purpose of the form is to facilitate the collection of taxpayer identification data. The form shall be completed and

returned to the Department by the successful bidder with the executed contract and contract bonds. For the purposes of the form, vendor shall be deemed to mean the successful bidder. The form is not to be completed for subcontractors or suppliers. Failure to complete and return the \"Vendor Data Record\" form to the Department as provided herein will result in the retention of 20 percent of payments due the contractor and penalties of up to $20 000. This retention of payments for failure to complete the \"Vendor Data Record\" form is in addition to any other retention of payments due the Contractor.

Attention is also directed to \"Small Business Preference\" of these special provisions. Any bidder who is certified as a Small Business by the Department of General Services, Office of Small Business Certification and Resources will be allowed a preference in the award of this contract, if it be awarded, under the following conditions:

(1) The apparent low bidder is not certified as a Small Business, or has not filled out and signed the Request for Small Business Preference included with the bid documents and attached a copy of their Office of Small Business Certification and Resources (OSBCR) small business certification letter to the form; and

(2) The bidder filled out and signed the Request for Small Business Preference form included with the bid documents and attached a copy of their Office of Small Business Certification and Resources (OSBCR) small business certification letter to the form.

The small business preference will be a reduction in the bid submitted by the small business contractor, for bid comparison purposes, by an amount equal to 5 percent of the amount bid by the apparent low bidder, the amount not to exceed $50 000. If this reduction results in the small business contractor becoming the low bidder, then the contract will be awarded to the small business contractor on the basis of the actual bid of the small business contractor notwithstanding the reduced bid price used for bid comparison purposes.

Attention is also directed to \"California Company Preference\" of these special provisions.

The amount of the California company reciprocal preference shall be equal to the amount of the preference applied by the state of the nonresident contractor with the lowest responsive bid, except where the \"California company\" is eligible for a California Small Business Preference, in which case the preference applied shall be the greater of the two, but not both.

If the bidder submitting the lowest responsive bid is not a \"California company\" and with the benefit of the reciprocal preference, a \"California company's\" responsive bid is equal to or less than the original lowest responsive bid, the \"California company\" will be awarded the contract at its submitted bid price except as provided below.

Small business bidders shall have precedence over nonsmall business bidders in that the application of the \"California company\" preference for which nonsmall business bidders may be eligible shall not result in the denial of the award to a small business bidder.

SECTION 4. BEGINNING OF WORK, TIME OF COMPLETION AND LIQUIDATED DAMAGES

Attention is directed to the provisions in Section 8-1.03, "Beginning of Work," in Section 8-1.06, "Time of Completion," and in Section 8-1.07, "Liquidated Damages," of the Standard Specifications and these special provisions.

The Contractor shall begin work within 5 calendar days after the contract has been approved by the Attorney General or the attorney appointed and authorized to represent the Department of Transportation.

This work shall be diligently prosecuted to completion before the expiration of

1250 WORKING DAYS

beginning at 12:01 a.m. on the **FIRST WORKING DAY AFTER CONTRACT AWARD.**

The Contractor shall pay to the State of California the sum of $5200 per day, for each and every calendar day's delay in finishing the work in excess of the number of working days prescribed above.

The 72 hours advance notice before beginning work as referred to in said Section 8-1.03 is changed to 24 hours advance notice for this project.

A working day as defined in said Section 8-1.06 is re-defined for this project. Subparagraph (a) of the second paragraph in said Section 8-1.06 shall not apply. Saturdays, Sundays and legal holidays, except days of inclement weather, will be counted as working days.

The time limit specified for the completion of the work contemplated herein is considered insufficient to permit completion of the work by the Contractor working a normal number of hours per day or week on a single shift basis. Should the Contractor fail to maintain the progress of the work in accordance with the \"Progress Schedule\" required in

these special provisions, additional shifts will be required to the extent necessary to ensure that the progress conforms to the abovementioned schedule and that the work will be completed within the time limit specified.

Full compensation for any additional costs occasioned by compliance with the provisions in this section shall be considered as included in the prices paid for the various contract items of work and no additional compensation will be allowed therefor.

SECTION 5. GENERAL

SECTION 5-1. MISCELLANEOUS

5-1.00 PLANS AND WORKING DRAWINGS

When the specifications require working drawings to be submitted to the Office of Structure Design, the drawings shall be submitted to: Office of Structure Design, Documents Unit, P.O. Box 942874, Mail Station 9, Sacramento, CA 94274-0001 (1801 30th Street, Sacramento, CA 95816), Telephone (916) 227-8252.

5-1.005 CONTRACT BONDS

Attention is directed to Section 31.02, "Contract Bonds," of the Standard Specifications and these special provisions.

The payment bond shall be in a sum not less than the following:

1. One hundred percent of the total amount payable by the terms of the contract when the total amount payable does not equal or exceed five million dollars ($5 000 000).
2. Fifty percent of the total amount payable by the terms of the contract when the total amount payable is not less than five million dollars ($5 000 000) and does not exceed ten million dollars ($10 000 000).
3. Twenty-five percent of the total amount payable by the terms of the contract when the total amount payable exceeds ten million dollars ($10 000 000).

5-1.01 LABOR NONDISCRIMINATION

Attention is directed to the following Notice that is required by Chapter 5 of Division 4 of Title 2, California Code of Regulations.

NOTICE OF REQUIREMENT FOR NONDISCRIMINATION PROGRAM
(GOV. CODE, SECTION 12990)

Your attention is called to the "Nondiscrimination Clause", set forth in Section 7-1.01A(4), "Labor Nondiscrimination," of the Standard Specifications, which is applicable to all nonexempt state contracts and subcontracts, and to the "Standard California Nondiscrimination Construction Contract Specifications" set forth therein. The Specifications are applicable to all nonexempt state construction contracts and subcontracts of $5,000 or more.

5-1.02 LABOR CODE REQUIREMENTS

Section 7-1.01A(1), "Hours of Labor," of the Standard Specifications is amended to read:

7-1.01A(1) Hours of Labor.— Eight hours labor constitutes a legal day's work. The Contractor or any subcontractor under the Contractor shall forfeit, as a penalty to the State of California, $25 for each worker employed in the execution of the contract by the respective Contractor or subcontractor for each calendar day during which that worker is required or permitted to work more than 8 hours in any one calendar day and 40 hours in any one calendar week in violation of the provisions of the Labor Code, and in particular, Section 1810 to Section 1815, thereof, inclusive, except that work performed by employees of Contractors in excess of 8 hours per day, and 40 hours during any one week, shall be permitted upon compensation for all hours worked in excess of 8 hours per day at not less than one and one-half times the basic rate of pay, as provided in Section 1815 thereof.

Section 7-1.01A(2), "Prevailing Wage," of the Standard Specifications is amended to read:

7-1.01A(2) Prevailing Wage.— The Contractor and any subcontractor under the Contractor shall comply with Labor Code Sections 1774 and 1775. Pursuant to Section 1775, the Contractor and any subcontractor under the

Contractor shall forfeit to the State or political subdivision on whose behalf the contract is made or awarded a penalty of not more than fifty dollars ($50) for each calendar day, or portion thereof, for each worker paid less than the prevailing rates as determined by the Director of Industrial Relations for the work or craft in which the worker is employed for any public work done under the contract by the Contractor or by any subcontractor under the Contractor in violation of the provisions of the Labor Code and in particular, Labor Code Sections 1770 to 1780, inclusive. The amount of this forfeiture shall be determined by the Labor Commissioner and shall be based on consideration of the mistake, inadvertence, or neglect of the Contractor or subcontractor in failing to pay the correct rate of prevailing wages, or the previous record of the Contractor or subcontractor in meeting their respective prevailing wage obligations, or the willful failure by the Contractor or subcontractor to pay the correct rates of prevailing wages. A mistake, inadvertence, or neglect in failing to pay the correct rate of prevailing wages is not excusable if the Contractor or subcontractor had knowledge of the obligations under the Labor Code. In addition to the penalty and pursuant to Labor Code Section 1775, the difference between the prevailing wage rates and the amount paid to each worker for each calendar day or portion thereof for which each worker was paid less than the prevailing wage rate shall be paid to each worker by the Contractor or subcontractor. If a worker employed by a subcontractor on a public works project is not paid the general prevailing per diem wages by the subcontractor, the prime contractor of the project is not liable for the penalties described above unless the prime contractor had knowledge of that failure of the subcontractor to pay the specified prevailing rate of wages to those workers or unless the prime contractor fails to comply with all of the following requirements:

1. The contract executed between the contractor and the subcontractor for the performance of work on the public works project shall include a copy of the provisions of Sections 1771, 1775, 1776, 1777.5, 1813, and 1815 of the Labor Code.
2. The contractor shall monitor the payment of the specified general prevailing rate of per diem wages by the subcontractor to the employees, by periodic review of the certified payroll records of the subcontractor.
3. Upon becoming aware of the subcontractor's failure to pay the specified prevailing rate of wages to the subcontractor's workers, the contractor shall diligently take corrective action to halt or rectify the failure, including, but not limited to, retaining sufficient funds due the subcontractor for work performed on the public works project.
4. Prior to making final payment to the subcontractor for work performed on the public works project, the contractor shall obtain an affidavit signed under penalty of perjury from the subcontractor that the subcontractor has paid the specified general prevailing rate of per diem wages to the subcontractor's employees on the public works project and any amounts due pursuant to Section 1813 of the Labor Code.

Pursuant to Section 1775 of the Labor Code, the Division of Labor Standards Enforcement shall notify the Contractor on a public works project within 15 days of the receipt by the Division of Labor Standards Enforcement of a complaint of the failure of a subcontractor on that public works project to pay workers the general prevailing rate of per diem wages. If the Division of Labor Standards Enforcement determines that employees of a subcontractor were not paid the general prevailing rate of per diem wages and if the Department did not retain sufficient money under the contract to pay those employees the balance of wages owed under the general prevailing rate of per diem wages, the contractor shall withhold an amount of moneys due the subcontractor sufficient to pay those employees the general prevailing rate of per diem wages if requested by the Division of Labor Standards Enforcement. The Contractor shall pay any money retained from and owed to a subcontractor upon receipt of notification by the Division of Labor Standards Enforcement that the wage complaint has been resolved. If notice of the resolution of the wage complaint has not been received by the Contractor within 180 days of the filing of a valid notice of completion or acceptance of the public works project, whichever occurs later, the Contractor shall pay all moneys retained from the subcontractor to the Department. These moneys shall be retained by the Department pending the final decision of an enforcement action.

Pursuant to the provisions of Section 1773 of the Labor Code, the Department has obtained the general prevailing rate of wages (which rate includes employer payments for health and welfare, pension, vacation, travel time, and subsistence pay as provided for in Section 1773.8 of the Labor Code, apprenticeship or other training programs authorized by Section 3093 of the Labor Code, and similar purposes) applicable to the work to be done, for straight time, overtime, Saturday, Sunday and holiday work. The holiday wage rate listed shall be applicable to all holidays recognized in the collective bargaining agreement of the particular craft, classification or type of workmen concerned. The general prevailing wage rates and any applicable changes to these wage rates are available at the Labor Compliance Office at the offices of the District Director of Transportation for the district in which the work is situated. For work situated in District 9, the wage rates are available at the Labor Compliance Office at the offices of

the District Director of Transportation for District 6, located at Fresno. General prevailing wage rates are also available from the California Department of Industrial Relations' Internet Web Site at: http://www.dir.ca.gov.

The wage rates determined by the Director of Industrial Relations for the project refer to expiration dates. Prevailing wage determinations with a single asterisk after the expiration date are in effect on the date of advertisement for bids and are good for the life of the contract. Prevailing wage determinations with double asterisks after the expiration date indicate that the wage rate to be paid for work performed after this date has been determined. If work is to extend past this date, the new rate shall be paid and incorporated in the contract. The Contractor shall contact the Department of Industrial Relations as indicated in the wage rate determinations to obtain predetermined wage changes.

Pursuant to Section 1773.2 of the Labor Code, general prevailing wage rates shall be posted by the Contractor at a prominent place at the site of the work.

Changes in general prevailing wage determinations which conform to Labor Code Section 1773.6 and Title 8 California Code of Regulations Section 16204 shall apply to the project when issued by the Director of Industrial Relations at least 10 days prior to the date of the Notice to Contractors for the project.

The State will not recognize any claim for additional compensation because of the payment by the Contractor of any wage rate in excess of the prevailing wage rate set forth in the contract. The possibility of wage increases is one of the elements to be considered by the Contractor in determining the bid, and will not under any circumstances be considered as the basis of a claim against the State on the contract.

7-1.01A(2)(a) Travel and Subsistence Payments.— Attention is directed to the requirements of Section 1773.8 of the Labor Code. The Contractor shall make travel and subsistence payments to each workman, needed to execute the work, in accordance with the requirements in Labor Code Section 1773.8.

The first and second paragraphs of Section 7-1.01A(3), "Payroll Records," of the Standard Specifications are amended to read:

7-1.01A(3) Payroll Records.— Attention is directed to the provisions of Labor Code Section 1776, a portion of which is quoted below. Regulations implementing Labor Code Section 1776 are located in Sections 16016 through 16019 and Sections 16207.10 through 16207.19 of Title 8, California Code of Regulations.

"1776. (a) Each contractor and subcontractor shall keep accurate payroll records, showing the name, address, social security number, work classification, straight time and overtime hours worked each day and week, and the actual per diem wages paid to each journeyman, apprentice, worker, or other employee employed by him or her in connection with the public work. Each payroll record shall contain or be verified by a written declaration that it is made under penalty of perjury, stating both of the following:

(1) The information contained in the payroll record is true and correct.

(2) The employer has complied with the requirements of Sections 1771, 1811, and 1815 for any work performed by his or her employees on the public works project.

"(b) The payroll records enumerated under subdivision (a) shall be certified and shall be available for inspection at all reasonable hours at the principal office of the contractor on the following basis:

(1) A certified copy of an employee's payroll record shall be made available for inspection or furnished to the employee or his or her authorized representative on request.

(2) A certified copy of all payroll records enumerated in subdivision (a) shall be made available for inspection or furnished upon request to a representative of the body awarding the contract, the Division of Labor Standards Enforcement, and the Division of Apprenticeship Standards of the Department of Industrial Relations.

(3) A certified copy of all payroll records enumerated in subdivision (a) shall be made available upon request by the public for inspection or for copies thereof. However, a request by the public shall be made through either the body awarding the contract, the Division of Apprenticeship Standards, or the Division of Labor Standards Enforcement. If the requested payroll records have not been provided pursuant to paragraph (2), the requesting party shall, prior to being provided the records, reimburse the costs of preparation by the contractor, subcontractors, and the entity through which the request was made. The public shall not be given access to the records at the principal office of the contractor.

"(c) The certified payroll records shall be on forms provided by the Division of Labor Standards Enforcement or shall contain the same information as the forms provided by the division.

"(d) A contractor or subcontractor shall file a certified copy of the records enumerated in subdivision (a) with the entity that requested the records within 10 days after receipt of a written request.

"(e) Any copy of records made available for inspection as copies and furnished upon request to the public or any public agency by the awarding body, the Division of Apprenticeship Standards, or the Division of Labor Standards Enforcement shall be marked or obliterated in a manner so as to prevent disclosure of an individual's name, address, and social security number. The name and address of the contractor awarded the contract or the subcontractor performing the contract shall not be marked or obliterated.

"(f) The contractor shall inform the body awarding the contract of the location of the records enumerated under subdivision (a), including the street address, city and county, and shall, within five working days, provide a notice of a change of location and address.

"(g) The contractor or subcontractor shall have 10 days in which to comply subsequent to receipt of a written notice requesting the records enumerated in subdivision (a). In the event that the contractor or subcontractor fails to comply within the 10-day period, he or she shall, as a penalty to the state or political subdivision on whose behalf the contract is made or awarded, forfeit twenty-five dollars ($25) for each calendar day, or portion thereof, for each worker, until strict compliance is effectuated. Upon the request of the Division of Apprenticeship Standards or the Division of Labor Standards Enforcement, these penalties shall be withheld from progress payments then due. A contractor is not subject to a penalty assessment pursuant to this section due to the failure of a subcontractor to comply with this section."

The penalties specified in subdivision (g) of Labor Code Section 1776 for noncompliance with the provisions of Section 1776 may be deducted from any moneys due or which may become due to the Contractor.

5-1.03 CONTRACTOR'S LICENSING LAWS

The third paragraph of Section 7-1.01C, "Contractor's Licensing Laws," of the Standard Specifications is amended to read:

Attention is also directed to the provisions of Public Contract Code Section 10164. In all projects where Federal funds are involved, the Contractor shall be properly licensed at the time the contract is awarded.

5-1.035 INDEMNIFICATION AND INSURANCE

Section 7-1.12, "Responsibility for Damage," of the Standard Specifications is deleted.

The Standard Specifications is amended by adding the following Section 7-1.121, "Indemnification," and Section 7-1.122, "Insurance," before Section 7-1.125, "Legal Action Against the Department."

7-1.121 Indemnification.—With the exception that this section shall in no event be construed to require indemnification by the Contractor to a greater extent than permitted by law, the Contractor shall defend, indemnify and save harmless the State, including its officers, directors, agents (excluding agents who are design professionals), and employees, and each of them (Indemnitees), from any and all claims, demands, causes of action, damages, costs, expenses, actual attorneys' fees, losses or liabilities, in law or in equity, of every kind and nature whatsoever (Claims), arising out of or in connection with the Contractor's performance of this contract for:

A. Bodily injury including, but not limited to, bodily injury, sickness or disease, emotional injury or death to persons, including, but not limited to, the public, any employees or agents of the Contractor, State, Department, or any other contractor and;
B. Damage to property of anyone including loss of use thereof;

caused or alleged to be caused in whole or in part by any negligent or otherwise legally actionable act or omission of the Contractor or anyone directly or indirectly employed by the Contractor or anyone for whose acts the Contractor may be liable.

Except as otherwise provided by law, the indemnification provisions above shall apply regardless of the existence or degree of fault of Indemnitees. The Contractor, however, shall not be obligated to indemnify Indemnitees for Claims arising from conduct delineated in Civil Code section 2782. Further, the Contractor's indemnity obligation shall not extend to Claims to the extent they arise from any defective or substandard condition of the roadway which existed at or prior to the time the Contractor commenced work, unless this condition has been changed by the work or the scope of the work requires the Contractor to maintain existing Roadway facilities and the

claim arises from the Contractor's failure to maintain. The Contractor's indemnity obligation shall extend to Claims arising after the work is completed and accepted only if these Claims are directly related to alleged acts or omissions of the Contractor which occurred during the course of the work. No inspection by the Department, its employees or agents shall be deemed a waiver by the Department of full compliance with the requirements of this section.

The Contractor's obligation to defend and indemnify shall not be excused because of the Contractor's inability to evaluate liability or because the Contractor evaluates liability and determines that the Contractor is not liable to the claimant. The Contractor will respond within 30 days to the tender of any claim for defense and indemnity by the State, unless this time has been extended by the State. If the Contractor fails to accept or reject a tender of defense and indemnity within 30 days, in addition to any other remedy authorized by law, so much of the money due the Contractor under and by virtue of the contract as shall reasonably be considered necessary by the Department, may be retained by the State until disposition has been made of the claim or suit for damages, or until the Contractor accepts or rejects the tender of defense, whichever occurs first.

With respect to third party claims against the Contractor, the Contractor waives any and all rights of any type to express or implied indemnity against the State, its directors, officers, employees, or agents (excluding agents who are design professionals).

7-1.122 Insurance.—Insurance shall conform to the following requirements:

7-1.122A Casualty Insurance.—The Contractor shall, at the Contractor's expense, procure and maintain insurance on all of its operations with companies acceptable to the Department as follows. All insurance shall be kept in full force and effect from the beginning of the work through final acceptance by the State. In addition, the Contractor shall maintain completed operations coverage with a carrier acceptable to the Department through the expiration of the patent deficiency in construction statute of repose set forth in Section 337.1 of the Code of Civil Procedure.

7-1.122A(1) Workers' Compensation and Employer's Liability Insurance.—Workers' Compensation insurance shall be provided as specified in Section 7-1.01A(6), "Workers' Compensation." Employer's Liability Insurance shall be provided in amounts not less than:

(a) $1,000,000 for each accident for bodily injury by accident.
(b) $1,000,000 policy limit for bodily injury by disease.
(c) $1,000,000 for each employee for bodily injury by disease.

If there is an exposure of injury to the Contractors' employees under the U.S. Longshoremen's and Harbor Workers' Compensation Act, the Jones Act or under laws, regulations or statutes applicable to maritime employees, coverage shall be included for such injuries or claims.

7-1.122A(2) Liability Insurance.—The Contractor shall carry General Liability and Umbrella or Excess Liability Insurance covering all operations by or on behalf of the Contractor providing insurance for bodily injury liability, and property damage liability for the limits of liability indicated below and including coverage for:

(a) premises, operations and mobile equipment
(b) products and completed operations
(c) broad form property damage (including completed operations)
(d) explosion, collapse and underground hazards
(e) personal injury
(f) contractual liability

7-1.122A(3) Liability Limits/Additional Insureds.—The limits of liability shall be at least:

(a) $1,000,000 for each occurrence (combined single limit for bodily injury and property damage).
(b) $2,000,000 aggregate for products-completed operations.
(c) $2,000,000 general aggregate. This general aggregate limit shall apply separately to the Contractor's work under this Agreement.

(d) $5,000,000 umbrella or excess liability. For projects over $25,000,000 only, an additional $10,000,000 umbrella or excess liability (for a total of $15,000,000). Umbrella or excess policy shall include products liability completed operations coverage and may be subject to $5,000,000 or $15,000,000 aggregate limits. Further, the umbrella or excess policy shall contain a clause stating that it takes effect (drops down) in the event the primary limits are impaired or exhausted.

The State and the Department, including their officers, directors, agents (excluding agents who are design professionals), and Department employees, shall be named as additional insureds under the General Liability and Umbrella Liability Policies with respect to liability arising out of or connected with work or operations performed by or on behalf of the Contractor under this contract. Coverage for such additional insureds shall not extend to liability:

(1) arising from any defective or substandard condition of the Roadway which existed at or prior to the time the Contractor commenced work, unless such condition has been changed by the work or the scope of the work requires the Contractor to maintain existing Roadway facilities and the claim arises from the Contractor's failure to maintain; or
(2) for claims occurring after the work is completed and accepted unless these claims are directly related to alleged acts or omissions of the Contractor which occurred during the course of the work; or
(3) to the extent prohibited by Section 11580.04 of the Insurance Code.

The policy shall stipulate that the insurance afforded the additional insureds shall apply as primary insurance. Any other insurance or self insurance maintained by the Department or State will be excess only and shall not be called upon to contribute with this insurance. Such additional insured coverage shall be provided by a policy provision or by an endorsement providing coverage at least as broad as Additional Insured (Form B) endorsement form CG 2010, as published by the Insurance Services Office (ISO).

7-1.122B Automobile Liability Insurance.—The Contractor shall carry automobile liability insurance, including coverage for all owned, hired and non-owned automobiles. The primary limits of liability shall be not less than $1,000,000 combined single limit each accident for bodily injury and property damage. The umbrella or excess liability coverage required under Section 7-1.122A(3), "Liability Limits/Additional Insureds," shall also apply to automobile liability.

7-1.122C Policy Forms, Endorsements and Certificates.—The Contractor's General Liability Insurance shall be provided under Commercial General Liability policy form no. CG0001 as published by the Insurance Services Office (ISO) or under a policy form at least as broad as policy form no. CG0001.

Evidence of insurance in a form acceptable to the Department, including the required "additional insured" endorsements, shall be furnished by the Contractor to the Department at or prior to the pre-construction conference. The evidence of insurance shall provide that there will be no cancellation, lapse, or reduction of coverage without thirty (30) days' prior written notice to the Department. Certificates of Insurance, as evidence of required insurance, for the General Liability, Auto Liability and Umbrella-Excess Liability policies shall set forth deductible amounts applicable to each policy and all exclusions which are added by endorsement to each policy. The Department may expressly allow deductible clauses, which it does not consider excessive, overly broad, or harmful to the interests of the State. Standard ISO form CG 0001 or similar exclusions will be allowed provided they are not inconsistent with the requirements of this section. Allowance of any additional exclusions is at the discretion of the Department. Regardless of the allowance of exclusions or deductions by the Department, the Contractor shall be responsible for any deductible amount and shall warrant that the coverage provided to the Department is consistent with the requirements of this section.

7-1.122D Enforcement.—The Department may take any steps as are necessary to assure Contractor's compliance with its obligations. Should any insurance policy lapse or be canceled during the contract period the Contractor shall, within thirty (30) days prior to the effective expiration or cancellation date, furnish the Department with evidence of renewal or replacement of the policy. Failure to continuously maintain insurance coverage as herein provided is a material breach of contract. In the event the Contractor fails to maintain any insurance coverage required, the Department may, but is not required to, maintain this coverage and charge the expense to the Contractor or terminate this Agreement. The required insurance shall be subject to the approval of Department, but any acceptance of insurance certificates by the Department shall in no way limit or relieve the Contractor of the

Contractor's duties and responsibilities under the Contract to indemnify, defend and hold harmless the State, its officers, agents, and employees. Insurance coverage in the minimum amounts set forth herein shall not be construed to relieve the Contractor for liability in excess of such coverage, nor shall it preclude the State from taking other actions as is available to it under any other provision of the contract or law. Failure of the Department to enforce in a timely manner any of the provisions of this section shall not act as a waiver to enforcement of any of these provisions at a later date.

7-1.122E Self-Insurance.—Self-insurance programs and self-insured retentions in insurance policies are subject to separate annual review and approval by the State of evidence of the Contractor's financial capacity to respond. Additionally, self-insurance programs or retentions must provide the State with at least the same protection from liability and defense of suits as would be afforded by first-dollar insurance.

7-1.122F Miscellaneous.—Nothing contained in the Contract is intended to make the public or any member thereof a third party beneficiary of the Insurance or Indemnity provisions of these Standard Specifications, nor is any term, condition or other provision of the Contract intended to establish a standard of care owed to the public or any member thereof.

5-1.04 ARBITRATION

The last paragraph in Section 9-1.10, "Arbitration," of the Standard Specifications is amended to read:

Arbitration shall be initiated by a Complaint in Arbitration made in compliance with the requirements of those regulations. A Complaint in Arbitration by the Contractor shall be made not later than 90 days after the date of service in person or by mail on the Contractor of the final written decision by the Department on the claim.

5-1.05 NOTICE OF POTENTIAL CLAIM

Section 9-1.04, "Notice of Potential Claim," of the Standard Specifications is amended to read:

9-1.04 Notice of Potential Claim.--The Contractor shall not be entitled to the payment of any additional compensation for any act, or failure to act, by the Engineer, including failure or refusal to issue a change order, or for the happening of any event, thing, occurrence, or other cause, unless he shall have given the Engineer due written notice of potential claim as hereinafter specified. Compliance with this Section 9-1.04 shall not be a prerequisite as to matters within the scope of the protest provisions in Section 41.03, "Changes," or Section 81.06, "Time of Completion," or the notice provisions in Section 5-1.116, "Differing Site Conditions," or Section 8-1.07, "Liquidated Damages," or Section 8-1.10, "Utility and Non-Highway Facilities," nor to any claim which is based on differences in measurements or errors of computation as to contract quantities.

The written notice of potential claim shall be submitted to the Engineer prior to the time that the Contractor performs the work giving rise to the potential claim for additional compensation, if based on an act or failure to act by the Engineer, or in all other cases within 15 days after the happening of the event, thing, occurrence, or other cause, giving rise to the potential claim.

The written notice of potential claim shall be submitted on Form CEM-6201 furnished by the Department and shall be certified with reference to the California False Claims Act, Government Code Sections 12650 - 12655. The notice shall set forth the reasons for which the Contractor believes additional compensation will or may be due and the nature of the costs involved. Unless the amount of the potential claim has been stated in the written notice, the Contractor shall, within 15 days of submitting said notice, furnish an estimate of the cost of the affected work and impacts, if any, on project completion. Said estimate of costs may be changed or updated by the Contractor when conditions have changed. When the affected work is completed, the Contractor shall submit substantiation of his actual costs. Failure to do so shall be sufficient cause for denial of any claim subsequently filed on the basis of said notice of potential claim.

It is the intention of this Section 9-1.04 that differences between the parties arising under and by virtue of the contract be brought to the attention of the Engineer at the earliest possible time in order that such matters may be settled, if possible, or other appropriate action promptly taken. The Contractor hereby agrees that he shall have no right to additional compensation for any claim that may be based on any such act, failure to act, event, thing or occurrence for which no written notice of potential claim as herein required was filed.

Should the Contractor, in connection with or subsequent to the assertion of a potential claim, request inspection and copying of documents or records in the possession of the Department that pertain to the potential claim,

Contractor shall make its records of the project, as deemed by the Department to be pertinent to the potential claim, available to the Department for inspection and copying.

5-1.06 PARTIAL PAYMENTS

The last paragraph of Section 9-1.06, "Partial Payments," of the Standard Specifications is amended to read:

Attention is directed to the prohibitions and penalties pertaining to unlicensed contractors as provided in Business and Professions Code Sections 7028.15(a) and 7031.

5-1.07 PAYMENT OF WITHHELD FUNDS

Section 9-1.065, "Payment of Withheld Funds," of the Standard Specifications, is amended by adding the following after the third paragraph:

Alternatively, and subject to the approval of the Department, the payment of retentions earned may be deposited directly with a person licensed under Division 6 (commencing with Section 17000) of the Financial Code as the escrow agent. Upon written request of an escrow agent that has not been approved by the Department under subdivision (c) of Section 10263 of the Public Contract Code, the Department will provide written notice to that escrow agent within 10 business days of receipt of the request indicating the reason or reasons for not approving that escrow agent. The payments will be deposited in a trust account with a Federally chartered bank or savings association within 24 hours of receipt by the escrow agent. The Contractor shall not place any retentions with the escrow agent in excess of the coverage provided to that escrow agent pursuant to subdivision (b) of Section 17314 of the Financial Code. In all respects not inconsistent with subdivision (c) of Section 10263 of the Public Contract Code, the remaining provisions of Section 10263 of the Public Contract Code shall apply to escrow agents acting pursuant to subdivision (c) of Section 10263 of the Public Contract Code.

5-1.08 FINAL PAYMENT AND CLAIMS

Section 9-1.07B, "Final Payment and Claims," of the Standard Specifications is amended to read:

9-1.07B Final Payment and Claims.--After acceptance by the Director, the Engineer will make a proposed final estimate in writing of the total amount payable to the Contractor, including therein an itemization of said amount, segregated as to contract item quantities, extra work and any other basis for payment, and shall also show therein all deductions made or to be made for prior payments and amounts to be kept or retained under the provisions of the contract. All prior estimates and payments shall be subject to correction in the proposed final estimate. The Contractor shall submit written approval of the proposed final estimate or a written statement of all claims arising under or by virtue of the contract so that the Engineer receives such written approval or statement of claims no later than close of business of the thirtieth day after receiving the proposed final estimate. If the thirtieth day falls on a Saturday, Sunday or legal holiday, then receipt of such written approval or statement of claims by the Engineer shall not be later than close of business of the next business day. No claim will be considered that was not included in the written statement of claims, nor will any claim be allowed as to which a notice or protest is required under the provisions in Sections 4-1.03, "Changes," 8-1.06, "Time of Completion," 8-1.07, "Liquidated Damages," 5-1.116, "Differing Site Conditions," 8-1.10, "Utility and Non-Highway Facilities," and 9-1.04, "Notice of Potential Claim," unless the Contractor has complied with the notice or protest requirements in said sections.

On the Contractor's approval, or if he files no claim within said period of 30 days, the Engineer will issue a final estimate in writing in accordance with the proposed final estimate submitted to the Contractor and within 30 days thereafter the State will pay the entire sum so found to be due. Such final estimate and payment thereon shall be conclusive and binding against both parties to the contract on all questions relating to the amount of work done and the compensation payable therefor, except as otherwise provided in Sections 9-1.03C, "Records," and 9-1.09, "Clerical Errors."

If the Contractor within said period of 30 days files claims, the Engineer will issue a semifinal estimate in accordance with the proposed final estimate submitted to the Contractor and within 30 days thereafter the State will pay the sum so found to be due. Such semifinal estimate and payment thereon shall be conclusive and binding against both parties to the contract on all questions relating to the amount of work done and the compensation payable therefor, except insofar as affected by the claims filed within the time and in the manner required hereunder and except as otherwise provided in Sections 9-1.03C, "Records," and 9-1.09, "Clerical Errors."

Claims filed by the Contractor shall be in sufficient detail to enable the Engineer to ascertain the basis and amount of said claims. If additional information or details are required by the Engineer to determine the basis and amount of said claims, the Contractor shall furnish such further information or details so that the information or details are received by the Engineer no later than the fifteenth day after receipt of the written request from the Engineer. If the fifteenth day falls on a Saturday, Sunday or legal holiday, then receipt of such information or details by the Engineer shall not be later than close of business of the next business day. Failure to submit such information and details to the Engineer within the time specified will be sufficient cause for denying the claim.

The Contractor shall keep full and complete records of the costs and additional time incurred for any work for which a claim for additional compensation is made. The Engineer or any designated claim investigator or auditor shall have access to those records and any other records as may be required by the Engineer to determine the facts or contentions involved in the claims. Failure to permit access to such records shall be sufficient cause for denying the claims.

Claims submitted by the Contractor shall be accompanied by a notarized certificate containing the following language:

Under the penalty of law for perjury or falsification and with specific reference to the California False Claims Act, Government Code Section 12650 et. seq., the undersigned,

_____
(name)
_____ of
(title)
_____
(company)

hereby certifies that the claim for the additional compensation and time, if any, made herein for the work on this contract is a true statement of the actual costs incurred and time sought, and is fully documented and supported under the contract between parties.

Dated _____

/s/ _____

Subscribed and sworn before me this _____ day

of _____

_____
Notary Public
My Commission Expires _____

Failure to submit the notarized certificate will be sufficient cause for denying the claim.

Any claim for overhead type expenses or costs, in addition to being certified as stated above, shall be supported by an audit report of an independent Certified Public Accountant. Any such overhead claim shall also be subject to audit by the State at its discretion.

Any costs or expenses incurred by the State in reviewing or auditing any claims that are not supported by the Contractor's cost accounting or other records shall be deemed to be damages incurred by the State within the meaning of the California False Claims Act.

The District Director of the District which administers the contract will make the final determination of any claims which remain in dispute after completion of claim review by the Engineer. A board or person designated by said District Director will review such claims and make a written recommendation thereon to the District Director. The Contractor may meet with the review board or person to make a presentation in support of such claims.

Upon final determination of the claims, the Engineer will then make and issue his final estimate in writing and within 30 days thereafter the State will pay the entire sum, if any, found due thereon. Such final estimate shall be conclusive and binding against both parties to the contract on all questions relating to the amount of work done and the compensation payable therefor, except as otherwise provided in Sections 9-1.03C, "Records," and 9-1.09, "Clerical Errors."

5-1.09 INTEREST ON PAYMENTS

Interest shall be payable on progress payments, payments after acceptance, final payments, extra work payments and claim payments as follows:

1. Unpaid progress payments, payment after acceptance and final payments shall begin to accrue interest 30 days after the Engineer prepares the payment estimate.
2. Unpaid extra work bills shall begin to accrue interest 30 days after preparation of the first pay estimate following the receipt of a properly submitted and undisputed extra work bill. To be properly submitted, the bill must be submitted within 7 days of the performance of the extra work and in accordance with the requirements of Section 9-1.03C, "Records," and Section 9-1.06, "Partial Payments," of the Standard Specifications. An undisputed extra work bill not submitted within 7 days of performance of the extra work will begin to accrue interest 30 days after the preparation of the second pay estimate following submittal of the bill.
3. The rate of interest payable for unpaid progress payments, payments after acceptance, final payments and extra work payments shall be 10 percent per annum.
4. The rate of interest payable on a claim, protest or dispute ultimately allowed under this contract shall be 6 percent per annum. Interest shall begin to accrue 61 days after the Contractor submits to the Engineer information in sufficient detail to enable the Engineer to ascertain the basis and amount of said claim, protest or dispute.

The rate of interest payable on any award in arbitration shall be 6 percent per annum if allowed under the provisions of Civil Code Section 3289.

5-1.10 PUBLIC SAFETY

The Contractor shall provide for the safety of traffic and the public in accordance with the provisions in Section 7-1.09, "Public Safety," of the Standard Specifications and these special provisions.

The Contractor shall install temporary railing (Type K) between any lane carrying public traffic and any excavation, obstacle, or storage area when the following conditions exist:

(1) Excavations.--Any excavation, the near edge of which is 12 feet or less from the edge of the lane, except:

(a) Excavations covered with sheet steel or concrete covers of adequate thickness to prevent accidental entry by traffic or the public.
(b) Excavations less than one foot deep.
(c) Trenches less than one foot wide for irrigation pipe or electrical conduit, or excavations less than one foot in diameter.
(d) Excavations parallel to the lane for the purpose of pavement widening or reconstruction.
(e) Excavations in side slopes, where the slope is steeper than 4:1.
(f) Excavations protected by existing barrier or railing.

(2) Temporarily Unprotected Permanent Obstacles.--Whenever the work includes the installation of a fixed obstacle together with a protective system, such as a sign structure together with protective railing, and the Contractor elects to install the obstacle prior to installing the protective system; or whenever the Contractor, for his convenience and with permission of the Engineer, removes a portion of an existing protective railing at an obstacle and does not replace such railing complete in place during the same day.

(3) Storage Areas.--Whenever material or equipment is stored within 12 feet of the lane and such storage is not otherwise prohibited by the specifications.

The approach end of temporary railing (Type K), installed in accordance with the requirements in this section "Public Safety" and in Section 7-1.09, "Public Safety," of the Standard Specifications shall be offset a minimum of 15 feet from the edge of the traffic lane open to public traffic. The temporary railing shall be installed on a skew toward the edge of the traffic lane of not more than one foot transversely to 10 feet longitudinally with respect to the edge of the traffic lane. If the 15-foot minimum offset cannot be achieved, the temporary railing shall be installed on the 10 to 1 skew to obtain the maximum available offset between the approach end of the railing and the edge of the traffic lane, and an array of temporary crash cushion modules shall be installed at the approach end of the temporary railing.

Temporary railing (Type K) shall conform to the provisions in Section 12-3.08, "Temporary Railing (Type K)," of the Standard Specifications. Temporary railing (Type K), conforming to the details shown on 1995 Standard Plan T3 or 1997 Standard Plan T3, may be used. Temporary railing (Type K) fabricated prior to January 1, 1993, and conforming to 1988 Standard Plan B11-30 may be used, provided the fabrication date is printed on the required Certificate of Compliance.

The fourteenth paragraph of Section 12-3.08, "Temporary Railing (Type K)," of the Standard Specifications is amended to read:

> Each rail unit placed within 10 feet of a traffic lane shall have a reflector installed on top of the rail as directed by the Engineer. A Type P marker panel shall also be installed at each end of railing installed adjacent to a two-lane, two-way highway and at the end facing traffic of railing installed adjacent to a one-way roadbed. If the railing is placed on a skew, the marker shall be installed at the end of the skew nearest the traveled way. Type P marker panels shall conform to the provisions in Section 82, "Markers and Delineators," except that the Contractor shall furnish the marker panels.

Reflectors on temporary railing (Type K) shall conform to the provisions in "Prequalified and Tested Signing and Delineation Materials," of these special provisions.

Temporary crash cushion modules shall conform to the provisions in "Temporary Crash Cushion Module" elsewhere in these special provisions.

Except for installing, maintaining and removing traffic control devices, whenever work is performed or equipment is operated in the following work areas the Contractor shall close the adjacent traffic lane unless otherwise provided in the specifications:

Approach speed of public traffic (Posted Limit) (Miles Per Hour)	Work Areas
Over 45	Within 6 feet of a traffic lane but not on a traffic lane.
35 to 45	Within 3 feet of a traffic lane but not on a traffic lane.

The lane closure provisions of this section shall not apply if the work area is protected by permanent or temporary railing or barrier.

When traffic cones or delineators are used to delineate a temporary edge of traffic lane, the line of cones or delineators shall be considered to be the edge of traffic lane, however, the Contractor shall not reduce the width of an existing lane to less than 10 feet without written approval from the Engineer.

When work is not in progress on a trench or other excavation that required closure of an adjacent lane, the traffic cones or portable delineators used for the lane closure shall be placed off of and adjacent to the edge of the traveled way. The spacing of the cones or delineators shall be not more than the spacing used for the lane closure.

Suspended loads or equipment shall not be moved nor positioned over public traffic or pedestrians.

Full compensation for conforming to the requirements in this section "Public Safety," including furnishing and installing temporary railing (Type K) and temporary crash cushion modules, shall be considered as included in the contract prices paid for the various items of work involved and no additional compensation will be allowed therefor.

5-1.11 SURFACE MINING AND RECLAMATION ACT

Attention is directed to the Surface Mining and Reclamation Act of 1975, commencing in Public Resources Code, Mining and Geology, Section 2710, which establishes regulations pertinent to surface mining operations.

Material from mining operations furnished for this project shall only come from permitted sites in compliance with the Surface Mining and Reclamation Act of 1975.

The requirements of this section shall apply to all materials furnished for the project, except for acquisition of materials in conformance with Section 4-1.05, "Use of Materials Found on the Work," of the Standard Specifications.

5-1.12 REMOVAL OF ASBESTOS AND HAZARDOUS SUBSTANCES

When the presence of asbestos or hazardous substances are not shown on the plans or indicated in the specifications and the Contractor encounters materials which the Contractor reasonably believes to be asbestos or a hazardous substance as defined in Section 25914.1 of the Health and Safety Code, and the asbestos or hazardous substance has not been rendered harmless, the Contractor may continue work in unaffected areas reasonably believed to be safe, and shall immediately cease work in the affected area and report the condition to the Engineer in writing.

In accordance with Section 25914.1 of the Health and Safety Code, all such removal of asbestos or hazardous substances including any exploratory work to identify and determine the extent of such asbestos or hazardous substance will be performed by separate contract.

If delay of work in the area delays the current controlling operation, the delay will be considered a right of way delay and the Contractor will be compensated for such delay as provided in Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

5-1.13 FINAL PAY QUANTITIES

Section 9-1.015, "Final Pay Quantities," of the Standard Specifications is amended to read:

9-1.015 Final Pay Items.—When an item of work is designated as (F) or (S-F) in the Engineer's Estimate, the estimated quantity for that item of work shall be the final pay quantity, unless the dimensions of any portion of that item are revised by the Engineer, or the item or any portion of the item is eliminated. If the dimensions of any portion of the item are revised, and the revisions result in an increase or decrease in the estimated quantity of that item of work, the final pay quantity for the item will be revised in the amount represented by the changes in the dimensions, except as otherwise provided for minor structures in Section 51-1.22, "Measurement." If a final pay item is eliminated, the estimated quantity for the item will be eliminated. If a portion of a final pay item is eliminated, the final pay quantity will be revised in the amount represented by the eliminated portion of the item of work.

The estimated quantity for each item of work designated as (F) or (S-F) in the Engineer's Estimate shall be considered as approximate only, and no guarantee is made that the quantity which can be determined by computations, based on the details and dimensions shown on the plans, will equal the estimated quantity. No allowance will be made in the event that the quantity based on computations does not equal the estimated quantity.

In case of discrepancy between the quantity shown in the Engineer's Estimate for a final pay item and the quantity or summation of quantities for the same item shown on the plans, payment will be based on the quantity shown in the Engineer's Estimate.

5-1.14 YEAR 2000 COMPLIANCE

This contract is subject to Year 2000 Compliance for automated devices in the State of California. Year 2000 compliance is defined as follows:

Year 2000 compliance for automated devices in the State of California is achieved when embedded functions have or create no logical or mathematical inconsistencies when dealing with dates prior to and beyond 1999. The year 2000 is recognized and processed as a leap year. The product must also operate accurately in the manner in which it was intended for date operation without requiring manual intervention.

The Contractor shall provide the Engineer a Certificate of Compliance from the manufacturer in accordance with the provisions of Section 6-1.07, "Certificates of Compliance," of the Standard Specifications for all automated devices furnished for the project.

5-1.15 DVBE RECORDS

The Contractor shall maintain records of all subcontracts entered into with certified DVBE subcontractors and records of materials purchased from certified DVBE suppliers. The records shall show the name and business address of each DVBE subcontractor or vendor and the total dollar amount actually paid each DVBE subcontractor or vendor.

Upon completion of the contract, a summary of these records shall be prepared on Form CEM-2402 and certified correct by the Contractor or the Contractor's authorized representative, and shall be furnished to the Engineer.

5-1.155 PERFORMANCE OF DVBE SUBCONTRACTORS AND SUPPLIERS

The DVBEs listed by the Contractor in response to the requirements in Section 2-1.04, "Submission of DVBE Information," in these special provisions, which are determined by the Department to be certified DVBEs, shall perform the work and supply the materials for which they are listed unless the Contractor has received prior written authorization to perform the work with other forces or to obtain the materials from other sources.

Authorization to utilize other forces or sources of materials may be requested for the following reasons:

(1) The listed DVBE, after having had a reasonable opportunity to do so, fails or refuses to execute a written contract, when the written contract, based upon the general terms, conditions, plans and specifications for the project, or on the terms of the subcontractor's or supplier's written bid, is presented by the Contractor.
(2) The listed DVBE becomes bankrupt or insolvent.
(3) The listed DVBE fails or refuses to perform the subcontract or furnish the listed materials.
(4) The Contractor stipulated that a bond was a condition of executing a subcontract and the listed DVBE subcontractor fails or refuses to meet the bond requirements of the Contractor.
(5) The work performed by the listed subcontractor is substantially unsatisfactory and is not in substantial accordance with the plans and specifications, or the subcontractor is substantially delaying or disrupting the progress of the work.
(6) The listed DVBE subcontractor is not licensed pursuant to the Contractor's License Law.
(7) It would be in the best interest of the State.

The Contractor shall not be entitled to any payment for the work or material unless it is performed or supplied by the listed DVBE or by other forces (including those of the Contractor) pursuant to prior written authorization of the Engineer.

5-1.16 SUBCONTRACTING

Attention is directed to the provisions in Section 8-1.01, "Subcontracting," of the Standard Specifications, Section 2, "Proposal Requirements and Conditions," Section 2-1.04, \"Submission of DVBE Information,\" and Section 3, \"Award and Execution of Contract,\" elsewhere in these special provisions and these special provisions.

The second sentence in the third paragraph of said Section 8-1.01 is amended to read:

When items of work in the Engineer's Estimate are preceded by the letters (S) or (S-F), said items are designated as "Specialty Items."

Section 8-1.01 of the Standard Specifications is amended by adding the following before the sixth paragraph:

Pursuant to the provisions of Section 6109 of the Public Contract Code, the Contractor shall not perform work on a public works project with a subcontractor who is ineligible to perform work on the public works project pursuant to Section 1777.1 or 1777.7 of the Labor Code.

Pursuant to the provisions of Section 1777.1 of the Labor Code, the Labor Commissioner publishes and distributes a list of contractors ineligible to perform work as a subcontractor on a public works project. This list of debarred contractors is available from the Department of Industrial Relations web site at http://www.dir.ca.gov/dir/Labor_law/DLSE/Debar.html.

The DVBE information furnished under Section 2-1.04, \"Submission of DVBE Information,\" of these special provisions is in addition to the subcontractor information required to be furnished under said Section 8-1.01, "Subcontracting," and Section 2-1.054, "Required Listing of Proposed Subcontractors," of the Standard Specifications.

Section 10115 of the Public Contract Code requires the Department to implement provisions to establish a goal for Disabled Veteran Business Enterprise (DVBE) participation in highway contracts that are state funded. As a part of this requirement:

1. No substitution of a DVBE subcontractor shall be made at any time without the written consent of the Department, and
2. If a DVBE subcontractor is unable to perform successfully and is to be replaced, the Contractor will be required to make good faith efforts to replace the original DVBE subcontractor with another DVBE subcontractor.

The requirement in Section 2-1.02, "Disabled Veteran Business Enterprise (DVBE)," of these special provisions that DVBEs must be certified on the date bids are opened does not apply to DVBE substitutions after award of the contract.

5-1.17 PARTNERING

The State will promote the formation of a "Partnering" relationship with the Contractor in order to effectively complete the contract to the benefit of both parties. The purpose of this relationship will be to maintain cooperative communication and mutually resolve conflicts at the lowest possible management level.

The Contractor may request the formation of such a "Partnering" relationship by submitting a request in writing to the Engineer after approval of the contract. If the Contractor's request for "Partnering" is approved by the Engineer,

scheduling of a "Partnering" workshop, selecting the "Partnering" facilitator and workshop site, and other administrative details shall be as agreed to by both parties.

The costs involved in providing a facilitator and a workshop site will be borne equally by the State and the Contractor. The Contractor shall pay all compensation for the wages and expenses of the facilitator, and of the expenses for obtaining the workshop site. The State's share of such costs will be reimbursed to the Contractor in a change order written by the Engineer. Markups will not be added. All other costs associated with the "Partnering" relationship will be borne separately by the party incurring the costs.

The establishment of a "Partnering" relationship will not change or modify the terms and conditions of the contract and will not relieve either party of the legal requirements of the contract.

5-1.18 DISPUTES REVIEW BOARD

To assist in the resolution of disputes or potential claims arising out of the work of this project, a Disputes Review Board, hereinafter referred to as the "DRB", shall be established by the Engineer and Contractor cooperatively upon approval of the contract. The DRB is intended to assist the contract administrative claims resolution process as set forth in the provisions of Section 9-1.04, "Notice of Potential Claim," and Section 9-1.07B, "Final Payment and Claims," of the Standard Specifications, as amended elsewhere in these special provisions. The DRB shall not be considered to serve as a substitute for any requirements in the specifications in regard to filing of potential claims. The requirements and procedures established in this special provision shall be considered as an essential prerequisite to filing a claim, for arbitration or for litigation prior or subsequent to project completion.

The DRB shall be utilized when dispute or potential claim resolution at the job level is unsuccessful. The DRB shall function until the day of acceptance of the contract, at which time the work of the DRB will cease except for completion of unfinished dispute hearings and reports. After acceptance of the contract any disputes or potential claims that the Contractor wants to pursue that have not been settled, shall be stated or restated, by the Contractor, in response to the Proposed Final Estimate within the time limits provided in Section 9-1.07B, "Final Payment and Claims," of the Standard Specifications, as amended elsewhere in these special provisions. The State will review those claims in accordance with Section 9-1.07B, of the Standard Specifications, as amended. Following the completion of the State's administrative claims procedure, the Contractor may resort to arbitration as provided in Section 91.10, "Arbitration," of the Standard Specifications.

Disputes, as used in this section, shall include all differences of opinion, properly noticed as provided hereinafter, between the State and Contractor on matters related to the work and other subjects considered by the State or Contractor, or by both, to be of concern to the DRB on this project, except matters relating to Contractor, subcontractor or supplier claims not actionable against the State as specified in these special provisions. Whenever the term "dispute" or "disputes" is used herein, it shall be deemed to include potential claims as well as disputes.

The DRB shall serve as an advisory body to assist in the resolution of disputes between the State and the Contractor, hereinafter referred to as the "parties". The DRB shall consider disputes referred to it, and furnish written reports containing findings and recommendations pertaining to those disputes, to the parties to aid in resolution of the differences between them. DRB findings and recommendations are not binding on the parties.

The DRB shall consist of one member selected by the State, one member selected by the Contractor, and a third member selected by the first two members and approved by both the State and the Contractor. The third member shall act as DRB Chairperson.

The first two DRB members shall select a third DRB member subject to the mutual approval of the parties, or may mutually concur on a list of potentially acceptable third DRB members and submit the list to the parties for final selection and approval of the third member. The goal in selection of the third member is to complement the professional experience of the first two members, and to provide leadership for the DRB's activities.

No DRB member shall have prior direct involvement in this contract, and no member shall have a financial interest in this contract or the parties thereto, within a period of 6 months prior to award of this contract, or during the contract, except as follows:

1. Compensation for services on this DRB.
2. Ownership interest in a party or parties, documented by the prospective DRB member, that has been reviewed and determined in writing by the State to be sufficiently insignificant to render the prospective member acceptable to the State.
3. Service as a member of other Disputes Review Boards on other contracts.
4. Retirement payments or pensions received from a party that are not tied to, dependent on or affected by the net worth of the party.

5. The above provisions apply to any party having a financial interest in this contract; including but not limited to contractors, subcontractors, suppliers, consultants, and legal and business services.

DRB members shall be especially knowledgeable in the type of construction and contract documents potentially anticipated by the contract, and shall discharge their responsibilities impartially and as an independent body considering the facts and circumstances related to the matters under consideration, applicable laws and regulations, and the pertinent provisions of the contract.

The State and the Contractor shall select their respective DRB members, in accordance with the terms and conditions of the Disputes Review Board Agreement and these provisions, within 45 days of the approval of the contract. Each party shall provide written notification to the other of the name of their selected DRB member along with the prospective member's written disclosure statement.

Before their appointments are final, the first two prospective DRB members shall submit complete disclosure statements to both the State and the Contractor. The statement shall include a resume of the prospective member's experience, together with a declaration describing all past, present and anticipated or planned future relationships, including indirect relationships through the prospective member's primary or full-time employer, to this project and with all parties involved in this construction contract; including, but not limited to, any relevant subcontractors or suppliers to the parties, the parties' principals or the parties' counsel. The DRB members shall also include a full disclosure of close professional or personal relationships with all key members of all parties to the contract. Either the Contractor or the State may object to the others nominee and that person will not be selected for the DRB. No reason need be given for the first objection. Objections to subsequent nominees must be based on a specific breech or violation of nominee responsibilities under this specification. A different person shall then be nominated within 14 Days. The third DRB member shall supply a full disclosure statement to the first two DRB members and to the parties prior to appointment. Either party may reject any of the three prospective DRB members who fail to fully comply with all required employment and financial disclosure conditions of DRB membership as described in the Disputes Review Board Agreement and elsewhere herein. A copy of the Disputes Review Board Agreement is included in this special provision.

The first duty of the State and Contractor selected members of the DRB is to select and recommend prospective third member(s) to the parties for final selection and approval. The first two DRB members shall proceed with the selection of the third DRB member immediately upon receiving written notification from the State of their selection, and shall provide their recommendation simultaneously to the parties within 21 days of the notification.

An impasse shall be considered to have been reached if the parties are unable to approve a third member within 14 days of receipt of the recommendation of the first two DRB members, or if the first two members are unable to agree upon a recommendation within the 14 day time limit allowed in the preceding paragraph. In the event of an impasse in selection of the third DRB member, the State and the Contractor shall each propose three candidates for the third position. The parties shall select all candidates proposed under this paragraph from the current list of arbitrators certified by the Public Works Contract Arbitration Committee created by Article 7.2 (commencing with Section 10245) of the State Contract Act. The first two DRB members shall then select one of the 6 proposed candidates in a blind draw.

The Contractor, the State, and all three members of the DRB shall complete and adhere to the Disputes Review Board Agreement in administration of this DRB within 14 days of the parties' concurrence in the selection of the third member. The State authorizes the Engineer to execute and administer the terms of the Agreement. The person(s) designated by the Contractor as authorized to execute Contract Change Orders shall be authorized to execute and administer the terms of this agreement, or to delegate the authority in writing. The operation of the DRB shall be in conformance with the terms of the Disputes Review Board Agreement.

The State and the Contractor shall bear the costs and expenses of the DRB equally. Each DRB board member shall be compensated at an agreed rate of $1,000.00 per day if time spent per meeting, including all on-site time plus one hour of travel time, is greater than four hours. Each DRB board member shall be compensated at an agreed rate of $600.00 per day if time spent per meeting, including all on-site time plus one hour of travel time, is less than or equal to four hours. The agreed rates shall be considered full compensation for on-site time, travel expenses, transportation, lodging, time for travel and incidentals for each day, or portion thereof, that the DRB member is at an authorized DRB meeting. No additional compensation will be made for time spent by DRB members in review and research activities outside the official DRB meetings unless that time, (such as time spent evaluating and preparing recommendations on specific issues presented to the DRB), has been specifically agreed to in advance by the State and Contractor. Time away from the project, that has been specifically agreed to in advance by the parties, will be compensated at an agreed rate of $100.00 per hour. The agreed amount of $100.00 per hour shall include all incidentals including any expenses for telephone, fax and computer services. Members serving on more than one DRB, regardless of the number of meetings per day, shall not be paid more than the all inclusive rate per day or rate per hour for an individual project. The State will provide, at no cost to the Contractor, administrative services such as conference facilities and secretarial services to the DRB. These special

provisions and the Disputes Review Board Agreement state provisions for compensation and expenses of the DRB. All DRB members shall be compensated at the same daily and hourly rate. The Contractor shall make direct payments to each DRB member for their participation in authorized meetings and approved hourly rate charges from invoices submitted by each DRB member. The State will reimburse the Contractor for its share of the costs. There will be no markups applied to any expenses connected with the DRB, either by the DRB members or by the Contractor when requesting payment of the State's share of DRB expenses.

Service of a DRB member may be terminated at any time with not less than 14 days notice as follows:

1. The State may terminate service of the State appointed member.
2. The Contractor may terminate service of the Contractor appointed member.
3. Upon the written recommendation of the State and Contractor members for the removal of the third member.
4. Upon resignation of a member.

When a member of the DRB is replaced, the replacement member shall be appointed in the same manner as the replaced member was appointed. The appointment of a replacement DRB member will begin promptly upon determination of the need for replacement and shall be completed within 14 days. Changes in either of the DRB members chosen by the two parties will not require re-selection of the third member, unless both parties agree to such re-selection in writing. The Disputes Review Board Agreement shall be amended to reflect the change of a DRB member.

The following procedure shall be used for dispute resolution:

1. If the Contractor objects to any decision, act or order of the Engineer, the Contractor shall give written notice of potential claim as specified in Section 9-1.04, "Notice of Potential Claim," of the Standard Specifications, as amended elsewhere in these special provisions, including provision of applicable cost documentation; or file written protests or notices pursuant to Sections 4-1.03A, "Procedure and Protest", 8-1.06, "Time of Completion", 8-1.07, "Liquidated Damages", or 8-1.10, "Utility and Non-Highway Facilities" of the Standard Specifications.
2. The Engineer will respond, in writing, to the Contractor's written protest or notice within 14 days of receipt of the written protest or notice.
3. Within 14 days after receipt of the Engineer's written response, the Contractor shall, if the Contractor still objects, file a written reply with the Engineer, stating clearly and in detail the basis of the objection.
4. Following the Contractor's objection to the Engineer's decision, the Contractor shall refer the dispute to the DRB if the Contractor wishes to further pursue the objection to the Engineer’s decision. The Contractor shall make the referral in writing to the DRB, simultaneously copied to the State, within 21 days after receipt of the written reply from the Engineer. The written dispute referral shall describe the disputed matter in individual discrete segments so that it will be clear to both parties and the DRB what discrete elements of the dispute have been resolved, and which remain unresolved.
5. The Contractor, by failing to submit the written notice of referral of the matter to the DRB within 21 days after receipt of the State’s written reply, waives any future claims on the matter in contention.
6. The Contractor and the State shall each be afforded an opportunity to be present and to be heard by the DRB, and to offer evidence. Either party furnishing any written evidence or documentation to the DRB must furnish copies of such information to the other party a minimum of 14 days prior to the date the DRB is scheduled to convene the hearing for the dispute. Either party shall produce such additional evidence as the DRB may deem necessary to reach an understanding and determination of the dispute. The party furnishing additional evidence shall furnish copies of such additional evidence to the other party at the same time the evidence is provided to the DRB. The DRB will not consider any evidence not furnished in accordance with the terms specified herein.
7. The DRB shall furnish a report, containing findings and recommendations as described in the Disputes Review Board Agreement, in writing to both the State and the Contractor. The DRB shall complete its reports, including minority opinion if any, and submit them to the parties within 30 days of the DRB hearing, except that time extensions may be granted at the request of the DRB with the written concurrence of both parties. The report shall include the facts and circumstances related to the matters under consideration, applicable laws and regulations, the pertinent provisions of the Contract and the actual costs and time incurred as shown on the Contractor's cost accounting records.
8. Within 30 days after receiving the DRB's report, both the State and the Contractor shall respond to the DRB in writing signifying that the dispute is either resolved or remains unresolved. Failure to provide the written response within the time specified, or a written rejection of the DRB's recommendation presented in the report by either party, shall conclusively indicate that the party(s) failing to respond accepts the DRB recommendation. Immediately after responses have been received by both parties, the DRB will provide copies of both responses

to the parties simultaneously. Either party may request clarification of elements of the DRB's report from the DRB prior to responding to the report. The DRB will consider any clarification request only if submitted within 10 days of receipt of the DRB's report, and if submitted simultaneously in writing to both the DRB and the other party. Each party may submit only one request for clarification for any individual DRB report. The DRB shall respond, in writing, to requests for clarification within 10 days of receipt of such requests.

9. The DRB's recommendations, stated in the DRB's reports, are not binding on either party. Either party may seek a reconsideration of a recommendation of the DRB. The DRB shall only grant a reconsideration based upon submission of new evidence and if the request is submitted within the 30 day time limit specified for response to the DRB's written report. Each party may submit only one request for reconsideration regarding any individual DRB recommendation.
10. If the State and the Contractor are able to resolve their dispute with the aid of the DRB's report, the State and Contractor shall promptly accept and implement the recommendations of the DRB.
11. The State or the Contractor shall not call members who served on the DRB for this contract as witnesses in arbitration proceedings which may arise from this contract, and all documents created by the DRB shall be inadmissible as evidence in subsequent arbitration proceedings, except the DRB’s final written reports on each issue brought before it..
12. The State and Contractor shall jointly indemnify and hold harmless the DRB members from and against all claims, damages, losses, and expenses, including but not limited to attorney's fees, arising out of and resulting from the findings and recommendations of the DRB.
13. The DRB members shall have no claim against the State or the Contractor, or both, from any claimed harm arising out of the parties' evaluations of the DRB's report.

Disputes Involving Subcontractor Claims.—For purposes of this section, a "subcontractor claim" shall include any claim by a subcontractor (including also any pass through claims by a lower tier subcontractor or supplier) against the Contractor that is actionable by the Contractor against the Department which arises from the work, services, or materials provided or to be provided in connection with the contract. If the Contractor determines to pursue a dispute against the Department that includes a subcontractor claim, the dispute shall be processed and resolved in accordance with these special provisions and in accordance with the following:

1. The Contractor shall identify clearly in all submissions pursuant to this section, that portion of the dispute that involves a subcontractor claim or claims.
2. The Contractor shall include, as part of its submission pursuant to Step 4 above, a certification (False Claims Act Certification) by the subcontractor's or supplier's officer, partner, or authorized representative with authority to bind the subcontractor and with direct knowledge of the facts underlying the subcontractor claim. The Contractor also shall submit a certification that the subcontractor claim is acknowledged and forwarded by the Contractor. The form for these certifications are available from the Engineer.
3. At any DRB meeting on a dispute that includes one or more subcontractor claims, the Contractor shall require that each subcontractor that is involved in the dispute have present an authorized representative with actual knowledge of the facts underlying the subcontractor claim to assist in presenting the subcontractor claim and to answer questions raised by the DRB members or the Department's representatives.
4. Failure by the Contractor to declare a subcontractor claim on behalf of its subcontractor (including lower tier subcontractors' and suppliers' pass through claims) at the time of submission of the Contractor's claims, as provided hereunder, shall constitute a release of the Department by the Contractor on account of such subcontractor claim.
5. The Contractor shall include in all subcontracts under this contract that subcontractors and suppliers of any tier (a) agree to submit subcontractor claims to the Contractor in a proper form and in sufficient time to allow processing by the Contractor in accordance with the Dispute Review Board resolution specifications; (b) agree to be bound by the terms of the Dispute Review Board provisions to the extent applicable to subcontractor claims; (c) agree that, to the extent a subcontractor claim is involved, completion of all steps required under these Dispute Review Board special provisions shall be a condition precedent to pursuit by the subcontractor of any other remedies permitted by law, including without limitation of a lawsuit against the Contractor; and (d) agree that the existence of a dispute resolution process for disputes involving subcontractor claims shall not be deemed to create any claim, right, or cause of action by any subcontractor or supplier against the Department.

Notwithstanding the foregoing, this Dispute Review Board special provision shall not apply to, and the DRB shall not have the authority to consider, any subcontractor claim between the subcontractor(s) or supplier(s) and the Contractor that is not actionable by the Contractor against the Department.

A copy of the "Disputes Review Board Agreement" to be executed by the Contractor, State and the three DRB members after approval of the contract follows:

DISPUTES REVIEW BOARD AGREEMENT

_____
(Contract Identification)

Contract No. _____

THIS DISPUTES REVIEW BOARD AGREEMENT, hereinafter called "AGREEMENT", made and entered into this _____ day of _____, _____, between the State of California, acting through the California Department of Transportation and the Director of Transportation, hereinafter called the "STATE"; _____ hereinafter called the "CONTRACTOR"; and the Disputes Review Board, hereinafter called the "DRB" consisting of the following members:

_____ ,
(Contractor Appointee)

_____ ,
(State Appointee)

and _____
(Third Person)

WITNESSETH, that

WHEREAS, the STATE and the CONTRACTOR, hereinafter called the "parties", are now engaged in the construction on the State Highway project referenced above; and

WHEREAS the special provisions for the above referenced contract provides for the establishment and operation of the DRB to assist in resolving disputes; and

WHEREAS, the DRB is composed of three members, one selected by the STATE, one selected by the CONTRACTOR, and the third member selected by the other two members and approved by the parties;

NOW THEREFORE, in consideration of the terms, conditions, covenants, and performance contained herein, or attached and incorporated and made a part hereof, the STATE, the CONTRACTOR, and the DRB members hereto agree as follows:

I
DESCRIPTION OF WORK

To assist in the resolution of disputes between the parties, the contract provides for the establishment and the operation of the DRB. The intent of the DRB is to fairly and impartially consider disputes placed before it and provide written recommendations for resolution of these disputes to both parties. The members of this DRB shall perform the services necessary to participate in the DRB's actions as designated in Section II, Scope of Work.

II
SCOPE OF WORK

The scope of work of the DRB includes, but is not limited to, the following:

A. Objective

The principal objective of the DRB is to assist in the timely resolution of disputes between the parties arising from performance of this contract. It is not intended for either party to default on their normal responsibility to amicably and fairly settle their differences by indiscriminately assigning them to the DRB. It is intended that the mere existence of the DRB will encourage the parties to resolve disputes without resorting to this review procedure. But when a dispute which is serious enough to warrant the DRB's review does develop, the process for prompt and efficient action will be in place.

B. Procedures

The DRB shall render written reports on disputes between the parties arising from the construction contract. Prior to consideration of a dispute, the DRB shall establish rules and regulations that will govern the conduct of its business and reporting procedures in accordance with the requirements of the contract and the terms of this AGREEMENT. DRB recommendations, resulting from its consideration of a dispute, shall be furnished in writing to both parties. The recommendations shall be based on the pertinent contract provisions, and the facts and circumstances involved in the dispute. The recommendations shall find one responsible party in a dispute; shared or "jury" determinations shall not be rendered.

The DRB shall refrain from officially giving any advice or consulting services to anyone involved in the contract. The individual members shall act in a completely independent manner and while serving as members of the DRB shall have no consulting business connections with either party or its principals or attorneys or any other affiliates (subcontractors, suppliers, etc.) who have a beneficial interest in the contract.

During scheduled meetings of the DRB as well as during dispute hearings, DRB members shall refrain from expressing opinions on the merits of statements on matters under dispute or potential dispute. Opinions of DRB members expressed in private sessions shall be kept strictly confidential. Individual DRB members shall not meet with, or discuss contract issues with individual parties, except as directed by the DRB Chairperson. Any such discussions or meetings shall be disclosed to both parties. Any other discussions regarding the project between the DRB members and the parties shall be in the presence of all three members and both parties. Individual DRB members shall not undertake independent investigations of any kind pertaining to disputes or potential disputes, except with the knowledge of both parties and as expressly directed by the DRB Chairperson.

C. Construction Site Visits, Progress Meetings and Field Inspections

The DRB members shall visit the project site and meet with representatives of the parties to keep abreast of construction activities and to develop familiarity with the work in progress. All scheduled progress meetings shall be held at or near the job site. The DRB shall meet at least once at the start of the project, and at least once every six months thereafter. The frequency, exact time, and duration of additional site visits and progress meetings shall be as recommended by the DRB and approved by the parties consistent with the construction activities or matters under consideration and dispute. Each meeting shall consist of a round table discussion and a field inspection of the work being performed on the contract, if necessary. Each meeting shall be attended by representatives of both parties. The agenda shall generally be as follows:

1. Meeting opened by the DRB Chairperson.
2. Remarks by the STATE's representative.
3. A description by the CONTRACTOR's representative of work accomplished since the last meeting; the current schedule status of the work; and a forecast for the coming period.
4. An outline by the CONTRACTOR's representative of potential problems and a description of proposed solutions.
5. An outline by the STATE's representative of the status of the work as the STATE views it.
6. A brief description by the CONTRACTOR's or STATE's representative of potential claims or disputes which have surfaced since the last meeting.
7. A summary by the STATE's representative, the CONTRACTOR's representative, or the DRB of the status of past disputes and claims.

The STATE's representative will prepare minutes of all regular meetings and circulate them for revision and approval by all concerned.

The field inspection shall cover all active segments of the work, the DRB being accompanied by both parties' representatives. The field inspection may be waived upon mutual agreement of the parties.

D. DRB Consideration and Handling of Disputes

Upon receipt by the DRB of a written referral of a dispute, the DRB shall convene to review and consider the dispute. The DRB shall determine the time and location of DRB hearings, with due consideration for the needs and preferences of the parties while recognizing the paramount importance of speedy resolution of issues. If the matter is not urgent, it may be scheduled for the time of the next scheduled DRB visit to the project. For an urgent matter, and upon the request of either party, the DRB shall meet at its earliest convenience.

Normally, hearings shall be conducted at or near the project site. However, any location which would be more convenient and still provide all required facilities and access to necessary documentation shall be satisfactory.

Both parties shall be given the opportunity to present their evidence at these hearings. It is expressly understood that the DRB members are to act impartially and independently in the consideration of the contract provisions, and the facts and conditions surrounding any dispute presented by either party, and that the recommendations concerning any such dispute are advisory and nonbinding on the parties.

The DRB may request that written documentation and arguments from both parties be sent to each DRB member, through the DRB Chairperson, for review before the hearing begins. A party furnishing any written documentation to the DRB shall furnish copies of such information to the other party at the same time that such information is supplied to the DRB.

DRB hearings shall be informal. There shall be no testimony under oath or cross-examination. There shall be no reporting of the procedures by a shorthand reporter or by any electronic means. Documents and verbal statements shall be received by the DRB in accordance with acceptance standards established by the DRB. Said standards need not comply with prescribed legal laws of evidence.

The third DRB member shall act as Chairperson for dispute hearings and all other DRB activities. The parties shall have a representative at all hearings. Failure to attend a duly noticed meeting by either of the parties shall be conclusively considered by the DRB as indication that the non-attending party considers any written submittals as their entire and complete argument. The claimant shall discuss the dispute, followed by the other party. Each party shall then be allowed one or more rebuttals until all aspects of the dispute are thoroughly covered. DRB members may ask questions, seek clarification, or request further data from either of the parties. The DRB may request from either party documents or information that would assist the DRB in making its findings and recommendations including, but not limited to, documents used by the CONTRACTOR in preparing the bid for the project. A refusal by a party to provide information requested by the DRB may be considered by the DRB as an indication that the requested material would tend to disprove that party's position. Claims shall not necessarily be computed by merely subtracting bid price from the total cost of the affected work. However, if any claims are based on the "total cost method", then, to be considered by the DRB, they shall be supported by evidence furnished by the CONTRACTOR that (1) the nature of the dispute(s) makes it impossible or impracticable to determine cost impacts with a reasonable degree of accuracy, (2) the CONTRACTOR's bid estimate was realistic, (3) the CONTRACTOR's actual costs were reasonable, and (4) the CONTRACTOR was not responsible for the added expenses. As to any claims based on the CONTRACTOR's field or home office accounting records, those claims shall be supported by an audit report of an independent Certified Public Accountant unless the contract includes special provisions that provide for an alternative method to calculate unabsorbed home office overhead. Any of those claims shall also be subject to audit by the DRB with the concurrence of the parties. In large or complex cases, additional hearings may be necessary in order to consider all the evidence presented by both parties. All involved parties shall maintain the confidentiality of all documents and information, as provided in this AGREEMENT.

During dispute hearings, no DRB member shall express an opinion concerning the merit of any facet of the case. All DRB deliberations shall be conducted in private, with all interim individual views kept strictly confidential.

After hearings are concluded, the DRB shall meet in private and reach a conclusion supported by two or more members. Private sessions of the DRB may be held at a location other than the job site or by electronic conferencing as deemed appropriate, in order to expedite the process.

The DRB's findings and recommendations, along with discussion of reasons therefor, shall then be submitted as a written report to both parties. Recommendations shall be based on the pertinent contract provisions, applicable laws and regulations, and facts and circumstances related to the dispute. The report shall be thorough in discussing the facts considered, the contract language, law or regulation viewed by the DRB as pertinent to the issues, and the DRB's interpretation and philosophy in arriving at its conclusions and recommendations. The DRB's report shall stand on its own, without attachments or appendices. The DRB chairman shall complete and furnish a summary report to the DRB Program Manager, Construction Program, M.S. 44, P.O. Box 942874, Sacramento, CA 94274.

With prior written approval of both parties, the DRB may obtain technical services necessary to adequately review the disputes presented; including audit, geotechnical, schedule analysis and other services. The parties' technical staff may supply those services as appropriate. The cost of any technical services, as agreed to by the parties, shall be borne equally by the two parties as specified in an approved contract change order. The CONTRACTOR will not be entitled to markups for the payments made for these services.

The DRB shall resist submittal of incremental portions of information by either party, in the interest of making a fully-informed decision and recommendation.

The DRB shall make every effort to reach a unanimous decision. If this proves impossible, the dissenting member shall prepare a minority opinion, which shall be included in the DRB's report.

Although both parties should place weight upon the DRB's recommendations, they are not binding. Either party may appeal a recommendation to the DRB for reconsideration. However, reconsideration shall only be allowed when there is new evidence to present, and the DRB shall accept only one appeal from each party pertaining to any individual DRB recommendation. The DRB shall hear appeals in accordance with the terms described in the Section entitled "Disputes Review Board" in the special provisions.

E. DRB Member Replacement

Should the need arise to appoint a replacement DRB member, the replacement DRB member shall be appointed in the same manner as the original DRB members were appointed. The selection of a replacement DRB member shall begin promptly upon notification of the necessity for a replacement and shall be completed within 14 days. This AGREEMENT will be amended to indicate change in DRB membership.

III
CONTRACTOR RESPONSIBILITIES

The CONTRACTOR shall furnish to each DRB member one copy of all pertinent documents which are or may become necessary for the DRB to perform their function. Pertinent documents are any drawings or sketches, calculations, procedures, schedules, estimates, or other documents which are used in the performance of the work or in justifying or substantiating the CONTRACTOR's position. The CONTRACTOR shall also furnish a copy of such pertinent documents to the STATE, in accordance with the terms outlined in the special provisions.

IV
STATE RESPONSIBILITIES

The STATE will furnish the following services and items:

A. Contract Related Documents

The STATE will furnish to each DRB member one copy of Notice to Contractors and Special Provisions, Proposal and Contract, Plans, Standard Specifications, and Standard Plans, change orders, written instructions issued by the STATE to the CONTRACTOR, or other documents pertinent to any dispute that has been referred to the DRB and necessary for the DRB to perform its function.

B. Coordination and Services

The STATE, through the Engineer, will, in cooperation with the CONTRACTOR, coordinate the operations of the DRB. The Engineer will arrange or provide conference facilities at or near the project site and provide secretarial and copying services to the DRB without charge to the CONTRACTOR.

V
TIME FOR BEGINNING AND COMPLETION

Once established, the DRB shall be in operation until the day of acceptance of the contract. The DRB members shall not begin any work under the terms of this AGREEMENT until authorized in writing by the STATE.

VI
PAYMENT

A. All Inclusive Rate Payment

The STATE and the CONTRACTOR shall bear the costs and expenses of the DRB equally. Each DRB board member shall be compensated at an agreed rate of $1,000.00 per day if time spent per meeting, including all on-site time plus one hour of travel time, is greater than four hours. Each DRB board member shall be compensated at an agreed rate of $600.00 per day if time spent per meeting, including all on-site time plus one hour of travel time, is less than or equal to four hours. The agreed rates shall be considered full compensation for on-site time, travel expenses, transportation, lodging, time for travel and incidentals for each day, or portion thereof, that the DRB member is at an authorized DRB meeting. No additional compensation will be made for time spent by DRB members in review and research activities outside the official DRB meetings unless that time has been specifically agreed to in advance by the STATE and CONTRACTOR. Time away from the project, that has been specifically agreed to in advance by the parties, will be compensated at an agreed rate of $100.00 per hour. The agreed amount of $100.00 per hour shall include all incidentals including any expenses for telephone, fax and computer services. Members serving on more than one DRB, regardless of the number of meetings per day, shall not be paid more than the all inclusive rate per day or rate per hour for an individual project. The STATE will provide, at no cost to the CONTRACTOR, administrative services such as conference facilities and secretarial services to the DRB.

B. Payments

All DRB members shall be compensated at the same rate. The CONTRACTOR shall make direct payments to each DRB member for their participation in authorized meetings and approved hourly rate charges from invoices submitted by each DRB member. The STATE will reimburse the CONTRACTOR for its share of the costs of the DRB.

The DRB members may submit invoices to the CONTRACTOR for partial payment for work performed and services rendered for their participation in authorized meetings not more often than once per month during the progress of the work. The invoices shall be in a format approved by the parties and accompanied by a general description of activities performed during that billing period. Payment for any hourly fees, at the agreed rate, shall not be paid to a DRB member until the amount and extent of those fees are approved by the STATE and CONTRACTOR.

Invoices shall be accompanied by original supporting documents, which the CONTRACTOR shall include with the extra work billing when submitting for reimbursement of the STATE's share of cost from the STATE. The CONTRACTOR will be reimbursed for one-half of approved costs of the DRB. No markups will be added to the CONTRACTOR's payment.

C. Inspection of Costs Records

The DRB members and the CONTRACTOR shall keep available for inspection by representatives of the STATE and the United States, for a period of three years after final payment, the cost records and accounts pertaining to this AGREEMENT. If any litigation, claim, or audit arising out of, in connection with, or related to this contract is initiated before the expiration of the three-year period, the cost records and accounts shall be retained until such litigation, claim, or audit involving the records is completed.

VII
ASSIGNMENT OF TASKS OF WORK

The DRB members shall not assign any of the work of this AGREEMENT.

VIII
TERMINATION OF AGREEMENT, THE DRB, AND DRB MEMBERS

DRB members may resign from the DRB by providing not less than 14 days written notice of the resignation to the STATE and CONTRACTOR. DRB members may be terminated by their original appointing power, in accordance with the terms of the contract.

IX
LEGAL RELATIONS

The parties hereto mutually understand and agree that the DRB member in the performance of duties on the DRB, is acting in the capacity of an independent agent and not as an employee of either party.

No party to this AGREEMENT shall bear a greater responsibility for damages or personal injury than is normally provided by Federal or State of California Law.

Notwithstanding the provisions of this contract that require the CONTRACTOR to indemnify and hold harmless the STATE, the parties shall jointly indemnify and hold harmless the DRB members from and against all claims, damages, losses, and expenses, including but not limited to attorney's fees, arising out of and resulting from the findings and recommendations of the DRB.

X
CONFIDENTIALITY

The parties hereto mutually understand and agree that all documents and records provided by the parties in reference to issues brought before the DRB, which documents and records are marked "Confidential - for use by the DRB only", shall be kept in confidence and used only for the purpose of resolution of subject disputes, and for assisting in development of DRB findings and recommendations; that such documents and records will not be utilized or revealed to others, except to officials of the parties who are authorized to act on the subject disputes, for any purposes, during the life of the DRB. Upon termination of this AGREEMENT, said confidential documents and records, and all copies thereof, shall be returned to the parties who furnished them to the DRB. However, the parties understand that such documents shall be subsequently discoverable and admissible in court or arbitration proceedings unless a protective order has been obtained by the party seeking further confidentiality.

XI
DISPUTES

Any dispute between the parties hereto, including disputes between the DRB members and either party or both parties, arising out of the work or other terms of this AGREEMENT, which cannot be resolved by negotiation and mutual concurrence between the parties, or through the administrative process provided in the contract, shall be resolved by arbitration as provided in Section 9-1.10, "Arbitration," of the Standard Specifications.

XII
VENUE, APPLICABLE LAW, AND PERSONAL JURISDICTION

In the event that any party, including an individual member of the DRB, deems it necessary to institute arbitration proceedings to enforce any right or obligation under this AGREEMENT, the parties hereto agree that any such action shall be initiated in the Office of Administrative Hearings of the State of California. The parties hereto agree that all questions shall be resolved by arbitration by application of California law and that the parties to such arbitration shall have the right of appeal from such decisions to the Superior Court in accordance with the laws of the State of California. Venue for the arbitration shall be Sacramento or any other location as agreed to by the parties.

XIII
FEDERAL REVIEW AND REQUIREMENTS

On Federal-Aid contracts, the Federal Highway Administration shall have the right to review the work of the DRB in progress, except for any private meetings or deliberations of the DRB.

All other Federal requirements in this agreement shall only apply to Federal-Aid contracts.

XIV
CERTIFICATION OF THE CONTRACTOR, THE DRB MEMBERS, AND THE STATE

IN WITNESS WHEREOF, the parties hereto have executed this AGREEMENT as of the day and year first above written.

DRB MEMBER

By: _____

Title: _____

DRB MEMBER

By: _____

Title :_____

DRB MEMBER

By :_____

Title :_____

CONTRACTOR

By: _____

Title: _____

CALIFORNIA STATE DEPARTMENT
OF TRANSPORTATION

By: _____

Title: _____

5-1.19 FORCE ACCOUNT PAYMENT

The second, third and fourth paragraphs of Section 9-1.03A, "Work Performed by Contractor," of the Standard Specifications, shall not apply.

To the total of the direct costs computed as provided in Sections 9-1.03A(1), "Labor," 9-1.03A(2), "Materials," and 9-1.03A(3), "Equipment Rental," of the Standard Specifications, there will be added a markup of 25 percent to the cost of labor, 10 percent to the cost of materials, and 10 percent to the equipment rental.

The above markups, together with payments made for time related overhead pursuant to "Overhead" of these special provisions, shall constitute full compensation for all overhead costs for work performed on a force account basis. These overhead costs shall be deemed to include all items of expense not specifically designated as cost or equipment rental in Sections 9-1.03A(1), "Labor," 9-1.03A(2), "Materials," and 9-1.03A(3), "Equipment Rental," of the Standard Specifications. The total payment made as provided above and in the first paragraph of Section 9-1.03A, "Work Performed by Contractor," shall be deemed to be the actual cost of the work performed on a force account basis, and shall constitute full compensation therefor.

When extra work to be paid for on a force account basis is performed by a subcontractor, approved in accordance with the provisions in Section 8-1.01, “Subcontracting,” of the Standard Specifications, an additional markup of 5 percent will be added to the total cost of said extra work including all markups specified in this section "Force Account Payment". Said additional 5 percent markup shall reimburse the Contractor for additional administrative costs, and no other additional payment will be made by reason of performance of the extra work by a subcontractor.

5-1.20 OVERHEAD

The Contractor will be compensated for overhead in accordance with these special provisions.

Attention is directed to "Force Account Payment" and "Progress Schedule (Critical Path)" of these special provisions.

Section 9-1.08, "Adjustment of Overhead Costs," of the Standard Specifications shall not apply.

Time related overhead shall consist of those overhead costs, including field and home office overhead, that are in proportion to the time required to complete the work.

The quantity of time related overhead to be measured for payment will be the number of working days specified in "Beginning of Work, Time of Completion and Liquidated Damages" of these special provisions, adjusted only as a result of suspensions and adjustments of time which revise the current contract completion date and which are also any of the following:

1) suspensions of work ordered in accordance with Section 8-1.05, "Temporary Suspension of Work," of the Standard Specifications, except:

    a) suspensions ordered due to the failure on the part of the Contractor to carry out orders given, or to perform any provision of the contract; and
    b) suspensions ordered due to unsuitable weather conditions;

2) extensions of time granted by the State in accordance with the provisions of the fifth paragraph of Section 8-1.07, "Liquidated Damages," of the Standard Specifications; or
3) reductions in contract time set forth in approved contract change orders, in accordance with Section 4-1.03, "Changes," of the Standard Specifications.

The contract price paid for time related overhead shall include full compensation for time related overhead measured for payment as specified above, incurred by the Contractor and by any joint venture partner, subcontractor, supplier or other party associated with the Contractor.

No adjustment in compensation will be made for any increase or decrease in the quantities of time related overhead required, regardless of the reason for the increase or decrease. The provisions in Sections 4-1.03B, "Increased or Decreased Quantities" and 4-1.03C, "Changes in Character of the Work," of the Standard Specifications, shall not apply to time related overhead.

For progress payment purposes, the number of working days to be paid for time related overhead in each monthly estimate will be the number of working days specified above to be measured for payment that the Contractor performed work on the current controlling operation or operations as specified in Section 8-1.06, "Time of Completion," of the Standard Specifications and as shown on the approved base line schedule. Working days specified above to be measured for payment, on which the Contractor did not perform work on the controlling operation or operations will be measured and included for payment in the first estimate made in accordance with Section 9-1.07, "Payment After Acceptance," of the Standard Specifications.

Full compensation for overhead other than time related overhead measured and paid for as specified above, and other than overhead costs for extra work performed pursuant to Section 4-1.03D of the Standard Specifications, shall be considered as included in the various items of work and no additional compensation will be allowed therefor.

5-1.21 PAYMENTS

Attention is directed to Section 9-1.06, "Partial Payments," and 9-1.07, "Payment After Acceptance," of the Standard Specifications and these special provisions.

In determining the partial payments to be made to the Contractor, only the following listed materials will be considered for inclusion in said payment as materials furnished but not incorporated in the work:

Bar reinforcing steel
Structural steel
Miscellaneous metal, bridge

Plate steel for fabrication of structural steel, stored within the State of California, and fabricated elements for structural steel, fabricated and stored within the United States, will be eligible for partial payment if the Contractor furnishes evidence satisfactory to the Engineer that its storage is subject to or under the control of the Department and that it has been designated or fabricated specifically for this project and is of such character that is not adaptable to any other use.

5-1.22 SOUND CONTROL REQUIREMENTS

Sound control shall conform to the provisions in Section 7-1.01I, "Sound Control Requirements," of the Standard Specifications and these special provisions.

Within the City and County of San Francisco, the noise level from the Contractor's operations between the hours of 8:00 p.m. and 7:00 a.m. shall not exceed 86 dbA at a distance of 50 feet. Said noise level requirement shall apply to all equipment on the job or related to the job, including but not limited to trucks, transit mixers or transient equipment that may or may not be owned by the Contractor. The use of loud sound signals shall be avoided in favor of light warnings except those required by safety laws for the protection of personnel.

In addition to the above requirements, the Contractor shall conform to San Francisco Police Code Section 2907 and 2908 provisions and the following:

The requirement of Section 2907 shall not apply to impacted tools and equipment as stated in Section 2907c. Impacted tools and equipment include tools, machinery or equipment which can be driven by energy in any form other than manpower, including all types of rivet busters, chipping guns and impact wrenches.

The Contractor shall use sound absorbing materials at the point of generation of the noise, between the hours of 8:00 p.m. and 8:00 a.m., for all the work within the City and County of San Francisco. The Contractor shall also be

required to use sound absorbing materials at the point of generation of the noise at any other time when directed by the Engineer. The sound absorbing materials shall be capable of attenuating a minimum of 15dbA at the noise source.

The Contractor shall obtain a night noise permit for any work between the hours of 8:00 p.m. and 8:00 a.m., as specified in Section 2908 of the San Francisco Police Code. For other requirements and obtaining the permit, the Contractor can contact the Department of Public Works, Room 460, 875 Stevenson Street, San Francisco at (415) 554-5816.

Full compensation for conforming to the requirements of this section shall be considered as included in the prices paid for the various contract items of work involved and no additional compensation will be allowed therefor.

5-1.23 RELATIONS WITH U.S. COAST GUARD

The location of the existing bridge work is adjacent to and across a navigable channel which is under the jurisdiction of the U.S. Coast Guard, Eleventh District, Coast Guard Island, Building 50-6, Alameda, CA 94501-5100, telephone (510) 437-2984.

A copy of the U.S. Coast Guard permit may be obtained as provided in "Permits and Licenses" elsewhere in these special provisions.

The rules, regulations and conditions that may govern the Contractor's operations are included in a document entitled "Marine Safety Office San Francisco Bay Seismic Retrofit Checklist" which will be part of an "Information Handout" made available to the Contractor.

Attention is directed to Sections 7-1.01, “Laws To Be Observed,” and 7-1.11, “Preservation of Property,” of the Standard Specifications.

The Contractor shall comply with all requirements of the U. S. Coast Guard with regard to the manner in which he conducts his operations and disposes of material. Any restriction of the channel and all navigation and warning lights shall be in accordance with regulations and subject to the approval of the U. S. Coast Guard.

Should the Contractor during the progress of the work, sink, lose, or throw overboard any material, plant or machinery, which may be dangerous to or which will obstruct navigation, he shall forthwith recover or remove such obstruction. The Contractor shall give immediate notice to the proper authorities and if required shall mark or buoy such obstructions until they are removed.

The Contractor shall keep proper warning lights each night between the hours of sunset and sunrise upon all floating equipment and falsework connected with the work and upon all buoys which are of a size and in such location as to endanger or obstruct navigation.

All work shall be so conducted that the free navigation of the waterway shall not be interfered with and the present navigable depths and channel width shall not be impaired.

Full compensation for conforming to the requirements of the Permit shall be considered as included in the contract prices paid for the various items of work involved and no additional compensation will be allowed therefor.

5-1.24 RELATIONS WITH BAY CONSERVATION AND DEVELOPMENT COMMISSION

A Bay Conservation and Development Commission permit is applicable to this contract. The Contractor shall fully inform himself of the requirements of this permit as well as all rules, regulations and conditions that may govern his operations and shall conduct his operations accordingly.

A copy of the Bay Conservation and Development Commission permit may be obtained as provided in "Permits and Licenses" elsewhere in these special provisions.

Attention is directed to Sections 7-1.01, “Laws To Be Observed,” and 7-1.11, “Preservation of Property,” of the Standard Specifications.

Any modifications to the permit which are proposed by the Contractor shall be submitted in writing to the Engineer for transmittal to the Bay Conservation and Development Commission for their consideration.

When the Contractor is notified by the Engineer that a modification to the permit is under consideration, no work will be allowed which is inconsistent with the proposed modification until the Departments take action on the proposed modifications. Compensation for delay will be determined in accordance with Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

The provisions of this section shall be made a part of every subcontract executed pursuant to this contract.

Any modifications to the permit between the Departments of Transportation and Bay Conservation and Development Commission will be fully binding on the Contractor, and the provisions of this section shall be made a part of every subcontract executed pursuant to this contract.

Full compensation for conforming to the requirements of the Permit shall be considered as included in the contract prices paid for the various items of work involved and no additional compensation will be allowed therefor.

5-1.25 RELATIONS WITH CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD

The location of the San Francisco Bay Bridge is within an area controlled by the Regional Water Quality Control Board. Regional Water Quality Control Board Order No. 94-098 has been issued covering work to be performed under this contract. The Contractor shall fully inform himself of all rules, regulations and conditions that may govern his operations in said area and shall conduct his work accordingly.

Copies of the agreement may be obtained at the Department of Transportation, Plans and Bid Documents, Room 0200, Transportation Building, 1120 N Street, P.O. Box 942874, Sacramento, California 94274-0001, Telephone No. (916)654-4490, and are available for inspection at the office of the Toll Bridge Program Duty Senior at 111 Grand Avenue, Oakland California 94612, telephone number (510) 286-5549.

Attention is directed to Sections 7-1.11, "Preservation of Property," and 7-1.12, "Responsibility for Damage," of the Standard Specifications.

Attention is directed to Section 8-1.06, "Time of Completion," of the Standard Specifications. Days during which the Contractor's operations are restricted in the floodway by the requirements of this section, shall be considered to be nonworking days if these restrictions cause a delay in the current controlling operation or operations.

Any modifications to the permit which are proposed by the Contractor shall be submitted in writing to the Engineer for transmittal to the Regional Water Quality Control Board for their consideration.

When the Contractor is notified by the Engineer that a modification to the permit is under consideration, no work will be allowed on the proposed modification until the Department takes action on the proposed modification.

Any modifications to any agreement between the Departments of Transportation and the Regional Water Quality Control Board shall be fully binding on the Contractor, and the provisions of this section shall be made a part of every subcontract executed pursuant to this contract.

Full compensation for conforming to the requirements of this section shall be considered as included in the contract prices paid for the various contract items of work and no additional compensation will be allowed therefor.

5-1.26 INSURANCE

The Contractor shall carry Public Liability and Property Damage Liability Insurance at all times when work is being performed. Before beginning work, the Contractor shall provide the Engineer the name, address, and telephone number of the nearest claims adjusting office of the company which has issued his liability insurance.

In addition to the above mentioned insurance, the Contractor shall have the following at all times the work is being performed:

Comprehensive or Commercial General Liability insurance carrier satisfactory to the State to protect the Contractor and any subcontractor against loss from liability imposed by law or damages on account of destruction of property, including loss of use thereof, resulting from any act of commission or omission by the Contractor or any subcontractor. Said insurance shall have limits of not less than two million dollars ($2,000,000) each occurrence for Property Damage Liability.

The insurance policy shall provide thirty (30) days written notice of cancellation, non-renewal or reduction in coverage or limits to the State.

Should any of the required insurance be provided under a claims-made form, the Contractor and subcontractors shall maintain such coverage continuously throughout the duration of the contract and, without lapse, for a period of one year beyond the termination of the contract, so that if such occurrences during the contract give rise to claims made after expiration of the contract, such claims shall be covered by such claim-made policies.

Nothing herein contained shall be construed as limiting in any way the extent to which the Contractor or any subcontractor may be held responsible for payment of damages resulting from their operations.

The Contractor and subcontractors agree to indemnify, hold harmless and to defend, at their sole cost and expense, the State of California, their officers, employees, and agents, against all losses, claims, cost, damages and liabilities for damage to property of any kind whatsoever, whether the person or property of the Contractor, subcontractors, agents or employees, or third persons, arising out of, or alleged to arise out of, any occupation or use of the Premises or any activity carried on by or act or omission of the Contractor or subcontractors, their officers, employees, or agents.

5-1.27 AREAS FOR CONTRACTOR'S USE

No area is available within the contract limits for the exclusive use of the Contractor. However, temporary storage of equipment and materials on State property may be arranged with the Engineer, subject to the prior demands of State

maintenance forces and to all other contract requirements. Use of the Contractor's work areas and other State-owned property shall be at the Contractor's own risk, and the State shall not be held liable for any damage to or loss of materials or equipment located within such areas.

The Contractor shall remove all equipment, materials, and rubbish from the work areas and other State-owned property which he occupies and shall leave the areas in a presentable condition, in conformance with the provisions in Section 4-1.02, "Final Cleaning Up," of the Standard Specifications.

The Contractor shall secure at his own expense any area required for storage of plant, equipment and materials, or for other purposes if sufficient area is not available to him within the contract limits.

5-1.28 TRANSPORTATION FOR THE ENGINEER

The Engineer shall have safe access to the work during construction in accordance with the provisions in Section 5-1.08, "Inspection" of the Standard Specifications and these special provisions.

The Engineer and all authorized representatives of the State, acting within the scope of their duties in connection with the work under this contract, shall be permitted to ride as passengers, without charge on any boat operated by, or for, the Contractor for the transportation of personnel, equipment, or materials. It is agreed that such rides will be taken only on boats which are making trips in connection with the Contractor’s operations. Special trips solely for the benefit of the Engineer or other State representatives will not be required.

Full compensation for conforming to the requirements in this section shall be considered as included in the contract prices paid for the various items of work involved and no additional compensation will be allowed therefor.

5-1.29 UTILITIES

The Contractor shall make his own arrangements to obtain electrical power, water, compressed air and other utilities required for his operations and shall make and maintain the necessary service connections at his own expense. The Contractor shall not use any existing utilities on the bridge or within the contract limits, unless approved in writing by the Engineer.

5-1.30 USE OF EXISTING TRAVELER RAILS AND SCAFFOLDS

The Contractor shall not use the existing traveler scaffolds or other existing scaffolds.

Contractor’s scaffolds, platforms, or other access devices may be placed on the existing traveler rails, provided they carry only personnel and hand tools. The traveler rails shall not be used to support the Contractor’s formwork, to support protective covers where required, nor to hoist or transport structural steel or other materials. The design capacity for the traveler rails and their supports shall not be exceeded. Information for the existing design capacities for the traveler rails and their supports can be obtained at the Department of Transportation, District 04, 111 Grand Avenue, Room 10-400, Oakland, CA 94612, telephone no. (510) 286-1046. For the actual travelers, the Contractor may contact the Rigging Engineer for the San Francisco-Oakland Bay Bridge at the San Francisco-Oakland Bay Bridge Toll Plaza, telephone no. (510) 286-0675.

The Contractor may strengthen the existing traveler rails and supports to increase their design capacity. Any modifications to the existing traveler rails or supports shall be fully compatible with the existing traveler scaffolds and conform to the provisions in Section 7-1.11, "Preservation of Property" and Section 7-1.14, "Cooperation," in the Standard Specifications and these special provisions.

The Contractor shall submit to the Engineer working drawings and design calculations of the Contractor’s scaffold, platforms, other access devices to be supported on the existing traveler rails and any modifications to the existing traveler rails or supports. Such drawings and design calculations shall conform to the requirements in Section 5-1.02, "Plans and Working Drawings," of the Standard Specifications and be signed by an engineer who is registered as a Civil Engineer in the State of California. The number of sets of drawings and design calculations and times for review for the Contractor’s scaffold, platforms, or other access devices shall be the same as specified for falsework working drawings in Section 51-1.06A, "Falsework Design and Drawings," of the Standard Specifications.

Working drawings for any part of the Contractor's scaffold, platforms, or other access devices shall include stress sheets, anchor bolt layouts, shop details, erection and removal plans.

The drawings shall include descriptions and values of all loads, including construction equipment loads, and construction activities that require the existing traveler rails. Any modifications to the traveler rails or supports shall be designed in accordance with AASHTO Load Resistance Factor Design (LRFD) Bridge Design Specifications.

The Contractor shall notify the Engineer immediately of any existing damage to the traveler rails or supports prior to using the damaged portion of rail or support.

Scaffolds, platforms or any other devices supported on the existing traveler rails and installed by the Contractor shall be removed after completion of the work and shall remain the property of the Contractor.

5-1.31 SANITARY PROVISIONS

State sanitary facilities will not be available for use by the Contractor's employees.

5-1.32 BRIDGE TOLLS

Toll-free passage on the San Francisco-Oakland Bay Bridge will be granted only for cars, trucks and special construction equipment which are clearly marked on the exterior with the Contractor's identification and which are being operated by the Contractor exclusively for the project and for the purpose of transporting materials and workmen directly to and from the jobsite.

The Contractor shall make application to the Engineer in advance for toll-free passage. The Contractor will be held accountable for the proper use of all passes issued, and upon completion of the work, shall return all unused passes.

Attention is directed to Section 23302, "Evasion of Toll," of the Vehicle Code.

5-1.33 ACCESS TO JOBSITE

Prospective bidders may make arrangements to visit the jobsite by contacting the Officer Engineer, Toll Bridge Program, at telephone (510)286-5549.

Attention is directed to “Cooperation,” and to subsections “Closure Scheduling and Notification,” “Work Plan,” and “Contingency Plan” of Section “Maintaining Traffic,” elsewhere in these special provisions.

All access to the work from either the upper or lower deck of the bridge, which may be contemplated by the Contractor, will be subject to coordination with other contracts which may be in progress during this contract. The determination of which of the lanes will be closed for access to the work will be made in accordance with the provisions of “Maintaining Traffic”, subsections “Closure Scheduling and Notification”, “Work Plan” and “Contingency Plan”.

Nothing in these special provisions shall be construed as an expressed or implied guarantee that the Contractor shall have the right to close a specific lane for the purpose of accessing the work. The cost of providing access to the work from lane closures shall be considered as included in the price paid for the various contract items of work affected by this section and no additional compensation will be allowed therefor.

For marine access see "Marine Access to the Jobsite" elsewhere in the special provisions.

5-1.34 DRAWINGS

Attention is directed to Section 5-1.02, "Plans and Working Drawings," of the Standard Specifications and these special provisions.

When working drawings are required by these special provisions the drawings shall be submitted in accordance with the provisions specified elsewhere in these special provisions and the following:

At the completion of the contract, one set of all approved final working drawings in electronic form, including any revisions required after approval, shall be furnished to the Engineer.

Electronic files of working drawings shall be Microstation Version 5.0 or later design file format and shall be submitted on compact disk media.

An index prepared specifically for the working drawings for each portion of the work which requires working drawings, containing sheet numbers and titles shall be included on the compact disk media. Electronic files for working drawings shall be arranged in the order of drawing numbers shown in the index.

5-1.35 PERMITS AND LICENSES

Attention is directed to Section 7-1.04, "Permits and Licenses," of the Standard Specifications and these special provisions.

The Department has obtained the following permits for this project:

San Francisco Bay Conservation Development Commission
U.S. Coast Guard
Regional Water Quality Control Board

The Contractor shall maintain a copy of the permits at the construction site and shall make the permits available to operating personnel during construction activities.

Copies of these permits can be obtained at the Department of Transportation, Plans and Bid Documents, Room 0200, Transportation Building, 1120 N Street, Sacramento, California 95814, or may be seen at the office of the Toll Bridge Duty Senior at 111 Grand Avenue, Oakland, CA 94612, telephone no. (510) 286-5549.

Full compensation for conforming to the requirements in these permits shall be considered as included in the contract prices paid for the various items of work and no additional compensation will be allowed therefor.

5-1.36 NAVIGATION REQUIREMENTS

The proposed work is located in navigable waters that are under the regulatory jurisdiction of the United States Coast Guard (USCG). The Contractor shall conduct operations in accordance with the requirements of the USCG as provided elsewhere in these special provisions.

Work shall be such that free navigation of the waterway, navigable depths and channel widths are not impaired, except as otherwise allowed by the USCG.

When working on, adjacent to or affecting navigable waters, the Contractor shall provide and monitor not less than one marine radiotelephone capable of transmitting and receiving on Channels 13 and 16, and shall provide maintain and operate such lights, signals and other warning devices as may be required by the District Commandant of the USCG.

The Contractor shall provide the name and telephone number of the project superintendent to the USCG Bridge Section, Building 10, Room 214, Coast Guard Island, Alameda, CA 94501 5100, (415)437-3514.

The Contractor shall notify the Engineer, in writing, not less than 15 days prior to performing any work within, adjacent to or affecting the navigable waters.

Working drawings complete with location plans, proposed methods of construction and schedules of operations within, adjacent to and affecting navigable waters insofar as the details affect the character of the finished work and for compliance with the regulations of the USCG shall be submitted to the Engineer for approval.

The submittals shall include, but not be limited to, size and location of equipment, anchoring, buoys, warning devices, lights and any other equipment or information required by the Engineer.

Attention is directed to Section 5-1.02, “Plans and Working Drawings,” of the Standard Specifications.

Approval of the working drawings by the Engineer will be contingent upon the drawings being satisfactory to the USCG. Work shall not start until the Engineer has reviewed and approved the drawings.

The Contractor shall allow three weeks after complete drawings and all support data are submitted for the Engineer’s review and approval.

Should the Engineer fail to complete his review within the time allowance and if, in the opinion of the Engineer, the Contractor's controlling operation is delayed or interfered with by reason of the delay in review, an extension of time commensurate with the delay in completion of the work thus caused will be granted as provided in Section 8-1.07, “Liquidated Damages.”

The Contractor may revise approved drawings provided sufficient time is allowed for the Engineer's review and approval before construction is started on the revised portions. Such additional time will not be more than that which was originally allowed.

Should the Contractor during the progress of the work sink, lose, or throw overboard any material, plant, machinery or floatable debris which may be dangerous to or which will obstruct navigation. The Contractor shall give immediate notice to the proper authorities and, if required, shall mark or buoy such obstructions until they can be removed. Should he neglect or delay compliance with the above requirements, such obstructions shall be removed by the State and the cost of such removal will be deducted from any monies due to the Contractor or may be recovered under his bond.

Full compensation for conforming to the requirements of this section shall be considered as included in the prices paid for the various contract items of work to which such drawings relate and no additional compensation will be allowed therefor.

5-1.37 LOADS ON EXISTING STRUCTURES

Anchoring to the bottom of the San Francisco Bay will not be permitted. No lines for anchoring equipment shall be attached to the existing structure except with prior written approval of the Engineer. Such approval, if granted, shall in no way relieve the Contractor of his responsibility for preservation of property as specified in Section 7-1.11, “Preservation of Property,” of the Standard Specifications. Attention is directed to “Navigation Requirements” elsewhere in these special provisions.

5-1.38 TIDAL CONDITIONS AND ELEVATION DATUM

Attention is directed to Section 2-1.03, "Examination of Plans, Specifications, Contract, and Site of Work," of the Standard Specifications.

Tidal conditions may present significant problems in constructing the work as shown in the plans. Tidal fluctuations may be severe and different from those shown in published tidal and current data due to differences in datum, winter runoff and other causes. Strong currents exist within portions of the project limits. Limited time periods of slack water may restrict diving and other underwater activities.

The Contractor is responsible for being knowledgeable of such tidal difficulties, and no payment will be made by the State for any costs incurred by the Contractor in connection with the variations in actual tidal or current conditions during the course of this contract. Any reference to Mean Higher High and Mean Lower Low tides shall be understood to be an estimate used for permit purposes, actual mean tide data shall be determined by the Contractor.

All vertical control data are based on the National Geodetic Vertical Datum of 1929.

5-1.39 COST REDUCTION INCENTIVE

Section 5-1.14, "Cost Reduction Incentive," of the Standard Specifications is amended by adding the following paragraph:

> Prior to preparing a cost reduction proposal, the Contractor shall request a meeting with the Engineer to discuss the proposal in concept and determine whether the cost reduction proposal will be considered by the Department. Items of discussion will also include permit issues, impact on other projects, impact on the project schedule, traffic considerations, safety and health issues, design criteria, and review times required by the Department and other agencies. Determination by the Engineer that a cost reduction proposal will not be considered further will be deemed rejection of the proposal.

SECTION 6. (BLANK)

SECTION 7. (BLANK)

SECTION 8. MATERIALS

SECTION 8-1. MISCELLANEOUS

8-1.01 PREQUALIFIED AND TESTED SIGNING AND DELINEATION MATERIALS

The Department maintains a trade name list of approved prequalified and tested signing and delineation materials and products. Approval of prequalified and tested products and materials shall not preclude the Engineer from sampling and testing of the signing and delineation materials or products at any time.

None of the listed signing and delineation materials and products shall be used in the work unless material or product is listed on the Department's List of Approved Traffic Products. A Certificate of Compliance shall be furnished as specified in Section 6-1.07, "Certificates of Compliance," of the Standard Specifications for signing and delineation materials and products. The certificate shall also certify that the signing and delineation material or product conforms to the prequalified testing and approval of the Department of Transportation, Division of Traffic Operations and was manufactured in conformance with the requirements in the approved quality control program.

Materials and products will be considered for addition to the approved prequalified and tested list if the manufacturer of the material or product submits to the Division of Traffic Operations a sample of the material or product. The sample shall be sufficient to permit performance of required tests. Approval of materials or products will be dependent upon a determination as to compliance with the specifications and test the Department may elect to perform.

The following is a listing of approved prequalified and tested signing and delineation materials and products:

PAVEMENT MARKERS, PERMANENT TYPE

REFLECTIVE

Apex, Model 921 (4"x4")
Pavement Markers, Inc., "Hye-Lite" (4"x4")
Ray-O-Lite, Models SS (4"x4"), RS (4"x4") and AA (4"x4")
Stimsonite, Models 88 (4" x4"), 911 (4"x4"), 953 (2.75"x4.5")
Ray-O-Lite, Model 2002 (2.2"x4.7")*

Stimsonite, Model 948 (2.3"x4.7")*

* Not to be used on asphalt concrete surfaces in desert regions as determined by the Engineer

REFLECTIVE WITH ABRASION RESISTANT SURFACE (ARS)

Ray-O-Lite "AA" ARS (4"x4")
Stimsonite, Models 911 (4"x4"), 953 (2.75"x4.5")
Ray-O-Lite, Model 2002 (2.2"x4.7")*
Stimsonite, Model 948 (2.3"x4.7")*

* Not to be used on asphalt concrete surfaces in desert regions as determined by the Engineer

REFLECTIVE WITH ABRASION RESISTANT SURFACE (ARS)
(Used for recessed applications)

Stimsonite, Model 948 (2.3"x4.7")
Ray-O-Lite, Model 2002 (2.2"x4.7")
Stimsonite, Model 944SB (2"x4")*
Ray-O-Lite, Model 2004 ARS (2"x4")*

* For use only in 4.5-inch wide (older) recessed slots

NON-REFLECTIVE FOR USE WITH EPOXY ADHESIVE

Apex Universal (Ceramic)
Highway Ceramics, Inc. (Ceramic)

NON-REFLECTIVE FOR USE WITH BITUMEN ADHESIVE

Apex Universal (Ceramic)
Apex Universal, Model 929 (ABS)
Elgin Molded Plastics, "Empco-Lite" Model 900 (ABS)
Highway Ceramics, Inc. (Ceramic)
Hi-Way Safety, Inc., Models P20-2000W and 2001Y (ABS)
Interstate Sales, "Diamond Back" (ABS)
Loomis Plastics, D-Dot (ABS)
Pavement Markers, Inc., (Marker Supply) - Models A1107 and AY1108 (ABS)
Road Creations, Model RCB4NR (Acrylic)

PAVEMENT MARKERS, TEMPORARY TYPE

TEMPORARY MARKERS FOR LONG TERM DAY/NIGHT USE (6 months or less)

Apex Universal, Model 924 (4"x4")
Davidson Plastics, Model 3.0 (4"x4")
Elgin Molded Plastics, "Empco-Lite" Model 901 (4" Round)
Highway Technologies, Megalites (4"x4")
Road Creations, Model R41C (4"x4")
Vega Molded Products "Temporary Road Marker" (3"x4")

TEMPORARY MARKERS FOR SHORT TERM DAY/NIGHT USE (14 days or less)
(For seal coat or chip seal applications, clear protective covers are required)

Apex Universal, Model 932
Davidson Plastics, Models T.O.M.,T.R.P.M. and "HH" (High Heat)

Hi-Way Safety, Inc., Model 1280/1281

STRIPING AND PAVEMENT MARKING MATERIALS

PERMANENT TRAFFIC STRIPING AND PAVEMENT MARKING TAPE

Advanced Traffic Marking, Series 300 and 400
Brite-Line, Series 1000
Swarco Industries, "Director 35" (For transverse application only)
Swarco Industries, "Director 60"
3M, "Stamark" Series 380 and 5730
3M, "Stamark" Series A320 Bisymetric (For use on low-volume roadways only)
3M, "Stamark" Series A420, A440, N420 and N440 (For transverse application only)

TEMPORARY REMOVABLE STRIPING AND PAVEMENT MARKING TAPE
(6 months or less)

Advanced Traffic Marking, ATM Series 200
Brite-Line, Series 100
P.B. Laminations, Aztec, Grade 102
Swarco Industries, "Director-2"
3M, "Stamark" Brand, Detour Grade, Series 5710 and Series A620

PREFORMED THERMOPLASTIC (Heated in place)

Flint Trading, "Premark" and "Premark 20/20 Flex"
Pavemark, "Hotape"

REMOVABLE TRAFFIC PAINT

Belpro, Series 250/252 and No. 93 Remover

CLASS 1 DELINEATORS

ONE-PIECE DRIVEABLE FLEXIBLE TYPE, 66"

Carsonite, Curve-Flex CFRM-400
Carsonite, Roadmarker CRM-375
Davidson Plastics, "Flexi-Guide Models 400 and 566"
GreenLine Model HWD1-66 and CGD1-66
J. Miller Industries, Model JMI-375 (with soil anchor)

SPECIAL USE FLEXIBLE TYPE, 48"

Carsonite, "Survivor" with 18" U-Channel anchor
FlexStake
GreenLine Models HWD and CGD (with 18" soil anchor)
Safe-Hit with 8" pavement anchor (SH248-GP1)
Safe-Hit with 15" soil anchor (SH248-GP2) and with 18" soil anchor (SH248-GP3)

SURFACE MOUNT FLEXIBLE TYPE, 48"

Bent Manufacturing Co., "Masterflex" Model MF-180EX-48"
Carsonite, "Super Duck II"
FlexStake, Surface Mount

CHANNELIZERS

SURFACE MOUNT TYPE, 36"

Bent Manufacturing Co., "Masterflex" Models MF-360-36(Round) and MF-180-36(Flat)
Carsonite, "Super Duck" (Flat SDF-436, Round SDR-336)
Carsonite, Super Duck II Model SDCF203601MB "The Channelizer"
Davidson Plastics, Flex-Guide FG300
FlexStake, Surface Mount
GreenLine, Model SMD-36
The Line Connection, "Dura-Post" Model DP36-3 (Permanent)
The Line Connection, "Dura-Post" Model DP36-3C (Temporary)
Repo, Models 300 and 400
Safe-Hit, Guide Post, Model SH236SMA

OBJECT MARKERS

TYPE "K", 18"

Carsonite, Model SMD-615
Repo, Models 300 and 400
Safe-Hit, Model SH718SMA
The Line Connection, Model DP21-4K

TYPE "K-4", 18"-24"
(Shown as "Q" in the Traffic Manual)

Carsonite, Super Duck II
Repo, Models 300 and 400
Safe-Hit, Models SH824SMA--WA and SH824GP3--WA
The Line Connection, Model "DP21-4Q"

TEMPORARY RAILING (TYPE K) REFLECTORS AND CONCRETE BARRIER MARKERS

IMPACTABLE TYPE

Astro Optics "FB"
Davidson Plastics, Model PCBM-12
Duraflex Corp., "Flexx 2020" and "Electriflexx"

NON-IMPACTABLE TYPE

Astro-Optics, JD Series
Stimsonite, Model 967 (with 3 1/4" Acrylic cube corner reflector)
Stimsonite, Model 967LS
Vega Molded Products, Models GBM and JD

THRIE BEAM BARRIER MARKERS (For use to the left of traffic)

Duraflex Corp., "Railrider"
Davidson Plastics, "Mini" (3"x10")

CONCRETE BARRIER DELINEATORS, 16"
(For use to the right of traffic. When mounted on top of barrier, top of reflective element at 48")

Davidson Plastics, Model PCBM T-16

Safe-Hit, Model SH216RBM

SOUND WALL DELINEATOR
(Applied to a vertical surface. Top of reflective element at 48")

Davidson Plastics, PCBM S-36

GUARD RAILING DELINEATOR
(For use to the right or left of traffic. Top of reflective element at 48")

WOOD POST TYPE

Carsonite, Model 427
Davidson Plastics FG 427 and FG 527
GreenLine GRD 27-inch
J. Miller Model JMI-375G
Safe-Hit, Model SH227GRD

STEEL POST TYPE

Carsonite, Model CFGR-327 with CFGRBK300 Mounting Bracket

REFLECTIVE SHEETING

CHANNELIZERS, BARRIER MARKERS AND DELINEATORS

3M, High Intensity
Reflexite, PC-1000, Metalized Polycarbonate
Reflexite, AC-1000, Acrylic
Reflexite, AP-1000, Metalized Polyester
Reflexite, AR-1000, Abrasion Resistant Coating)
Stimsonite, Series 6200 (For rigid substrate devices only)

TRAFFIC CONES, 13" Sleeves

Reflexite SB (Polyester), Vinyl or "TR" (Semi-transparent)

TRAFFIC CONES, 4" and 6" Sleeves

3M Series 3840
Reflexite Vinyl or "TR" (Semi-transparent)

BARRELS AND DRUMS

Reflexite, "Super High Intensity"
3M Series 3810

BARRICADES, Type I, Engineer Grade

American Decal, Adcolite
Avery Dennison, 1500/1600
3M, Scotchlite, Series CW

SIGNS, Type II, Super Engineer Grade

Avery Dennison, "Fasign" 2500 Series

Kiwalite, Type II
Nikkalite 1800 Series

SIGNS, Type III, High Performance

3M, Series 3780

SIGNS, Type IV, High Performance

Stimsonite Series 6200

SIGNS, Roll-Up Signs

Reflexite, Vinyl (Orange), Reflexite "SuperBright" (Fluorescent orange)
3M Series RS34 (Orange) and RS20 (Fluorescent orange)

SIGN SUBSTRATE FOR CONSTRUCTION AREA SIGNS

ALUMINUM

FIBERGLASS REINFORCED PLASTIC (FRP)

Sequentia, "Polyplate"
Fiber-Brite

8-1.02 STATE-FURNISHED MATERIALS

Attention is directed to Section 6-1.02, "State-Furnished Materials," of the Standard Specifications and these special provisions.

The following materials will be furnished to the Contractor:

Flasher unit
Seismic sensor accessories

SECTION 8-2. CONCRETE

8-2.01 PORTLAND CEMENT CONCRETE

Portland cement concrete shall conform to the provisions in Section 90, "Portland Cement Concrete," of the Standard Specifications and these special provisions.

Wherever the word "cement" is used in the Standard Specifications or the special provisions, and its use conforms to one of the following criteria, it shall be understood to mean "cementitious material":

A. When the cement content of portland cement concrete is specified and Section 90, "Portland Cement Concrete," of the Standard Specifications is referenced.
B. When the pounds of cement per cubic yard for portland cement concrete is specified and Section 90, "Portland Cement Concrete," of the Standard Specifications is referenced.

The above criteria shall not apply when the use of mineral admixture is not allowed.

Cementitious material to be used in portland cement concrete shall be a combination of "Type II Modified" portland cement and mineral admixture.

Section 90-1.01, "Description," of the Standard Specifications is amended to read:

90-1.01 Description.—Portland cement concrete shall be composed of cementitious material, fine aggregate, coarse aggregate, admixtures if used, and water, proportioned and mixed as specified in these specifications.

Unless otherwise specified, cementitious material to be used in portland cement concrete shall conform to the requirements for cement and mineral admixtures in Section 90-2, "Materials" and shall be either: 1) "Type IP (MS) Modified" cement; or 2) a combination of "Type II Modified" portland cement and mineral admixture.

Unless otherwise specified for precast, steam cured, or other high early strength concrete, mineral admixture will not be required if it has been determined by the Transportation Laboratory and documented in writing by the Engineer that the aggregate is from a source that is not alkali silica reactive.

Concrete for each portion of the work shall comply with the requirements for the Class, cementitious material content in pounds per cubic yard, 28-day compressive strength, minor concrete, or commercial quality concrete, as shown on the plans or specified in these specifications or the special provisions.

Class A concrete shall contain not less than 564 pounds of cementitious material per cubic yard.

Class B concrete shall contain not less than 470 pounds of cementitious material per cubic *yard.

Class C concrete shall contain not less than 376 pounds of cementitious material per cubic yard.

Class D concrete shall contain not less than 658 pounds of cementitious material per cubic yard.

Minor concrete shall contain not less than 564 pounds of cementitious material per cubic yard unless otherwise specified in these specifications or the special provisions.

Unless otherwise designated on the plans or specified in these specifications or the special provisions, the amount of cementitious material used per cubic yard of concrete in structures or portions of structures shall conform to the following:

Use	Cementitious Material Content in pounds
Concrete which is designated by compressive strength:	
Deck slabs and slab spans of bridges	658 min., 800 max.
Roof sections of exposed top box culverts	658 min., 800 max.
Other portions of structures	564 min., 800 max.
Concrete not designated by compressive strength:	
Deck slabs and slab spans of bridges	658 min.
Roof sections of exposed top box culverts	658 min.
Prestressed members	658 min.
Seal courses	658 min.
Other portions of structures	564 min.

Whenever the 28-day compressive strength shown on the plans is 3,500 pounds per square inch or greater, the concrete shall be considered to be designated by compressive strength. If the plans show a 28-day compressive strength which is 4,500 pounds per square inch or greater, an additional 7 days will be allowed to obtain the specified strength. The 28-day compressive strengths shown on the plans which are less than 3,500 pounds per square inch, are shown for design information only and are not to be considered a requirement for acceptance of the concrete.

Concrete designated by compressive strength shall be proportioned such that the concrete will conform to the strength shown on the plans or specified in the special provisions.

The Contractor shall determine the mix proportions for all concrete except pavement concrete. The Engineer will determine the mix proportions for pavement concrete.

Before using concrete for which the mix proportions have been determined by the Contractor, or in advance of revising those mix proportions, the Contractor shall submit in writing to the Engineer a copy of the mix design.

Compliance with cementitious material content requirements will be verified in accordance with procedures described in California Test 518 for cement content. For testing purposes, mineral admixture shall be considered to be cement. Batch proportions shall be adjusted as necessary to produce concrete having the specified cementitious material content.

If any concrete used in the work has a cementitious material content, consisting of cement,-mineral admixture, or cement plus mineral admixture, which is less than the minimum required for the work, the concrete shall be removed. However, if the Engineer determines that the concrete is structurally adequate, the concrete may remain in place and the Contractor shall pay to the State $0.25 for each pound of cement, mineral admixture, or cement plus mineral admixture which is less than the minimum required for the work. The Department may deduct the amount from any monies due, or that may become due, the Contractor under the contract. The deductions will not be made unless the difference between the contents required and those actually provided exceeds the batching tolerances permitted by Section 90-5, "Proportioning." No deductions for cementitious material content will be made based on the results of California Test 518.

The requirements of the preceding paragraph shall not apply to minor concrete nor commercial quality concrete.

All concrete for which the mix proportions are determined either by the Contractor or the Engineer shall conform to the requirements of this Section 90.

Portland cement shall be "Type II Modified" portland cement.

The first paragraph in Section 90-2.01, "Portland Cement," of the Standard Specifications is amended to read:

90-2.01 Portland Cement.—Unless otherwise specified, portland cement shall be either "Type IP (MS) Modified" cement or "Type II Modified" portland cement.

"Type IP (MS) Modified" cement shall conform to the specifications for Type IP (MS) cement in ASTM Designation: C 595, and shall be comprised of an intimate mixture of Type II cement and not more than 25 percent of a mineral admixture. The type and minimum amount of mineral admixture used in the manufacture of "Type IP (MS) Modified" cement shall be in accordance with the provisions of Section 90-4.08, "Required Use of Mineral Admixtures."

"Type II Modified" portland cement shall conform to the specifications for Type II portland cement in ASTM Designation: C 150.

In addition, "Type IP (MS) Modified" cement and "Type II Modified" portland cement shall conform to the following requirements:

A. The cement shall not contain more than 0.60 percent by weight of alkalies, calculated as the percentage of Na_2O plus 0.658 times the percentage of K_2O, when determined by either direct intensity flame photometry or by the atomic absorption method. The instrument and procedure used shall be qualified as to precision and accuracy in accordance with the requirements of ASTM Designation: C 114.
B. The autoclave expansion shall not exceed 0.50 percent.
C. Mortar, containing the cement to be used and Ottawa sand, when tested in accordance with California Test 527, shall not expand in water more than 0.010 percent and shall not contract in air more than 0.048 percent except that when cement is to be used for precast prestressed concrete piling, precast prestressed concrete members or steam cured concrete products, the mortar shall not contract in air more than 0.053 percent.

The second paragraph in Section 90-2.01, "Portland Cement," of the Standard Specifications is amended to read:

Type III and Type V portland cements shall conform to the specifications in ASTM Designation: C 150, and the modifications listed above for Type II Modified portland cement, except that when tested in accordance with California Test 527, mortar containing Type III portland cement shall not contract in air more than 0.075 percent.

The third paragraph in Section 90-2.01, "Portland Cement," of the Standard Specifications is deleted.

The twelfth paragraph in Section 90-2.02, "Aggregates," of the Standard Specifications is deleted.

The first paragraph in Section 90-2.03, "Water," of the Standard Specifications is amended to read:

90-2.03 Water.—In conventionally reinforced concrete work, the water for curing, for washing aggregates, and for mixing shall be free from oil and shall not contain more than 1,000 parts per million of chlorides as Cl, nor more than 1,300 parts per million of sulfates as SO_4. In prestressed concrete work, the water for curing, for washing aggregates, and for mixing shall be free from oil and shall not contain more than 650 parts per million of chlorides as Cl, nor more than 1,300 parts per million of sulfates as SO_4. In no case shall the water contain an amount of impurities that will cause either: 1) a change in the setting time of cement of more than 25 percent when tested in accordance with ASTM Designation: C 191 or ASTM Designation: C 266; or 2) a reduction in the compressive strength of mortar at 14 days of more than 5 percent, when tested in accordance with ASTM Designation: C 109, when compared to the results obtained with distilled water, tested in accordance with ASTM Designation: C 109.

The following section is added to Section 90-2, "Materials," of the Standard Specifications:

90-2.04 Admixture Materials.—Admixture materials shall conform to the requirements of the ASTM Designations shown below:

Chemical Admixtures—ASTM Designation: C 494.
Air-entraining Admixtures—ASTM Designation: C 260.

Calcium Chloride—ASTM Designation: D 98.

Mineral Admixtures—Coal fly ash, raw or calcined natural pozzolan as specified in ASTM Designation: C 618, except that the loss on ignition shall not exceed 4 percent, or, silica fume as specified in ASTM Designation: C 1240, with reduction of mortar expansion of 80 percent, minimum, using the cement from the proposed mix design.

Mineral admixtures shall be used in accordance with the provisions in Section 90-4.08, "Required Use of Mineral Admixtures."

Section 90-4.02, "Materials," of the Standard Specifications is amended to read:

90-4.02 Materials.—Admixture materials shall be as specified in Section 90-2.04, "Admixture Materials."

Section 90-4.05, "Optional Use of Chemical Admixtures," of the Standard Specifications is amended to read:

90-4.05 Optional Use of Chemical Admixtures.—The Contractor will be permitted to use Type A or F, water-reducing; Type B, retarding; or Type D or G, water-reducing and retarding admixtures as described in ASTM Designation: C 494 to conserve cementitious material or to facilitate any concrete construction application subject to the following conditions:

When a water-reducing admixture or a water-reducing and retarding admixture is used, the cementitious material content specified or ordered may be reduced by a maximum of 5 percent by weight except that the resultant cementitious material content shall be not less than 470 pounds per cubic yard.

When a reduction in cementitious material content is made, the dosage of admixture used shall be the dosage used in determining approval of the admixture.

Section 90-4.07, "Optional Use of Air-entraining Admixtures," of the Standard Specifications is amended to read:

90-4.07 Optional Use of Air-entraining Admixtures.—When air-entrainment has not been specified or ordered by the Engineer, the Contractor will be permitted to use an air-entraining admixture to facilitate the use of any construction procedure or equipment provided that the average air content, as determined by California Test 504, of 3 successive tests does not exceed 4 percent and no single test value exceeds 5.5 percent. If the Contractor elects to use an air-entraining admixture in concrete for pavement, the Contractor shall so indicate at the time the Contractor designates the source of aggregate as provided in Section 40-1.015, "Cement Content."

The minimum amount of mineral admixture to be combined with cement shall not be less than 25 percent by weight of the total amount of cementitious material to be used in the mix.

Section 90-4.08, "Required Use of Mineral Admixtures," of the Standard Specifications is amended to read:

90-4.08 Required Use of Mineral Admixtures.—Unless otherwise specified, mineral admixture shall be combined with cement to make cementitious material for use in portland cement concrete.

The calcium oxide content of mineral admixtures shall not exceed 10 percent and the alkali content as Na_2O shall not exceed 4 percent as determined by California Test 404.

The amounts of cement and mineral admixture used in cementitious material for portland cement concrete shall be sufficient to satisfy the minimum cementitious material content requirements specified in Section 90-1.01, "Description," or Section 90-4.05, "Optional Use of Chemical Admixtures," and shall conform to the following:

The minimum amount of cement shall not be less than 75 percent by weight of the specified minimum cementitious material content.

The minimum amount of mineral admixture to be combined with cement shall be determined using one of the following criteria:

A. When the calcium oxide content of a mineral admixture, measured in conformance with the requirements of ASTM Designation: C 618 and Section 90-2.04, "Admixture Materials," is equal to or less than

2 percent by weight, the amount of mineral admixture shall not be less than 15 percent by weight of the total amount of cementitious material to be used in the mix.

B. When the calcium oxide content of a mineral admixture, measured in conformance with the requirements of ASTM Designation: C 618 and Section 90-2.04, "Admixture Materials," is greater than 2 percent , the amount of mineral admixture shall not be less than 25 percent by weight of the total amount of cementitious material to be used in the mix.

C. When a mineral admixture is used, which conforms to the requirements for silica fume in Section 90-2.04, "Admixture Materials," is used, the amount of mineral admixture shall not be less than 10 percent by weight of the total amount of cementitious material to be used in the mix.

If more than the required amount of cementitious material is used, the balance of the additional cementitious material in the mix may be either cement, mineral admixture or a combination of both; however, the maximum amount of mineral admixture shall not exceed 35 percent by weight of the total amount of cementitious material to be used in the mix. Where Section 90-1.01, "Description," specifies a maximum cementitious content in pounds per cubic yard, the total weight of cement and mineral admixture per cubic yard shall not exceed the specified maximum cementitious material content.

Section 90-4.09, "Optional Use of Mineral Admixture," of the Standard Specifications is deleted.

Section 90-4.11, "Storage, Proportioning, and Dispensing of Mineral Admixtures," of the Standard Specifications is amended to read:

90-4.11 Storage, Proportioning, and Dispensing of Mineral Admixtures.—Mineral admixtures shall be protected from exposure to moisture until used. Sacked material shall be piled to permit access for tally, inspection and identification for each shipment.

Adequate facilities shall be provided to assure that mineral admixtures meeting the specified requirements are kept separate from other mineral admixtures in order to prevent any but the specified mineral admixtures from entering the work. Safe and suitable facilities for sampling mineral admixtures shall be provided at the weigh hopper or in the feed line immediately in advance of the hopper.

Mineral admixtures shall be incorporated into concrete using equipment conforming to the requirements for cement weigh hoppers, and charging and discharging mechanisms in ASTM Designation: C 94, in Section 90-5.03, "Proportioning," and in this Section 90-4.11.

When interlocks are required for cement and mineral admixture charging mechanisms by Section 90-5.03A, "Proportioning for Pavement," and cement and mineral admixtures are weighed cumulatively, their charging mechanisms shall be interlocked to prevent the introduction of mineral admixture until the weight of cement in the cement weigh hopper is within the tolerances specified in Section 90-5.02, "Proportioning Devices."

Mineral admixture used in concrete for exposed surfaces of like elements of a structure shall be from the same source and of the same percentage.

Section 90-5.02, "Proportioning Devices," of the Standard Specifications is amended to read:

90-5.02 Proportioning Devices.—All weighing, measuring or metering devices used for proportioning materials shall conform to the requirements in Section 9-1.01, "Measurement of Quantities," and this Section 90-5.02. In addition, any automatic weighing systems used shall comply with the requirements for automatic proportioning devices in Section 90-5.03A, "Proportioning for Pavement." These automatic devices shall be automatic to the extent that the only manual operation required for proportioning the aggregates, cement, and mineral admixture for one batch of concrete is a single operation of a switch or starter.

Proportioning devices shall be tested at the expense of the Contractor as frequently as the Engineer may deem necessary to insure their accuracy.

Weighing equipment shall be insulated against vibration or movement of other operating equipment in the plant. When the plant is in operation, the weight of each batch of material shall not vary from the weight designated by the Engineer by more than the tolerances specified herein.

Equipment for cumulative weighing of aggregate shall have a zero tolerance of ±0.5 percent of the designated total batch weight of the aggregate. For systems with individual weigh hoppers for the various sizes of aggregate, the zero tolerance shall be ±0.5 percent of the individual batch weight designated for each size of aggregate. Equipment for cumulative weighing of cement and mineral admixtures shall have a zero tolerance of ±0.5 percent of the designated total batch weight of the cement and mineral admixture. Equipment for weighing cement or mineral

admixture separately shall have a zero tolerance of ±0.5 percent of their designated individual batch weights. Equipment for measuring water shall have a zero tolerance of ±0.5 percent of its designated weight or volume.

The weight indicated for any batch of material shall not vary from the preselected scale setting by more than the following:

A. Aggregate weighed cumulatively shall be within 1.0 percent of the designated total batch weight of the aggregate. Aggregates weighed individually shall be within 1.5 percent of their respective designated batch weights.
B. Cement shall be within 1.0 percent of its designated batch weight. When weighed individually, mineral admixture shall be within 1.0 percent of its designated batch weight. When mineral admixture and cement are permitted to be weighed cumulatively, cement shall be weighed first to within 1.0 percent of its designated batch weight, and the total for cement and mineral admixture shall be within 1.0 percent of the sum of their designated batch weights.
C. Water shall be within 1.5 percent of its designated weight or volume.

Each scale graduation shall be approximately 0.001 of the total capacity of the scale. The capacity of scales for weighing cement, mineral admixture, or cement plus mineral admixture and aggregates shall not exceed that of commercially available scales having single graduations indicating a weight not exceeding the maximum permissible weight variation above, except that no scale shall be required having a capacity of less than 1,000 pounds, with one-pound graduations.

Section 90-5.03, "Proportioning," of the Standard Specifications is amended to read:

90-5.03 Proportioning.—Proportioning shall consist of dividing the aggregates into the specified sizes, each stored in a separate bin, and combining them with cement, mineral admixture and water as provided in these specifications. Aggregates shall be proportioned by weight.

At the time of batching, all aggregates shall have been dried or drained sufficiently to result in a stable moisture content such that no visible separation of water from aggregate will take place during transportation from the proportioning plant to the point of mixing. In no event shall the free moisture content of the fine aggregate at the time of batching exceed 8 percent of its saturated, surface-dry weight.

Should separate supplies of aggregate material of the same size group, but of different moisture content or specific gravity or surface characteristics affecting workability, be available at the proportioning plant, withdrawals shall be made from one supply exclusively and the materials therein completely exhausted before starting upon another.

Bulk "Type IP (MS) Modified" cement, that conforms to the requirements in Section 90-2.01, "Portland Cement," shall be weighed in an individual hopper and shall be kept separate from the aggregates until the ingredients are released for discharge. Except as otherwise noted below, the cement hoppers may be attached to a separate scale for individual weighing. If the cement is weighed cumulatively, the cement shall be weighed before the other ingredients.

Bulk cement to be blended with mineral admixture for use in portland cement concrete for pavement and structures shall be proportioned by one of the following methods:

1. Bulk cement and mineral admixture shall be weighed in individual weigh-hoppers and shall be kept separate from each other and from the aggregates until the ingredients are released for discharge into the mixer. The weigh systems for the proportioning of the aggregate, the cement, and the mineral admixture shall be individual and distinct from all other weigh systems. Each weigh system shall be equipped with a hopper, a lever system, and a weight indicator to constitute an individual and independent material weighing device. The aggregate, the cement, and the mineral admixture shall be discharged into the mixer simultaneously.
2. Bulk cement and mineral admixture may be weighed in the same weigh hopper if the mix uniformity conforms to the requirements of Annex "A1, Concrete Uniformity Requirements," of ASTM Designation: C 94 as tested by the Contractor. The capability of the mixing methods and devices shall be established before starting production of portland cement concrete for contract work. Mix uniformity sampling and testing shall be done in the presence of the Engineer. The Engineer shall approve the mixing methods and devices as a supplement to California Test 109. The time between tests for mix uniformity testing shall be the same as that required by California Test 109 for portland cement concrete batch plant scale calibration.

The scale and weigh hopper for bulk weighing cement, mineral admixture, and cement plus mineral admixture shall be separate and distinct from the aggregate weighing equipment.

When the source of any aggregate is changed for concrete structures, the Contractor shall adjust the mix proportions and submit in writing to the Engineer a copy of the mix design before using such aggregates. When the source of any aggregate is changed for other concrete, the Engineer shall be allowed sufficient time to adjust the mix and such aggregates shall not be used until necessary adjustments are made.

For all batches with a volume of one cubic yard or more, the batching equipment shall conform to one of the following combinations:

A. Separate boxes and separate dial or beam scale and indicator for weighing each size of aggregate.
B. Single box and dial or multiple beam type scale indicator for all aggregates.
C. Single box or separate boxes and automatic weighing mechanism for all aggregates.

In order to check the accuracy of batch weights, the gross weight and tare weight of batch trucks, truck mixers, truck agitators, and non-agitating hauling equipment shall be determined when ordered by the Engineer. The equipment shall be weighed at the Contractor's expense on scales designated by the Engineer.

Section 90-5.03A, "Proportioning for Pavement," of the Standard Specifications is amended to read:

90-5.03A Proportioning for Pavement.—Aggregates and bulk cement, mineral admixture, and cement plus mineral admixture for use in pavement shall be proportioned by weight by means of automatic proportioning devices of approved type conforming to the requirements specified in this Section 90-5.03A.

The Contractor shall install and maintain in operating condition an electrically actuated moisture meter that will indicate, on a readily visible scale, changes in the moisture content of the fine aggregate as it is batched within a sensitivity of 0.5 percent by weight of the fine aggregate.

The batching of cement, mineral admixture, or cement plus mineral admixture and aggregate shall be interlocked so that a new batch cannot be started until all weigh hoppers are empty, the proportioning devices are within zero tolerance, and the discharge gates are closed. The interlock shall permit no part of the batch to be discharged until all aggregate hoppers and the cement and mineral admixture hoppers or the cement plus mineral admixture hopper are charged with weights which are within the tolerances specified in Section 90-5.02, "Proportioning Devices."

The discharge gate on the cement and mineral admixture hoppers or the cement plus mineral admixture hopper shall be designed to permit regulating the flow of cement, mineral admixture, or cement plus mineral admixture into the aggregate as directed by the Engineer.

When separate weigh boxes are used for each size of aggregate, the discharge gates shall permit regulating the flow of each size of aggregate as directed by the Engineer.

Material discharged from the several bins shall be controlled by gates or by mechanical conveyors. The means of withdrawal from the several bins, and of discharge from the weigh box, shall be interlocked so that not more than one bin can discharge at a time, and that the weigh box cannot be tripped until the required quantity from each of the several bins has been deposited therein. Should a separate weigh box be used for each size of aggregate, all may be operated and discharged simultaneously.

When the discharge from the several bins is controlled by gates, each gate shall be actuated automatically so that the required weight is discharged into the weigh box, after which the gate shall automatically close and lock.

The automatic weighing system shall be designed so that all proportions required may be set on the weighing controller at the same time.

The third paragraph in Section 90-6.01, "General," of the Standard Specifications is amended to read:

All concrete shall be homogeneous and thoroughly mixed, and there shall be no lumps or evidence of undispersed cement, mineral admixture, or cement plus mineral admixture.

The third and fourth paragraphs in Section 90-6.02, "Machine Mixing," of the Standard Specifications are amended to read:

The batch shall be so charged into the mixer that some water will enter in advance of cementitious materials and aggregates. All water shall be in the drum by the end of the first one-fourth of the specified mixing time.

Cementitious materials shall be batched and charged into the mixer by means that will not result either in loss of cementitious materials due to the effect of wind, or in accumulation of cementitious materials on surfaces of conveyors or hoppers, or in other conditions which reduce or vary the required quantity of cementitious material in the concrete mixture.

The sixth paragraph in Section 90-6.02, "Machine Mixing," of the Standard Specifications is amended to read:

The total elapsed time between the intermingling of damp aggregates and all cementitious materials and the start of mixing shall not exceed 30 minutes.

The seventh and eighth paragraphs in Section 90-6.03, "Transporting Mixed Concrete," of the Standard Specifications are amended to read:

When a truck mixer or agitator is used for transporting concrete to the delivery point, discharge shall be completed within 1.5 hours, or before 250 revolutions of the drum or blades, whichever comes first, after the introduction of the cement to the aggregates. Under conditions contributing to quick stiffening of the concrete, or when the temperature of the concrete is 85° F., or above, a time less than 1.5 hours may be required.

When non-agitating hauling equipment is used for transporting concrete to the delivery point, discharge shall be completed within one hour after the addition of the cement to the aggregates. Under conditions contributing to quick stiffening of the concrete, or when the temperature of the concrete is 85° F., or above, the time between the introduction of cement to the aggregates and discharge shall not exceed 45 minutes.

The ninth and tenth paragraphs in Section 90-6.03, "Transporting Mixed Concrete," of the Standard Specifications are amended to read:

Each load of concrete delivered at the jobsite shall be accompanied by a ticket showing the mix identification number, non-repeating load number, date and time at which the materials were batched, the total amount of water (gallons) added to the load and for transit-mixed concrete, the reading of the revolution counter at the time the truck mixer is charged with cement. This ticket shall also show the actual scale weights (pounds) for the ingredients batched or the calculated portland cement concrete volume (cubic yards) calculated from actual scale weights. Theoretical or target batch weights shall not be used as a substitute for actual scale weights. When showing a calculated portland cement concrete volume on the delivery ticket, the Contractor shall maintain and have available a record of the following information for each batched load:

1. Mix identification number, specific to the contract.
2. Load number shall match the load number on the delivery ticket.
3. Date and time the load was batched.
4. Actual batch weight (pounds) for each ingredient.
5. Any water (gallons) added at the plant, in addition to the water proportioned for the batch.

When requested, the Contractor shall submit the recorded information for calculated portland cement concrete volumes to the Engineer. The information shall be provided in printed form, or if acceptable to the Engineer, data may be submitted in electronic media. Electronic media shall be presented in a tab delimited format on a 3.5-inch diskette with a capacity of at least 1.4 megabytes. Captured data, for the ingredients represented by each batch shall be LFCR (one line, separate record) with allowances for sufficient fields to satisfy the amount of data required by these specifications.

Section 90-6.05, "Hand-Mixing," of the Standard Specifications is amended to read:

90-6.05 Hand-Mixing.—Hand-mixed concrete shall be made in batches not more than one-third cubic yard and shall be mixed on a watertight, level platform. The proper amount of coarse aggregate shall be measured in measuring boxes and spread on the platform and the fine aggregate shall be spread on this layer, the 2 layers being not more than one foot in total depth. On this mixture shall be spread the dry cement and mineral admixture and the whole mass turned no fewer than 2 times dry; then sufficient clean water shall be added, evenly distributed, and the whole mass again turned no fewer than 3 times, not including placing in the carriers or forms.

The second paragraph in Section 90-6.06, "Amount of Water and Penetration," of the Standard Specifications is amended to read:

The amount of free water used in concrete shall not exceed 312 pounds per cubic yard, plus 20 pounds for each required 100 pounds of cementitious material in excess of 564 pounds per cubic yard.

The fourth paragraph in Section 90-6.06, "Amount of Water and Penetration," of the Standard Specifications is amended to read:

Where there are adverse or difficult conditions which affect the placing of concrete, the above specified penetration and free water content limitations may be exceeded providing the Contractor is granted permission by the Engineer in writing to increase the cementitious material content per cubic yard of concrete. The increase in water and cementitious material shall be at a ratio not to exceed 30 pounds of water per added 100 pounds of cementitious material per cubic yard. The cost of additional cementitious material and water added under these conditions shall be at the Contractor's expense and no additional compensation will be allowed therefor.

Section 90-9.01, "General," of the Standard Specifications is amended to read:

90-9.01 General.—Concrete compressive strength requirements consist of a minimum strength which must be attained before various loads or stresses are applied to the concrete and, for concrete designated by strength, a minimum strength at the age of 28 days or at the age otherwise allowed in Section 90-1.01, "Description." The various strengths required are specified elsewhere or are shown on the plans.

The compressive strength of concrete will be determined from test cylinders which have been fabricated from concrete sampled in accordance with California Test 539. Test cylinders will be molded and initial field cured in accordance with California Test 540. Test cylinders will be cured and tested after receipt at the testing laboratory in accordance with California Test 521. A strength test shall consist of the average strength of 2 cylinders fabricated from material taken from a single load of concrete, except that, if any cylinder should show evidence of improper sampling, molding, or testing, that cylinder shall be discarded and the strength test shall consist of the strength of the remaining cylinder.

When concrete compressive strength is specified as a prerequisite to applying loads or stresses to a concrete structure or member, test cylinders for other than steam cured concrete will be cured in accordance with Method 1 of California Test 540. The compressive strength of concrete determined for these purposes will be evaluated on the basis of individual tests.

When concrete is designated by 28-day compressive strength rather than by cementitious material content, the concrete strength to be used as a basis for acceptance of other than steam cured concrete will be determined from cylinders cured in conformance with Method 1 of California Test 540. If the result of a single compressive strength test at the maximum age specified or allowed is below the specified strength but is 95 percent or more of the specified strength, the Contractor shall, at the Contractor's expense, make corrective changes, subject to approval of the Engineer, in the mix proportions or in the concrete fabrication procedures, before placing additional concrete, and shall pay to the State $10.00 for each in-place cubic yard of concrete represented by the deficient test. If the result of a single compressive strength test at the maximum age specified or allowed is below 95 percent of the specified strength, but is 85 percent or more of the specified strength, the Contractor shall make the corrective changes specified above, and shall pay to the State $15.00 for each in place cubic yard of concrete represented by the deficient test. In addition, such corrective changes shall be made when the compressive strength of concrete tested at 7 days indicates, in the judgment of the Engineer, that the concrete will not attain the required compressive strength at the maximum age specified or allowed. All concrete represented by a single test which indicates a compressive strength of less than 85 percent of the specified 28-day compressive strength will be rejected in accordance with the provisions in Section 6-1.04, "Defective Materials."

If the test result indicates that the compressive strength at the maximum curing age specified or allowed is below the specified strength, but 85 percent or more of the specified strength, payments to the State as required above shall be made, unless the Contractor, at the Contractor's expense, obtains and submits evidence acceptable to the Engineer that the strength of the concrete placed in the work meets or exceeds the specified 28-day compressive strength. If the test result indicates a compressive strength at the maximum curing age specified or allowed below 85 percent, the concrete represented by that test will be rejected, unless the Contractor, at the Contractor's expense, obtains and submits evidence acceptable to the Engineer that the strength and quality of the concrete placed in the

work are acceptable. If the evidence consists of tests made on cores taken from the work, the cores shall be obtained and tested in accordance with the specifications of ASTM Designation: C 42.

No single compressive strength test shall represent more than 300 cubic yards.

When a precast concrete member is steam cured, the compressive strength of the concrete will be determined from test cylinders which have been handled and stored in accordance with Method 3 of California Test 540. The compressive strength of steam cured concrete will be evaluated on the basis of individual tests representing specific portions of production. When the concrete is designated by 28-day compressive strength rather than by cementitious material content, the concrete shall be considered to be acceptable whenever its compressive strength reaches the specified 28-day compressive strength provided that strength is reached in not more than the maximum number of days specified or allowed after the member is cast.

When concrete is specified by compressive strength, prequalification of materials, mix proportions, mixing equipment, and procedures proposed for use, will be required prior to placement of the concrete. Prequalification shall be accomplished by the submission of acceptable certified test data or trial batch reports by the Contractor. Prequalification data shall be based on the use of materials, mix proportions, mixing equipment, procedures, and size of batch proposed for use in the work.

Certified test data, in order to be acceptable, must indicate that not less than 90 percent of at least 20 consecutive tests exceed the specified strength at the maximum number of cure days specified or allowed, and none of those tests are less than 95 percent of specified strength. Strength tests included in the data shall be the most recent tests made on concrete of the proposed mix design and all shall have been made within one year of the proposed use of the concrete.

Trial batch test reports, in order to be acceptable, must indicate that the average compressive strength of 5 consecutive concrete cylinders, taken from a single batch, at not more than 28 days (or the maximum age allowed) after molding shall be at least 600 pounds per square inch greater than the specified 28-day compressive strength, and no individual cylinder shall have a strength less than the specified strength at the maximum age specified or allowed. Data contained in the report shall be from trial batches which were produced within one year of the proposed use of specified strength concrete in the project. Whenever air-entrainment is required, the air content of trial batches shall be equal to or greater than the air content specified for the concrete without reduction due to tolerances.

All tests shall be performed in accordance with either the appropriate California Test methods or the comparable ASTM test methods. All equipment employed in testing shall be in good condition and shall be properly calibrated. If the tests are performed during the life of the contract, the Engineer shall be notified sufficiently in advance of performing the tests in order to witness the test procedures.

The certified test data and trial batch test reports shall include the following information:

A. Date of mixing.
B. Mixing equipment and procedures used.
C. The size of batch in cubic yards and the weight, type and source of all ingredients used.
D. Penetration of the concrete.
E. The air content of the concrete if an air-entraining admixture is used.
F. The age at time of testing and strength of all concrete cylinders tested.

All certified test data and trial batch test reports shall be signed by an official of the firm which performed the tests.

When approved by the Engineer, concrete from trial batches may be used in the work at locations where concrete of a lower quality is required and the concrete will be paid for as the type or class of concrete required at that location.

After materials, mix proportions, mixing equipment, and procedures for concrete have been prequalified for use, additional prequalification by testing of trial batches will be required prior to making any changes which, in the judgment of the Engineer, could result in a lowering of the strength of the concrete below that specified.

The Contractor's attention is directed to the time required to test trial batches and the Contractor shall be responsible for production of trial batches at a sufficiently early date so that the progress of the work is not delayed.

When precast concrete members are manufactured at the plant of an established manufacturer of precast concrete members, the mix proportions of the concrete shall be determined by the Contractor, and a trial batch and prequalification of the materials, mix proportions, mixing equipment, and procedures will not be required.

Section 90-10.02A, "Portland Cement," of the Standard Specifications is renamed "Cementitious Material" and amended to read:

90-10.02A Cementitious Material.—Cementitious material shall conform to the provisions in Section 90-1.01, "Description." Compressive strength requirements consist of a minimum strength which must be attained before various loads or stresses are applied to the concrete and, for concrete designated by strength, a minimum strength at the age of 28 days or at the age otherwise allowed in Section 90-1.01, "Description." The various strengths required are specified elsewhere or are shown on the plans.

The fifth paragraph in Section 90-10.02B, "Aggregate," of the Standard Specifications is deleted.
Section 90-10.03, "Production," of the Standard Specifications is amended to read:

90-10.03 Production.—Cementitious material, water, aggregate, and admixtures shall be stored, proportioned, mixed, transported, and discharged in conformance with recognized standards of good practice, which will result in concrete that is thoroughly and uniformly mixed, that is suitable for the use intended, and which conforms to requirements specified herein. "Recognized standards of good practice" are outlined in various industry publications such as are issued by American Concrete Institute, AASHTO, or California Department of Transportation.

The cementitious material content of minor concrete shall conform to the provisions in Section 90-1.01, "Description."

The amount of water used shall result in a consistency of concrete conforming to the provisions in Section 90-6.06, "Amount of Water and Penetration." Additional mixing water shall not be incorporated into the concrete during hauling or after arrival at the delivery point, unless authorized by the Engineer.

Discharge of ready-mixed concrete from the transporting vehicle shall be made while the concrete is still plastic and before any stiffening occurs. An elapsed time of 1.5 hours (one hour in non-agitating hauling equipment), or more than 250 revolutions of the drum or blades, after the introduction of the cementitious material to the aggregates, or a temperature of concrete of more than 90° F. will be considered as conditions contributing to the quick stiffening of concrete. The Contractor shall take whatever action is necessary to eliminate quick stiffening, except that the addition of water will not be permitted.

The required mixing time in stationary mixers shall be not less than 50 seconds nor more than 5 minutes.

The minimum required revolutions at mixing speed for transit-mixed concrete shall be not less than that recommended by the mixer manufacturer, and shall be increased, if necessary, to produce thoroughly and uniformly mixed concrete.

Each load of ready-mixed concrete shall be accompanied by a ticket which shall be delivered to the Engineer at the discharge location of the concrete, unless otherwise directed by the Engineer. The ticket shall be clearly marked with the date and time of day when the load left the batching plant and, if hauled in truck mixers or agitators, the time the mixing cycle started.

A Certificate of Compliance in accordance with the provisions in Section 6-1.07, "Certificates of Compliance," shall be furnished to the Engineer, prior to placing minor concrete from a source not previously used on the contract, stating that minor concrete to be furnished meets all contract requirements, including minimum cementitious material content specified.

The third and fourth paragraphs in Section 90-11.02, "Payment," of the Standard Specifications are amended to read:

Should the Engineer order the Contractor to incorporate any admixtures in the concrete when their use is not required by these specifications or the special provisions, furnishing the admixtures and adding them to the concrete will be paid for as extra work as provided in Section 4-1.03D.

Should the Contractor use admixtures as permitted under Sections 90-4.05, "Optional Use of Chemical Admixtures;" or 90-4.07, "Optional Use of Air-entraining Admixtures;" or should the Contractor request and obtain permission to use other admixtures for the Contractor's benefit, the Contractor shall furnish those admixtures and incorporate them in the concrete at the Contractor's expense and no additional compensation will be allowed therefor.

SECTION 8-3. WELDING

8-3.01 WELDING ELECTRODES

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

8-3.02 WELDING QUALITY CONTROL

Welding quality control shall apply to the items of work described herein and shall conform to the requirements in the AWS welding codes, the Standard Specifications and these special provisions.

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	1996
D1.4	1992
D1.5	1995
D1.5 (metric only)	1996

All requirements of the AWS welding codes shall apply unless specified otherwise 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 ANSI/AASHTO/AWS.

Except for steel piling, welding performed anywhere other than at a permanent fabrication facility that is certified under the AISC Quality Certification Program, Category III, Major Steel Bridges, shall conform to the provisions for welding quality control as specified herein.

The welding of all fracture critical members (FCMs) shall conform to the provisions specified in the Fracture Control Plan (FCP) and herein.

Unless otherwise specified, when any type of welding is performed on items of work including 1) bar reinforcement, 2) steel structures, 3) column casings and 4) miscellaneous metal, 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 all welding, including materials and workmanship, performed by the Contractor and all subcontractors.

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.

No welding inspection personnel or nondestructive testing (NDT) firms to be used in the work shall 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 shall be the sole individual responsible to the Contractor for submitting and receiving all correspondence and required submittals and reports regarding welding to and from the Engineer.

Prior to submitting the Quality Control Plan (QCP) required herein, a pre-welding meeting shall be held between the Engineer, Contractor and any welding subcontractors to be used in the work to discuss the requirements for the QCP.

Prior to performing any welding, the Contractor shall submit to the Engineer, in accordance with the provisions of Section 5-1.02, "Plans and Working Drawings," of the Standard Specifications, 3 copies of a separate QCP for each item of work for which welding is to be performed. As a minimum, each QCP shall include the following:

1. The name of the welding firm and the NDT firm to be used;
2. A manual prepared by the NDT firm that shall include equipment, testing procedures, code of safe practices, the Written Practice of the NDT firm, and the names, qualifications and documentation of certifications for all personnel to be used;
3. The name of the QCM and the names, qualifications and documentation of certifications for all Quality Control (QC) Inspectors and Assistant Quality Control Inspectors to be used;
4. An organizational chart showing all QC personnel and their assigned QC responsibilities;
5. The methods and frequencies for performing all required quality control procedures, including QC inspection forms to be used, as required by the specifications including:

   (a) all visual inspections;
   (b) all NDT including radiographic geometry, penetrameter and shim selection, film quality, film processing, radiograph identification and marking system, and film interpretation and reports; and
   (c) calibration procedures and calibration frequency for all NDT equipment;

6. A system for the identification and tracking of all welds, NDT and any required repairs, and a procedure for the reinspection of any repaired welds. The system shall have provisions for 1) permanently identifying each weld and the person who performed the weld and 2) placing all identification and tracking information on each radiograph;
7. Standard procedures for performing noncritical repair welds. Noncritical repair welds are defined as welds to deposit additional weld beads or layers to compensate for insufficient weld size and to fill limited excavations that were performed to remove unacceptable edge or surface discontinuities, rollover or undercut. The depth of these excavations shall not exceed 65 percent of the specified weld size;
8. The welding procedure specification (WPS), including documentation of all supporting Procedure Qualification Record (PQR) tests performed, and the name of the testing laboratory who performed the tests, to verify the acceptability of the WPS. The submitted WPS shall be within the allowable period of effectiveness;
9. Documentation of all certifications for welders for each weld process and position that will be used. Certifications shall list the electrodes used, test position, base metal and thickness, tests performed, and the witnessing authority. All certifications shall be within the allowable period of effectiveness; and
10. One copy each of all AWS welding codes and the FCP which are applicable to the welding to be performed. These codes and the FCP shall become the permanent property of the Department.

The Engineer shall have 10 working days to review the QCP submittal after a complete plan has been received. No welding shall be performed until the QCP is approved in writing by the Engineer. Should the Engineer fail to complete the review within this time allowance and if, in the opinion of the Engineer, the Contractor's controlling operation is delayed or interfered with by reason of the delay in reviewing the QCP, the delay will be considered a right of way delay as specified in Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

An amended QCP or addendum shall be submitted to, and approved in writing by the Engineer, for any proposed revisions to the approved QCP. An amended QCP or addendum will be required for any revisions to the QCP, including but not limited to a revised WPS, additional welders, changes in NDT firms or procedures, QC or NDT personnel, or updated systems for tracking and identifying welds. The Engineer shall have 3 working days to complete the review of the amended QCP or addendum. Work that is affected by any of the proposed revisions shall not be performed until the amended QCP or addendum has been approved. Should the Engineer fail to complete the review within this time allowance and if, in the opinion of the Engineer, the Contractor's controlling operation is delayed or interfered with by reason of the delay in reviewing the amended QCP or addendum, the delay will be considered a right of way delay as specified in Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

After final approval of the QCP, amended QCP or addendum, the Contractor shall submit to the Engineer 7 copies each of these approved documents.

A daily production log for welding shall be kept by the QCM for each day that welding is performed. The log shall clearly indicate the locations of all welding, and 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 Quality Control Inspector shall also be included in the log.

It is expressly understood that the Engineer's approval of the Contractor's QCP shall not relieve the Contractor of any responsibility under the contract for the successful completion of the work in conformity with the requirements of the plans and specifications. The Engineer's approval shall not constitute a waiver of any of the requirements of the plans and specifications nor relieve the Contractor of any obligation thereunder, and defective work, materials and equipment may be rejected notwithstanding approval of the QCP.

The following items shall be included in a Welding Report that is to be submitted to the Engineer within 7 days following the performance of any welding:

1. Reports of all visual weld inspections and NDT;
2. Radiographs and radiographic reports, and other required NDT reports;
3. Documentation that the Contractor has evaluated all radiographs and other nondestructive tests, corrected all rejectable deficiencies, and all repaired welds have been reexamined by the required NDT and found acceptable; and
4. Daily production log.

All reports regarding NDT, including radiographs, shall be signed by both NDT technician and the person that performed the review, and then submitted directly 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.

The Engineer shall review the Welding Report to determine if the Contractor is in conformance with the QCP. The Engineer shall be allowed 7 days to review the report and respond in writing after a complete Welding Report has been received. Prior to receiving notification from the Engineer of the Contractor's conformance with the QCP, the Contractor may encase in concrete or cover any welds for which a 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. Any material not conforming to these requirements will be subject to rejection. Should the Contractor elect to wait to encase or cover any welds pending notification by the Engineer, and should the Engineer fail to complete the review and provide notification within this time allowance, and if, in the opinion of the Engineer, the Contractor's controlling operation is delayed or interfered with by reason of the delay in notification, the delay will be considered a right of way delay as specified in Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

Sections 6.1.1 through 6.1.3.3 of AWS D 1.1, Sections 7.1.1 and 7.1.2 of AWS D 1.4, and Sections 6.1.1.1 through 6.1.3.3 of AWS D 1.5 are replaced with the following:

Quality Control (QC) shall be the responsibility of the Contractor. As a minimum, the Contractor shall perform inspection and testing prior to welding, during welding and after welding as specified in this section and additionally as necessary to ensure that materials and workmanship conform to the requirements of the contract documents.

The Quality Control (QC) Inspector shall be the duly designated person who performs inspection, testing, and quality 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.

All QC Inspectors shall be responsible for quality control acceptance or rejection of materials and workmanship, and shall be currently certified as AWS Certified Welding Inspectors (CWI) in accordance with the provisions of AWS QC1, "Standard and Guide for Qualification 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 accordance with the provisions of AWS QC1, "Standard and Guide for Qualification of Welding Inspectors," or has equivalent qualifications. The QC Inspector shall monitor the Assistant QC Inspector’s work, and shall be responsible for signing all reports.

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

Section 6.14.7, "Personnel Qualification," of AWS D 1.1, Section 7.7.6, "Personnel Qualification," of AWS D 1.4 and Section 6.1.3.4, "Personnel Qualification," of AWS D 1.5 are amended to read:

Personnel performing NDT shall be qualified in accordance with the current edition of the American Society for Nondestructive Testing (ASNT) Recommended Practice No. SNT-TC-1A and the Written Practice of the NDT firm. Only individuals who are 1) qualified for NDT Level II, or 2) Level III technicians who have been directly certified by the ASNT and are authorized to perform the work of Level II technicians, shall perform NDT, review the results, and prepare the written reports.

Section 6.5.4, "Scope of Examination," of AWS D 1.1 and Section 7.5.4 of AWS D 1.4 are amended to read:

The QC Inspector shall inspect and approve the joint preparation, assembly practice, welding techniques, and performance of each welder, welding operator, and tack welder to make certain that the applicable requirements of this code and the approved WPS are met.

Section 6.5.4 of AWS D 1.5 is amended to read:

The QC Inspector shall inspect and approve the joint preparation, assembly practice, welding techniques, and performance of each welder, welding operator, and tack welder to make certain that the applicable requirements of this code and the approved WPS are met. The QC Inspector shall examine the work to make certain that it meets the requirements of section 3 and 9.21. The size and contour of welds shall be measured using suitable gages. Visual inspection for cracks in welds and base metal, and for other discontinuities should 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.

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

A sufficient number of QC Inspectors shall be provided to ensure continuous inspection when any welding is being performed. Continuous inspection, as a minimum, shall include (1) having QC Inspectors continually present on all shifts when any welding is being performed, or (2) having a QC Inspector within such close proximity of all welding operations that inspections by the QC Inspector of each operation, at each welding location, shall not lapse for a period exceeding 30 minutes.

Inspection and approval of the joint preparation, assembly practice, welding techniques, and performance of each welder, welding operator, and tack welder shall be documented by the QC Inspector on a daily basis for each day that welding is performed.

The QC Inspector shall provide reports to the QCM on a daily basis for each day that welding is performed.

Except for noncritical weld repairs, base metal repairs, or any other type of repairs not submitted in the QCP, the Engineer shall be notified immediately in writing when any welding problems or deficiencies are discovered and also of the proposed repair procedures to correct them. The Engineer shall have 5 working days to review these procedures. No remedial work shall begin until the repair procedures are approved in writing by the Engineer. Should the Engineer fail to complete the review within this time allowance and if, in the opinion of the Engineer, the Contractor's controlling operation is delayed or interfered with by reason of the delay in reviewing the proposed repair procedures, the delay will be considered a right of way delay as specified in Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

When joint details that are not prequalified by the applicable AWS codes are proposed for use in the work, all welders using these details shall perform a qualification test plate using the approved WPS variables and the joint detail to be used in production. The test plate shall be the maximum thickness to be used in production. The test plate shall be mechanically or radiographically tested as directed by the Engineer. Mechanical and radiographic testing and acceptance criteria shall be as specified in the applicable AWS codes.

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. 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 work remains satisfactory.

All qualification tests for welders, welding operators, and WPSs used in welding operations will be witnessed by the Engineer or an independent third party acceptable to the Engineer.

Section 6.6.5, "Nonspecified Nondestructive Testing Other Than Visual," of AWS D 1.1, Section 6.6.5 of AWS D 1.4 and Section 6.6.5 of AWS D 1.5 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 welding codes, in the Standard Specifications or in these special provisions. Additional NDT required by the Engineer, will be paid for as extra work in accordance with Section 4-1.03D, "Extra Work," of the Standard Specifications. Should any welding deficiencies be discovered by this additional NDT, the cost of the testing will not be paid for as extra work, and shall be at the Contractor’s expense.

All required repair work to correct welding deficiencies, whether discovered by the required visual inspection or NDT, or by additional NDT directed by the Engineer, and any associated delays or expenses caused to the Contractor by performing these repairs, shall be at the Contractor’s expense.

At the completion of all welding, the QCM shall sign and furnish to the Engineer, a certificate of compliance in accordance with 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 accordance with the details shown on the plans and the provisions of the Standard Specifications and these special provisions.

Full compensation for conforming to all of the requirements of this section, Welding Quality Control, shall be considered as included in the contract prices paid for the various contract items of work involved and no additional compensation will be allowed therefor.

SECTION 9. DESCRIPTION OF BRIDGE WORK

The bridge work to be done consist, in general of seismic retrofitting portions of the following bridge, as shown on the plans:

San Francisco-Oakland Bay Bridge
(Bridge No. 34-0003)

SECTION 10. CONSTRUCTION DETAILS

SECTION 10-1. GENERAL

10-1.01 ORDER OF WORK

Order of work shall conform to the provisions in Section 5-1.05, "Order of Work," of the Standard Specifications and these special provisions.

The Contractor shall comply with California Endangered Species Act, the Federal Endangered Species Act and the Federal Migratory Bird Treaty Act, which govern protection of the peregrine falcon including nesting sites. The preferred nesting sites for these birds is pier W-4 on the west side of the San Francisco-Oakland Bay Bridge. Work within a 300-foot radius of pier W-4 should be scheduled to begin prior to the onset of the nesting period in early February or after the chicks are removed in early June. There must be at least one pier excluded from the work schedule during the nesting period in order to ensure that the birds have an alternate nest site available, particularly if work is underway at W-4 prior to the start of the nesting period. Piers 2, 3, and 5 are acceptable alternative sites.

Once the birds have established a nest on pier W-4, or on any of the other piers, no work within a 300 foot radius in all directions from the nest site shall be allowed during the nesting period of the second week of February through the first week of June.

Prior to the start of work, the Contractor shall provide the Resident Engineer with a proposed schedule of work. This schedule of work will then be transmitted, by the Resident Engineer to the Santa Cruz Predatory Bird Research Group who will assist in determining nestiing activities and monitor the nesting sites. The Contractor shall provide necessary assistance to the Santa Cruz Predatory Bird Research Group. Monitoring would begin in January. Prior to the birds fledging, the Santa Cruz Predatory Bird Research Group will remove the chicks from nest and release them elsewhere.

The Engineer shall notify the Contractor as to the presence of gull nests and the Contractor shall not disturb nests. In the event that the Western Gulls are nesting during the period mentioned above and, if in the opinion of the Engineer, the Contractor's operations are delayed or interfered with by reason of this nesting, the State will compensate the Contractor for such delays to the extent provided in Section 8-1.09, "Right of Way Delays," of the Standard Specifications, and not otherwise, except as provided in Section 8-1.10, "Utility and Non-Highway Facilities," of the Standard Specifications.

The Contractor is directed to the Environmentally Sensitive Area (ESA), a harbor seal haulout, on the southwest side of Yerba Buena Island. All activities are excluded from the shoreline extending out in a radius of 100 yards from the harbor seal haulout.

Temporary railing (Type K) shall be in place at locations shown on the plans prior to starting any adjacent construction activities.

Full compensation for conforming to the requirements of this section shall be considered as included in the prices paid for the various contract items of work involved and no additional compensation will be allowed therefor.

The first order of work shall be to place the order for the electrical facilities' equipment (seismic retrofit). The Contractor shall furnish the Engineer with a statement from the vendor that the order for said equipment has been received and accepted by said vendor.

The following electrical systems shall not be modified until the replacement system has been installed and fully tested. Temporary system support is permitted only with the Engineer's prior written approval of the Contractor's written temporary support proposal.

1. The 15kV cable system between the Sterling Substation and the Pier W-4 Substation.
2. The Bridge phone system between the west bay paint yard to the Pier W-7 splice cabinet.
3. The Beale Street 15kV to 480V conversion system.
4. All Navigational lighting system at each location or subsystem.

The work shall be performed in conformance with the stages of construction shown on the plans. Nonconflicting work in subsequent stages may proceed concurrently with work in preceding stages, provided satisfactory progress is maintained in the preceding stages of construction.

All contract work between Pier W1 and the San Francisco Anchorage except the installation of the viscous dampers shall be diligently pursued to completion on or before September 1, 2000, beginning at 12:01 a.m. on the first working day after contract award. In the event that all contract work between Pier W1 and the San Francisco Anchorage is not completed by September 1, 2000, damage will be sustained by the State of California and it is and will be impracticable and

extremely difficult to ascertain and determine the actual damage. It is therefore agreed by the parties that for each and every calendar day's delay in completing all contract work between Pier W1 and the San Francisco Anchorage, the Contractor will pay to the State the sum of $5200 per day as liquidated damages. The Contractor agrees to pay the liquidated damages herein provided for, and further agrees that the Department may deduct the amount thereof from any moneys due or that may become due the Contractor under the contract.

Replacement of the bearings at Pier W1 shall be completed prior to retrofitting continuous truss chord L0-L1.

10-1.02 NON-STORM WATER DISCHARGES.

Non-storm water discharges shall conform to the requirements in Section 7-1.01G, “Water Pollution,” of the Standard Specifications and these special provisions

Conformance with the requirements of this section shall in no way relieve the Contractor from the Contractor's responsibilities, as provided in Section 7-1.11, "Preservation of Property," and Section 7-1.12, "Responsibility for Damage," of the Standard Specifications.

Spill Contingency.--The Contractor shall prepare and submit to the Engineer a contingency plan for the management of spills or leaks of any materials or wastes that may impact the water quality of the San Francisco Bay.

The spill contingency plan shall be incorporated within the Storm Water Pollution Prevention Plan (SWPPP), as specified in “Water Pollution Control” of these special provisions.

The contingency plan shall include instructions and procedures for reporting spills, and a list of spill containment and collection materials and equipment to be maintained onsite. The contingency plan shall be reviewed and updated at least every 90 calendar days.

Liquids, Residues and Debris.--Attention is directed to “Remove Rivet,” “Concrete Structures,” “Drill and Bond Dowel (Epoxy Cartridge),” “Drill and Bond Dowels,” “Core Concrete,” “Core Concrete,” “Core and Bond Dowel (Epoxy Cartridge),” “Core and Pressure Grout Dowels,” “Clean and Paint Structurals Steel,” “Existing Highway Facilities,” and “Install Seismic Monitoring Casing” of these special provisions.

The control and disposal of liquids, residues, and debris associated with “Remove Rivet,” “Concrete Structures,” “Drill and Bond Dowel (Epoxy Cartridge),” “Drill and Bond Dowels,” “Core Concrete,” “Core Concrete,” “Core and Bond Dowel (Epoxy Cartridge),” “Core and Pressure Grout Dowels,” “Clean and Paint Structurals Steel,” “Existing Highway Facilities,” and “Install Seismic Monitoring Casing” shall be described within the SWPPP, as specified in “Water Pollution Control” of these special provisions. The SWPPP shall, at a minimum, depict and describe the procedural and structural methods of detaining, collecting, and disposing of all slurries, liquids, residues, and debris associated with the operations. Sufficient redundancy shall be incorporated into the procedural and structural methods such that the liquids, residues, and debris are not conveyed into or become present in drainage systems, San Francisco Bay, or other water bodies.

Measurement and Payment.--Full compensation for conforming to the requirements of this section shall be considered as included in the prices paid for the various contract items of work affected by this section and no additional compensation will be allowed therefor.

10-1.03 WATER POLLUTION CONTROL

Water pollution control work shall conform to the requirements in Section 7-1.01G, "Water Pollution," of the Standard Specifications and these special provisions.

This project shall conform to the requirements of Permit No. CAS029998 issued by the San Francisco Bay Regional (Region 2) Water Quality Control Board. This permit, hereafter referred to as the "Permit," regulates storm water discharges associated with construction activities.

Water pollution control work shall conform to the requirements in the Construction Contractor's Guide and Specifications of the Caltrans Storm Water Quality Handbooks, dated April 1997, and addenda thereto issued up to and including the date of advertisement of the project, hereafter referred to as the "Handbook". Copies of the Handbook may be obtained from the Department of Transportation, Material Operations Branch, Publication Distribution Unit, 1900 Royal Oaks Drive, Sacramento, California 95815, Telephone: (916) 445-3520.Copies of the Handbook, and the Permit are also available for review at 111 Grand Avenue, Oakland, California 94601. Please call the Toll Bridge Duty Senior, telephone number (510) 286-5549, to reserve a copy of the documents at least 24 hours in advance.

The Contractor shall become fully informed of and comply with the applicable provisions of the Handbook, Permit and Federal, State and local regulations that govern the Contractor's operations and storm water discharges from both the project site and areas of disturbance outside the project limits during construction. The Contractor shall maintain a copy of the Permit at the project site and shall make the Permit available during construction activities.

Unless arrangements for disturbance of areas outside the project limits are made by the Department and made part of the contract, it is expressly agreed that the Department assumes no responsibility to the Contractor or property owner whatsoever with respect to any arrangements made between the Contractor and property owner to allow disturbance of areas outside the project limits.

The Contractor shall be responsible for the costs and for any liability imposed by law as a result of the Contractor's failure to comply with the requirements set forth in this section "Water Pollution Control", including but not limited to, compliance with the applicable provisions of the Handbook, Permit and Federal, State and local regulations. For the purposes of this paragraph, costs and liabilities include, but are not limited to, fines, penalties and damages whether assessed against the State or the Contractor, including those levied under the Federal Clean Water Act and the State Porter Cologne Water Quality Act.

In addition to any remedy authorized by law, so much of the money due the Contractor under the contract that shall be considered necessary by the Department may be retained by the State of California until disposition has been made of the costs and liabilities.

The retention of money due the Contractor shall be subject to the following:

1. The Department will give the Contractor 30 days notice of its intention to retain funds from any partial payment which may become due to the Contractor prior to acceptance of the contract. Retention of funds from any payment made after acceptance of the contract may be made without prior notice to the Contractor.
2. No retention of additional amounts out of partial payments will be made if the amount to be retained does not exceed the amount being withheld from partial payments pursuant to Section 9-1.06, "Partial Payments," of the Standard Specifications.
3. If the Department has retained funds and it is subsequently determined that the State is not subject to the costs and liabilities in connection with the matter for which the retention was made, the Department shall be liable for interest on the amount retained at the legal rate of interest for the period of the retention.

Conformance with the requirements of this section "Water Pollution Control" shall not relieve the Contractor from the Contractor's responsibilities, as provided in Section 7-1.11, "Preservation of Property," and Section 7-1.12, "Responsibility for Damage," of the Standard Specifications.

The Contractor shall, at reasonable times, allow authorized agents of the California Regional Water Quality Control Board, State Water Resources Control Board, U. S. Environmental Protection Agency and local storm water management agency, upon the presentation of credentials and other documents as may be required by law, to:

1. Enter upon the construction site and the Contractor's facilities pertinent to the work;
2. Have access to and copy any records that must be kept as specified in the Permit;
3. Inspect the construction site and related soil stabilization practices and sediment control measures; and
4. Sample or monitor for the purpose of ensuring compliance with the Permit.

The Contractor shall notify the Engineer immediately upon request from regulatory agencies to enter, inspect, sample, monitor or otherwise access the project site or the Contractor's records.

STORM WATER POLLUTION PREVENTION PLAN PREPARATION, APPROVAL AND UPDATES.—As part of the water pollution control work, a Storm Water Pollution Prevention Plan, hereafter referred to as the "SWPPP," is required for this contract. The SWPPP shall conform to the requirements in Section 7-1.01G, "Water Pollution," of the Standard Specifications, the requirements in the Handbook, the requirements of the Permit and these special provisions. Upon the Engineer's approval of the SWPPP, the SWPPP shall be deemed to fulfill the requirements of Section 7-1.01G, "Water Pollution," of the Standard Specifications for development and submittal of a Water Pollution Control Program.

No work having potential to cause water pollution, as determined by the Engineer, shall be performed until the SWPPP has been approved by the Engineer.

Within 20 days after the approval of the contract, the Contractor shall submit 3 copies of the SWPPP to the Engineer. The Contractor shall allow 15 days for the Engineer to review the SWPPP. If revisions are required, as determined by the Engineer, the Contractor shall revise and resubmit the SWPPP within 10 days of receipt of the Engineer's comments and shall allow 10 days for the Engineer to review the revisions. Upon the Engineer's approval of the SWPPP, 3 additional copies of the SWPPP, incorporating the required changes, shall be submitted to the Engineer. Each copy of the SWPPP shall be provided in a three ring binder and contain a preparation date within the bottom margin of each page to the document. The binder shall display the title of the document, contract number, and Contractor's name.

The objectives of the SWPPP shall be to identify pollution sources that may adversely affect the quality of storm water discharges associated with the project and to identify, construct, implement and maintain water pollution control measures, hereafter referred to as control measures, to reduce to the extent feasible pollutants in storm water discharges from the construction site both during and after construction is completed under this contract.

The SWPPP shall incorporate control measures in the following categories:

1. Soil stabilization practices;
2. Sediment control practices;
3. Sediment tracking control practices;
4. Wind erosion control practices;
5. Non-storm water management; and
6. Waste management and disposal control practices.

Specific objectives and minimum requirements for each category of control measures are contained in the Handbook.

The Contractor shall consider the objectives and minimum requirements presented in the Handbook for each of the above categories. The special minimum requirements listed below supersede the minimum requirements listed in the Handbook for the same category. When minimum requirements are listed for any category, the Contractor shall incorporate into the SWPPP, and implement on the project, the listed minimum controls required in order to meet the pollution control objectives for the category. In addition, the Contractor shall consider other control measures presented in the Handbook and shall incorporate into the SWPPP and implement on the project the control measures necessary to meet the objectives of the SWPPP. The Contractor shall document the selection process in accordance with the procedure specified in the Handbook. The following special minimum requirements are established:

Category:	Minimum Requirements:
Non-Storm Water and Waste Management Controls	CD9(2) Structure Construction and Painting CD10(2) Material Delivery and Storage, CD11(2) Material Use, CD12(2) Spill Prevention and Control, CD13(2) Solid Waste Management, CD16(2) Concrete Waste Management, CD17(2) Sanitary/Septic Waste Management, CD18(2) Vehicle and Equipment Cleaning, CD19(2) Vehicle and Equipment Fueling, CD20(2) Vehicle and Equipment Maintenance, CD22(2) Scheduling, CD44(2) Illicit Discharge/Illegal Dumping Reporting, CD46(2) Liquid Waste Management
Erosion & Sediment Source Controls	CD26B(2) Geotextiles, Mats/Plastic Covers & Erosion Control Blankets
Wind Erosion Controls	CD26B(2) Geotextiles, Mats/Plastic Covers & Erosion Control Blankets
Sediment Treatment Controls	CD40(2) Storm Drain Inlet Protection

The SWPPP shall include, but not be limited to, the following items as described in the Handbook and Permit:

1. Source Identification;
2. Erosion and Sediment Controls;
3. Non-Storm Water Management;
4. Waste Management and Disposal;
5. Maintenance, Inspection and Repair;
6. Training;
7. List of Contractors and Subcontractors;

8. Post-Construction Storm Water Management;
9. Preparer;
10. Copy of the Local Permit;
11. BMP Consideration Checklist;
12. SWPPP Checklist;
13. Schedule of Values; and
14. Water Pollution Control Drawings.

The Contractor shall amend the SWPPP, graphically and in narrative form, whenever there is a change in construction activities or operations which may affect the discharge of significant quantities of pollutants to surface waters, ground waters, municipal storm drain systems, or when deemed necessary by the Engineer. The SWPPP shall also be amended if it is in violation of any condition of the Permit, or has not effectively achieved the objective of reducing pollutants in storm water discharges. Amendments shall show additional control measures or revised operations, including those in areas not shown in the initially approved SWPPP, which are required on the project to control water pollution effectively. Amendments to the SWPPP shall be submitted for review and approval by the Engineer in the same manner specified for the initially approved SWPPP. Approved amendments shall be dated and logged in the SWPPP. Upon approval of the amendment, the Contractor shall implement the additional control measures or revised operations.

The Contractor shall keep a copy of the SWPPP and approved amendments at the project site. The SWPPP shall be made available upon request of a representative of the Regional Water Quality Control Board, State Water Resources Control Board, U.S. Environmental Protection Agency or local storm water management agency. Requests by the public shall be directed to the Engineer.

By June 15 of each year, the Contractor shall submit an annual certification to the Engineer stating compliance with the requirements governing the Permit. If the project is in non-compliance at any time, the Contractor shall make a written report to the Engineer within 48 hours of identification of non-compliance.

SCHEDULE OF VALUES.—The Contractor shall submit with the SWPPP, for approval by the Engineer, a schedule of values detailing the cost breakdown of the contract lump sum item for water pollution control. The schedule of values shall reflect the items of work, quantities and costs for control measures shown in the SWPPP, except for critical temporary controls and permanent control measures which are shown on the project plans and for which there is a contract item of work. Adjustments in the items of work and quantities listed in the schedule of values shall be made when required to address approved amendments to the SWPPP.

The sum of the amounts for the units of work listed in the schedule of values shall be equal to the contract lump sum price for water pollution control.

If approved in writing by the Engineer, the schedule of values will be used to determine progress payments for water pollution control during the progress of the work, and as the basis for calculating any adjustment in compensation for the contract item for water pollution control due to changes in the work ordered by the Engineer.

SWPPP IMPLEMENTATION.—Upon approval of the SWPPP, the Contractor shall be responsible throughout the duration of the project for installing, constructing, inspecting and maintaining the control measures included in the SWPPP and any amendments thereto and for removing and disposing of temporary control measures. Unless otherwise directed by the Engineer or specified in these special provisions, the Contractor's responsibility for SWPPP implementation shall continue throughout any temporary suspension of work ordered in accordance with Section 8-1.05, "Temporary Suspension of Work," of the Standard Specifications. Requirements for installation, construction, inspection, maintenance, removal and disposal of control measures are specified in the Handbook and these special provisions.

Soil stabilization practices and sediment control measures, including minimum requirements, shall be provided throughout the winter season, defined as between September 15 and May 1.

Implementation of soil stabilization practices and sediment control measures for soil-disturbed areas of the project site shall be completed, except as provided for below, no later than 20 days prior to the beginning of the winter season or upon start of applicable construction activities for projects which begin either during or within 20 days of the winter season.

Throughout the winter season, the active, soil-disturbed area of the project site shall be no more than 2.5 acres. The Engineer may approve, on a case-by-case basis, expansions of the active, soil-disturbed area limit. The Contractor shall demonstrate the ability and preparedness to fully deploy soil stabilization practices and sediment control measures to protect soil-disturbed areas of the project site before the onset of precipitation. The Contractor shall maintain a quantity of soil stabilization and sediment control materials on site equal to 125 percent of that sufficient to protect unprotected,

soil-disturbed areas on the project site and shall maintain a detailed plan for the mobilization of sufficient labor and equipment to fully deploy control measures required to protect unprotected, soil-disturbed areas on the project site prior to the onset of precipitation. The Contractor shall include a current inventory of control measure materials and the detailed mobilization plan as part of the SWPPP.

Throughout the winter season, soil-disturbed areas of the project site shall be considered to be nonactive whenever soil disturbing activities are expected to be discontinued for a period of 5 or more days and the areas are fully protected. Areas that will become nonactive either during the winter season or within 20 days thereof shall be fully protected with soil stabilization practices and sediment control measures within 10 days of the discontinuance of soil disturbing activities or prior to the onset of precipitation, whichever is first to occur.

Throughout the winter season, active soil-disturbed areas of the project site shall be fully protected at the end of each day with soil stabilization practices and sediment control measures unless fair weather is predicted through the following work day. The weather forecast shall be monitored by the Contractor on a daily basis. The National Weather Service forecast shall be used, or an alternative weather forecast proposed by the Contractor may be used if approved by the Engineer. If precipitation is predicted prior to the end of the following work day, construction scheduling shall be modified, as required, and the Contractor shall deploy functioning control measures prior to the onset of the precipitation.

The Contractor shall implement, year-round and throughout the duration of the project, control measures included in the SWPPP for sediment tracking, wind erosion, non-storm water management and waste management and disposal.

The Engineer may order the suspension of construction operations which create water pollution if the Contractor fails to conform to the requirements of this section "Water Pollution Control" as determined by the Engineer.

MAINTENANCE.—To ensure the proper implementation and functioning of control measures, the Contractor shall regularly inspect and maintain the construction site for the control measures identified in the SWPPP. The Contractor shall identify corrective actions and time frames to address any damaged measures or reinitiate any measures that have been discontinued.

A construction site inspection checklist will be provided by the Engineer. It shall be used to ensure that the necessary measures are being properly implemented, and to ensure that the control measures are functioning adequately. The Contractor shall submit one copy of each site inspection record to the Engineer.

Inspections of the construction site shall be conducted by the Contractor to identify deficient measures, as follows:

1. Prior to a forecast storm;
2. After each storm event;
3. At 24 hour intervals during extended precipitation events; and
4. Routinely, on a weekly basis.

If the Contractor or the Engineer identifies a deficiency in the deployment or functioning of an identified control measure, the deficiency shall be corrected by the Contractor immediately, or by a later date and time if requested by the Contractor and approved by the Engineer in writing, but not later than the onset of subsequent precipitation events. The correction of deficiencies shall be at no additional cost to the State.

PAYMENT.—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 for doing all the work involved in developing, preparing, obtaining approval of, revising and amending the SWPPP as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Attention is directed to Sections 9-1.06, "Partial Payments," and 9-1.07, "Payment After Acceptance," of the Standard Specifications. Payments for prepare storm water pollution prevention plan will be made as follows:

1. After the SWPPP has been approved by the Engineer, 75 percent of the contract item price for prepare storm water pollution prevention plan will be included in the monthly partial payment estimate; and
2. After acceptance of the contract pursuant to Section 7-1.17, "Acceptance of Contract," the remaining 25 percent of the contract item price for prepare storm water pollution prevention plan will be made in accordance with Section 9-1.07.

The contract lump sum price paid for water pollution control shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all the work involved in installing, constructing, maintaining, removing and disposing of control measures, except those shown on the project plans and for which there is a contract

item of work, and excluding developing, preparing, obtaining approval of, revising and amending the SWPPP, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Changes in control measures required by an approved amendment to the SWPPP, except changes to those control measures shown on the project plans and for which there is a contract item of work, will be considered extra work, in accordance with Section 4-1.03D of the Standard Specifications and the following:

If the control measure is listed in the approved SWPPP schedule of values, an adjustment in compensation for the contract item for water pollution control will be made by applying the increase or decrease in quantities to the approved schedule of values. No adjustment of compensation will be made to the unit price listed for any item in the schedule of values due to any increase or decrease in the quantities, regardless of the reason for the increase or decrease. The provisions in Section 4-1.03B, "Increased or Decreased Quantities," shall not apply to items listed in the schedule of values.

If the control measure is not listed in the approved SWPPP schedule of values, payment will be made by force account.

Those control measures which are shown on the project plans and for which there is a contract item of work will be measured and paid for as that item of work.

The Engineer will retain an amount equal to 25 percent of the estimated value of the contract work performed during estimate periods in which the Contractor fails to conform to the requirements of this section "Water Pollution Control" as determined by the Engineer.

Retentions for failure to conform to the requirements of this section "Water Pollution Control" shall be in addition to the other retentions provided for in the contract. The amounts retained for failure of the Contractor to conform to the requirements of this section will be released for payment on the next monthly estimate for partial payment following the date that an approved SWPPP has been implemented and maintained, and water pollution is adequately controlled, as determined by the Engineer.

WATER POLLUTION CONTROL SCHEDULE OF VALUES

Contract No. 04 - 0435U4

UNIT DESCRIPTION	UNIT	QUANTITY	VALUE	AMOUNT
CD9(2) STRUCTURE CONSTRUCTION AND PAINTING	LS	LUMP SUM		
CD10(2) MATERIAL DELIVERY AND STORAGE	LS	LUMP SUM		
CD11(2) MATERIAL USE	LS	LUMP SUM		
CD12(2) SPILL PREVENTION AND CONTROL	LS	LUMP SUM		
CD13(2) SOLID WASTE MANAGEMENT	LS	LUMP SUM		
CD16(2) CONCRETE WASTE MANAGEMENT	LS	LUMP SUM		
CD17(2) SANITARY / SEPTIC WASTE MANAGEMENT	LS	LUMP SUM		
CD18(2) VEHICLE AND EQUIPMENT CLEANING	LS	LUMP SUM		
CD19(2) VEHICLE AND EQUIPMENT FUELING	LS	LUMP SUM		
CD20(2) VEHICLE AND EQUIPMENT MAINTENANCE	LS	LUMP SUM		
CD22(2) SCHEDULING	LS	LUMP SUM		
CD26B(2) GEOTEXTILES, MATS/PLASTIC COVERS & EROSION CONTROL BLANKETS	SQ.YD.			
CD40(2) STORM DRAIN INLET PROTECTION	EA			
CD44(2) ILLICIT DISCHARGE / ILLEGAL DUMPING REPORTING	LS	LUMP SUM		
CD46(2) LIQUID WASTE MANAGEMENT	LS	LUMP SUM		

TOTAL _____

10-1.04 COOPERATION

Attention is directed to Sections 7-1.14, "Cooperation," and 8-1.10, "Utility and Non-Highway Facilities," of the Standard Specifications and these special provisions.

In the event of a loss caused to the Contractor due to unnecessary delays or failure to finish the work within the time specified for completion caused by another contractor under contract with the Department performing work for the State, the State will reimburse the delayed contractor in conformance with the provisions in Section 8-1.09, "Right of Way Delays," of the Standard Specifications. Deductions will be made from any moneys due or that may become due to the contractor causing the loss or delay.

It is anticipated that work will be in progress by other contractors within or adjacent to the project limits of this contract.

Contracts which may be in progress during the working period of this contract include but are not necessarily limited to the following:

Contract No. 04-043544. Work is located on Route 80 on the San Francisco-Oakland Bay Bridge from Pier W-2 to Pier W-6. This is a seismic retrofit of the pier foundations. Construction is scheduled for Winter 1998.

Contract No. 04-043554. Work is located on Route 80 on the San Francisco-Oakland Bay Bridge from the San Francisco Anchorage to the Yerba Buena Anchorage. This is a seismic retrofit of the anchorages. Construction is scheduled for Spring 1999.

Contract No. 04-043474. Work is located on Route 80 on the San Francisco-Oakland Bay Bridge at the Yerba Buena Island Tunnel approach. This is a seismic retrofit project. Construction is scheduled for Spring 1998.

Contract No. 04-044504. Work is located on Route 80 on the San Francisco-Oakland Bay Bridge. This is a crack sealing project at Pier W-1. Construction is scheduled for Fall 1998.

Contract No. 04-133334. Work is located on Route 80 between Forth Street and the San Francisco Anchorage. This is a seismic retrofit project of the San Francisco-Oakland Bay Bridge approach. Construction is scheduled for Summer 1999.

Contract No. 04-0434L4. Work is located on Route 80 on the San Francisco-Oakland Bay Bridge at the Yerba Buena Island Tunnel. This is a seismic retrofit project. Construction is scheduled for Summer 1999.

Contract No. 04-043004. Work is located on Route 80 on the San Francisco-Oakland Bay Bridge east of the Yerba Buena Island Tunnel. This is a seismic retrofit project. Construction is scheduled for Spring 1998.

Work by State forces will be in progress within the contract limits during the working period for maintenance operations.

Progress schedules for other work in progress, if available, may be inspected by the Contractor upon approval by the Engineer. Such progress schedules are tentative and cannot be guaranteed accurate.

The Contractor shall participate in weekly work planning meetings with the Engineer for the purpose of coordinating his work with the work of other Contractors, State and other agency forces. The Contractor shall be prepared to discuss at least the future three weeks of scheduled work. The Contractor shall comply with all security policies of the State concerning the San Francisco-Oakland Bay Bridge.

The Contractor's cooperation and attention is directed to the provisions in "Obstructions," elsewhere in these special provisions regarding Pacific Bell or their contractor's temporary relocation of two fiber optic telephone cables.

10-1.05 PROGRESS SCHEDULE (CRITICAL PATH)

Progress schedules will be required for this contract. Progress schedules shall utilize the Critical Path Method (CPM).

Definitions - The following definitions apply to this section "Progress Schedule (Critical Path)":

1. Activity: Any task, or portion of a project, which takes time to complete.
2. Baseline Schedule: The initial CPM schedule representing the Contractor's original work plan, as accepted by the Engineer.
3. Controlling Operation: The activity considered at the time by the Engineer, within that series of activities defined as the critical path, which, if delayed or prolonged, will delay the time of completion of the contract.
4. Critical Path: The series of activities which determines the earliest completion of the project (Forecast completion Date). Those activities with float less than or equal to a specified value, often zero.

5. Critical Path Method: A mathematical calculation to determine the earliest completion of the project represented by a graphic representation of the sequence of activities that shows the interrelationships and interdependencies of the elements composing a project.
6. Current Contract Completion Date: The extended date for completion of the contract shown on the weekly statement of working days furnished by the Engineer in accordance with Section 8-1.06, "Time of Completion," of the Standard Specifications.
7. Early Completion Time: The difference in time between the current contract completion date and the Contractor's scheduled early forecast completion date as shown on the accepted baseline schedule, or schedule updates and revisions.
8. Float: The amount of time between the early start date and the late start date, or the early finish date and the late finish date, of any activity or group of activities in the network.
9. Forecast Completion Date: The completion date of the last scheduled work activity identified on the critical path.
10. Fragnet: A section or fragment of the network diagram comprised of a group of activities.
11. Free Float: The amount of time an activity can be delayed before affecting a subsequent activity.
12. Hammock Activity: An activity added to the network to span an existing group of activities for summarizing purposes.
13. Milestone: A marker in a network, which is typically used to mark a point in time or denote the beginning or end of a sequence of activities. A milestone has zero duration, but will otherwise function in the network as if it were an activity.
14. Revision: A change in the future portion of the schedule that modifies logic, adds or deletes activities, or alters activities, sequences, or durations.
15. Tabular Listing: A report showing schedule activities, their relationships, durations, scheduled and actual dates, and float.
16. Total Float: The amount of time that an activity may be delayed without affecting the total project duration of the critical path.
17. Update: The modification of the CPM progress schedule through a regular review to incorporate actual progress to date by activity, approved time adjustments, and projected completion dates.

Preconstruction Scheduling Conference - The Engineer will schedule and conduct a Preconstruction Scheduling Conference with the Contractor's Project Manager and Construction Scheduler within seven days after the bidder has received the contract for execution. At this meeting, the requirements of this section of the special provisions will be reviewed with the Contractor. The Contractor shall be prepared to discuss its schedule methodology, proposed sequence of operations, the activity identification system for labeling all work activities, and any deviations it proposes to make from the Stage Construction Plans. The Engineer shall submit a diskette of a scheduling shell project, displaying a generic activity code dictionary consisting of fields populated with the Caltrans Scope Breakdown Structure Code. The Contractor shall utilize these codes, and may add other codes as necessary, to group and organize the work activities. Periodically the Engineer may request the Contractor to utilize additional filters, layouts or activity codes to be able to further group or summarize work activities.

Also, the Engineer and the Contractor shall review the requirements for all submittals applicable to the contract and discuss their respective preparation and review durations. All submittals are to be reflected on the Interim Baseline Schedule and the Baseline Schedule.

Interim Baseline Schedule - Within 15 days after approval of the contract, the Contractor shall submit to the Engineer an interim baseline project schedule which will serve as the progress schedule for the first 120 days of the project, or until the baseline schedule is accepted, whichever is sooner. The interim baseline schedule shall utilize the critical path method. The interim baseline schedule shall depict how the Contractor plans to perform the work for the first 120 days of the contract. Additionally, the interim baseline schedule shall show all submittals required early in the project, and shall provide for all permits, and other non-work activities necessary to begin the work. The interim baseline schedule submittal shall include a 3 l/2 inch floppy diskette which contains the data files used to generate the schedule.

The Engineer shall be allowed 10 days to review the schedule and to provide comments, including the Contractor’s application of the supplied scope breakdown structure. The interim baseline schedule does not require Caltrans approval but all comments are to be implemented into the baseline schedule. Resubmittal of the interim baseline schedule is not required. Late review of the interim baseline schedule shall not restrain the submittal of the baseline schedule.

Baseline Schedule - Within 30 days after approval of the contract, the Contractor shall submit to the Engineer a baseline project schedule including the incorporation of all comments provided to the interim baseline schedule. The baseline project schedule shall have a data date of the day prior to the first working day of the contract and shall not include any completed work to-date. The baseline progress schedule shall meet interim target dates, milestones, stage construction requirements, internal time constraints, show logical sequence of activities, and must not extend beyond the number of days originally provided for in the contract.

The baseline CPM schedule submitted by the Contractor shall have a sufficient number of activities to assure adequate planning of the project and to permit monitoring and evaluation of progress and the analysis of time impacts. The baseline schedule shall depict how the Contractor plans to complete the whole work involved, and shall show all activities that define the critical path.

The baseline progress schedule shall be supplemented with resource allocations for every activity, to a level of detail that facilitates report generation based on labor craft and equipment class for the Contractor and subcontractors. The Contractor shall use average composite crews to display the labor loading of on-site construction activities. The Contractor shall optimize and level labor to reflect a reasonable plan for accomplishing the work of the contract and to assure that resources are not duplicated in concurrent activities. The Contractor shall require each subcontractor to submit in writing a statement certifying that the subcontractor has concurred with the Contractor's CPM, including major updates, and that the subcontractor's related schedule has been incorporated accurately, including the duration of activities and labor and equipment loading. Along with the baseline progress schedule, the Contractor shall also submit to the Engineer time-scaled resource histograms of the labor crafts and equipment classes to be utilized on the contract. The baseline schedule submittal shall include a 3 l/2 inch floppy diskette which contains the data files used to generate the schedule.

The Engineer shall be allowed 15 days to review and accept or reject the baseline project schedule submitted. Rejected schedules shall be resubmitted to the Engineer within 5 days, at which time a new 15 day review period by the Engineer will begin.

Project Schedule Reports - Schedules submitted to the Engineer including baseline and interim baseline schedules shall include time scaled network diagrams in a layout format requested by the Engineer. The network diagrams submitted to the Engineer shall also be accompanied by four computer-generated mathematical analysis tabular reports for each activity included in the project schedule. The reports (8 1/2" x 11" size) shall include a network diagram report showing the activity columns only, a predecessor and successor report, a resource report, and a scheduling and leveling calculation report. The network diagram report shall include the following for each activity:

1) Activity number and description;
2) Activity codes;
3) Original, actual and remaining durations;
4) Earliest start date (by calendar date);
5) Earliest finish date (by calendar date);
6) Actual start date (by calendar date);
7) Actual finish date (by calendar date);
8) Latest start date (by calendar date);
9) Latest finish date (by calendar date);
10) Identify activity calendar ID
11) Total Float and Free Float, in work days; and
12) Percentage of activity complete and remaining duration for incomplete activities.;

Network~~s~~ diagrams shall be sorted and grouped in a format requested by the Engineer reflecting the project breakdown per the Caltrans scope breakdown structure codes. They shall be drafted time scaled to show a continuous flow of information from left to right per the project sorting and grouping. E.g., the schedule, from top to bottom, shall be grouped by project milestones, submittals subgrouped by description, and the construction activities subgrouped by the scope breakdown structure. The primary paths of criticality shall be clearly and graphically identified on the networks. The network diagram shall be prepared on E-size sheets (36" x 48"), shall have a title block in the lower right-hand corner, and a timeline on each page. Exceptions to the size of the network sheets and the use of computer graphics to generate the networks shall be subject to the approval of the Engineer.

Schedule network diagrams and the tabular reports shall be submitted to the Engineer for acceptance in the following quantities:

a) 2 sets of the Network Diagrams;
b) 2 copies of the tabular reports (8 1/2" x 11" size); and
c) 3 computer diskettes.

Should the baseline schedule or schedule update, submitted for acceptance, show variances from the requirements of the contract, the Contractor shall make specific mention of the variations in the letter of transmittal, in order that, if accepted, proper adjustments to the project schedule can be made. The Contractor will not be relieved of the responsibility for executing the work in strict accordance with the requirements of the contract documents. In the event of a conflict between the requirements of the contract documents and the information provided or shown on an accepted schedule, the requirements of the contract documents shall take precedence.

Each schedule submitted to the Engineer shall comply with all limits imposed by the contract, with all specified intermediate milestone and completion dates, and with all constraints, restraints or sequences included in the contract. The degree of detail shall include factors including, but not limited to:

1) Physical breakdown of the project;
2) Contract milestones and completion dates, substantial completion dates, constraints, restraints, sequences of work shown in the contract, the planned substantial completion date, and the final completion date;
3) Type of work to be performed, the sequences, and the major subcontractors involved;
4) All purchases, submittals, submittal reviews, manufacture, tests, deliver, and installation activities for all major materials and equipment.
5) Preparation, submittal and approval of shop and working drawings and material samples, showing time, as specified elsewhere, for the Engineer's review. The same time frame shall be allowed for at least one resubmittal on all major submittals so identified in the contract documents;
6) Identification of interfaces and dependencies with preceding, concurrent and follow-on contractors, railroads, and utilities as shown on the plans or specified in the specifications;
7) Identification of each and every utility relocation and interface as a separate activity, including activity description and responsibility coding that identifies the type of utility and the name of the utility company involved.
8) Actual tests, submission of test reports, and approval of test results;
9) All start-up, testing, training, and assistance required under the Contract;
10) Punchlist and final clean-up;
11) Identification of any manpower, material, or equipment restrictions, as well as any activity requiring unusual shift work, such as double shifts, 6-day weeks, specified overtime, or work at times other than regular days or hours; and
12) Identification of each and every ramp closing and opening event as a separate one-day activity, including designation by activity coding and description that it is a north-bound, south-bound, east-bound, west-bound, and entry or exit ramp activity.

Each construction activity shall have a duration of not more than 20 working days, and not less than one working day unless permitted otherwise by the Engineer. All activities in the schedule, with the exception of the first and last activities, shall have a minimum of one predecessor and a minimum of one successor. The baseline schedule shall not attribute negative float to any activity. Float shall not be considered as time for the exclusive use of or benefit of either the State or the Contractor but shall be considered as a jointly owned, expiring resource available to the project and shall not be used to the financial detriment of either party. The Contractor shall not add job inefficiencies or weather days to a project calendar without prior approval by the Engineer. Any accepted schedule, revision or update having an early completion date shall show the time between the early completion date and the current Contract Completion Date as "project float".

The Contractor shall be responsible for assuring that all work sequences are logical and the network shows a coordinated plan for complete performance of the work. Failure of the Contractor to include any element of work required for the performance of the contract in the network shall not relieve the Contractor from completing all work within the time limit specified for completion of the contract. If the Contractor fails to define any element of work, activity or logic, and the omission or error is discovered by either the Contractor or the Engineer, it shall be corrected by the Contractor at the next monthly update or revision of the schedule.

Weekly Schedule Meetings – The Engineer and the Contractor shall hold weekly scheduling meetings to discuss the near term schedule activities, to address any long-term schedule issues, and to discuss any relevant technical issues. The Contractor shall develop a rolling 3-week schedule identifying the current week and a 2-week look ahead. It shall provide sufficient detail to address all activities to be performed and to identify issues requiring engineering action or input. Also, the Engineer shall maintain a critical item list identifying each issue, the project impact, the responsible party, and a scheduled resolution date. The list shall be developed with input from the Contractor and shall prioritize each issue in order to mitigate any schedule or cost impact to the project.

Monthly Update Schedules - The Contractor shall submit a Monthly Update Schedule to the Engineer once in each month. The proposed update schedule prepared by the Contractor shall include all information available as of the 20th calendar day of the month, or other date as established by the Engineer. A detailed list of all proposed schedule changes such as logic, duration, lead/lag, forecast completion date, additions and deletions shall be submitted with the update.

The monthly update schedule submitted to the Engineer shall be accompanied by a Schedule Narrative Report. The Schedule Narrative Report shall describe the physical progress during the report period, plans for continuing the work during the forthcoming report period, actions planned to correct any negative float, and an explanation of potential delays or problems and their estimated impact on performance, milestone completion dates, forecast completion date, and the overall project completion date. In addition, alternatives for possible schedule recovery to mitigate any potential delay or cost increases shall be included for consideration by the Engineer. The report shall follow the outline set forth below:

Contractor's Schedule Narrative Report Outline:

1) Contractor's Transmittal Letter
2) Work completed during the period
3) Description of the current critical path
4) Description of problem areas
5) Current and anticipated delays
    a) Cause of the delay
    b) Corrective action and schedule adjustments to correct the delay
    c) Impact of the delay on other activities, milestones, and completion dates
6) Changes in construction sequences
7) Pending items and status thereof
    a) Permits
    b) Change Orders
    c) Time Extensions
    d) Non-Compliance Notices
8) Contract completion date(s) status
    a) Ahead of schedule and number of days
    b) Behind schedule and number of days
9) Include updated Network Diagram and Reports

The Contractor shall provide to the Engineer a 31/2” electronic disk of the schedule, together with printed copies of the network diagrams and tabular reports described under "Project Schedule Reports", and the Schedule Narrative Report.

The monthly update of the schedule shall be for the period from the last update to the current cut-off date, and for the remainder of the project. The current period's activities shall be reported as they actually took place and designated as actually complete, if actually completed, in the schedule updates.

Portions of the network diagram on which all activities are complete need not be reprinted and submitted in subsequent updates. However, the electronic disk file of the submitted schedule and the related reports shall constitute a clear record of progress of the work from award of contract to final completion.

The Contractor will be permitted to show a forecast completion date on the schedule updates and revisions. The Engineer may use the updates and revisions, and other information available, in evaluating the effect of changes, delays, or time savings on the critical path and the accepted schedule current at the time to determine if there is an applicable adjustment of time, if any, to any target date or completion date due to the changes, delays, or time savings.

On a date determined by the Engineer, the Contractor shall meet with the Engineer to review the monthly schedule update. At the monthly progress meeting, the Contractor and the Engineer will review the updated schedule and will discuss the content of the Narrative Report. The Engineer shall be allowed 15 days after the meeting to review and accept or reject the update schedule submitted. Rejected schedules shall be resubmitted to the Engineer within 10 days, at which

time a new 7-day review period by the Engineer will begin. All efforts shall be made between the Engineer and the Contractor to complete the review and the approval process prior to the next update schedule cutoff date. To expedite the process a second meeting between the Engineer and the Contractor shall be held.

Schedule Revisions - If the Contractor desires to make a change to the accepted schedule, the Contractor shall request permission from the Engineer in writing, stating the reasons for the change, and proposed revisions to activities, logic and duration. The Contractor shall submit for acceptance an analysis showing the effect of the revisions on the entire project. The analysis shall include:

1. An updated schedule not including the revisions. The schedule shall have a data date just prior to implementing the proposed revisions and include a project completion date;
2. A revised schedule that includes the proposed revisions. The schedule shall have the same data date as the updated schedule and include a project completion date;
3. A narrative explanation of the revisions and their impact to the schedule; and
4. Computer files of the updated and revised schedules.

The Engineer will provide a response within 10 days. No revision to the accepted baseline schedule or the schedule updates shall be made without the prior written approval of the Engineer.

The Engineer will request the Contractor to submit a proposed revised schedule within 15 days when:

a) there is a significant change in the Contractor's operations that will affect the critical path;
b) the current updated schedule indicates that the contract progress is 30 days or more behind the planned schedule, as determined by the Engineer; or
c) the Engineer determines that an approved or anticipated change will impact the critical path, milestone or completion dates, contract progress, or work by other contractors.

The Engineer shall be allowed 15 days to review and accept or reject a schedule revision. Rejected schedule revisions shall be revised and resubmitted to the Engineer within 15 days, at which time a new 15 day review period by the Engineer will begin. Only upon approval of a change by the Engineer shall it be reflected in the next schedule update submitted by the Contractor.

Schedule Time Extension Requests - When the Contractor requests a time extension due to contract change orders or delays, the Contractor shall submit to the Engineer a written Time Impact Analysis illustrating the influence of each change or delay on the current contract completion date or milestone completion date, utilizing the current accepted schedule. Each Time Impact Analysis shall include a fragnet demonstrating how the Contractor proposes to incorporate the Change Order or delay into the current schedule. The fragnet shall include the sequence of new and existing activity revisions that are proposed to be added to the accepted baseline project schedule or current schedule in effect at the time the change or delay is encountered, to demonstrate the influence of the delay and the proposed method for incorporating the delay and its impact into the schedule.

Each Time Impact Analysis shall demonstrate the estimated time impact based on the events of delay, the anticipated or actual date of the contract change order work performance, the status of construction at that point in time, and the event time computation of all activities affected by the change or delay. The event times used in the analysis shall be those included in the latest update of the current schedule in effect at the time the change or delay was encountered.

Time extensions will be granted only to the extent that equitable time adjustments for the activity or activities affected exceed the total or remaining float along the critical path of activities at the time of actual delay, or at the time the contract change order work is performed. Float time is not for the exclusive use or benefit of the Engineer or the Contractor, but is an expiring resource available to all parties as needed to meet contract milestones and the contract completion date. Time extensions will not be granted nor will delay damages be paid unless:

a) the delay is beyond the control and without the fault or negligence of the Contractor and its subcontractors or suppliers, at any tier; and,
b) the delay extends the actual performance of the work beyond the applicable current contract completion date and the most recent date predicted for completion of the project on the accepted schedule update current as of the time of the delay or as of the time of issuance of the contract change order.

Time Impact Analyses shall be submitted in triplicate within 15 days after the delay occurs or after issuance of the contract change order.

Approval or rejection of each Time Impact Analysis by the Engineer will be made within 15 days after receipt of the Time Impact Analysis, unless the review is delayed by subsequent meetings and negotiations. A copy of the Time Impact Analysis approved by the Engineer shall be returned to the Contractor and the accepted schedule revisions illustrating the influence of the contract change orders or delays shall be incorporated into the project schedule during the first update after approval.

Final Schedule Update - Within 15 days after the acceptance of the contract by the Director, the Contractor shall submit a final update of the schedule with actual start and actual finish dates for all activities. This schedule submission shall be accompanied by a certification, signed by an officer of the company and the Contractor's Project Manager stating "To the best of my knowledge, the enclosed final update of the project schedule reflects the actual start and completion dates of the activities contained herein."

Equipment and Software - The Contractor shall provide for the State's exclusive possession and use a complete computer system specifically capable of creating, storing, updating and producing CPM schedules. Before delivery and setup of the computer system, the Contractor shall submit to the Engineer for approval a detailed list of all computer hardware and software the Contractor proposes to furnish. The minimum computer system to be furnished shall include the following:

1) Complete computer system, including keyboard, mouse, 17 inch color SVGA monitor (1,024x768 pixels), Intel Pentium 266 MHz micro processor chip, or equivalent, or better;

2) Computer operating system software, compatible with the selected processing unit, for Windows ~~95~~ 98 or later, or equivalent;

3) Minimum sixty-four (64) megabytes of random access memory (RAM);

4) A 3.2 gigabyte minimum hard disk drive, a 1.44 megabyte 3 l/2 inch floppy disk drive, 32x speed minimum CD-ROM drive, Ethernet card and 56 k modem;

5) A color-ink-jet plotter with a minimum ~~8~~ 36 megs RAM, capable of 300 dots per inch color, 600 dots per inch monochrome, or equivalent plotter capable of printing fully legible, timescaled charts, and network diagrams, in four colors, with a minimum size of 36 inches by 48 inches (E size) and is compatible with the selected system. All required plotter paper and ink cartridges throughout the contract;

6) CPM software shall be Primavera Project Planner, the latest version for Windows 95, or later; and

7) Schedule Analyzer – a software to compare two different Primavera schedule updates to analyze their similarities and differences. The latest version for Windows 95, or later.

The computer hardware and software furnished shall be compatible with that used by the Contractor for the production of the CPM progress schedule required by the Contract, and shall include original instruction manuals and other documentation normally provided with the software.

The Contractor shall furnish, install, set up, maintain and repair the computer hardware and software ready for use at a location determined by the Engineer. The hardware and software shall be installed and ready for use by the first submission of the baseline schedule. The Contractor shall provide 24 hours of formal training for the Engineer in the use of the hardware and software to include schedule analysis, reporting, resource and cost allocations.

All computer hardware and software furnished shall remain the property of the Contractor and shall be removed by the Contractor upon acceptance of the contract when no claims involving contract progress are pending. When claims involving contract progress are pending, computer hardware or software shall not be removed until the final estimate has been submitted to the Contractor.

Payment - Progress schedule (critical path) will be paid for at a lump sum price. The contract lump sum price paid for progress schedule (critical path) shall include full compensation for furnishing all labor, materials (including computer hardware and software), tools, equipment, and incidentals; and for doing all the work involved in preparing, furnishing, updating and revising CPM progress schedules; maintaining and repairing the computer hardware; and training the Engineer in the use of the computer hardware and software; as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Payments for progress schedule (critical path) will be made as follows:

Interim baseline schedule accepted, then 10 percent payment for progress schedule (critical path) will be made.

Baseline schedule accepted, then 10 percent payment for progress schedule (critical path) will be made.

Monthly update schedules accepted, then 75 percent payment for progress schedule (critical path) will be made equally for each update.

Final schedule update accepted, then 5 percent payment for progress schedule (critical path) will be made.

The Department will retain an amount equal to 25 percent of the estimated value of the work performed during the first estimate period in which the Contractor fails to submit an interim baseline, baseline, revised or updated CPM schedule conforming to the requirements of this section, as determined by the Engineer. Thereafter, on subsequent successive estimate periods the percentage the Department will retain will be increased at the rate of 25 percent per estimate period in which acceptable CPM progress schedules have not been submitted to the Engineer. Retentions for failure to submit acceptable CPM progress schedules shall be additional to all other retentions provided for in the contract. The retention for failure to submit acceptable CPM progress schedules will be released for payment on the next monthly estimate for partial payment following the date that acceptable CPM progress schedules are submitted to the Engineer.

The adjustment provisions in Section 4-1.03, "Changes," of the Standard Specifications, shall not apply to the item of progress schedule (critical path). Adjustments in compensation for the project schedule will not be made for any increased or decreased work ordered by the Engineer in furnishing project schedules.

10-1.06 ELECTRONIC MOBILE DAILY DIARY SYSTEM DATA DELIVERY

Attention is directed to Sections 5-1.10, "Equipment and Plants," and 7-1.01A(3), "Payroll Records," of the Standard Specifications, and these special provisions.

The Contractor shall submit to the Engineer a list of each piece of equipment and its identifying number, type, make, model and rate code in accordance with the Department of Transportation publication entitled "Labor Surcharge and Equipment Rental Rate" which is in effect on the date upon the work is performed, and the names, labor rates and work classifications for all field personnel employed by the Contractor and all subcontractors in connection with the public work, together with such additional information as is identified below. This information shall be updated and submitted to the Engineer weekly through the life of the project.

This personnel information will only be used for this mobile daily diary computer system and it will not relieve the Contractor and subcontractors from all the payroll records requirements as required by Section 7-1.01A(3), "Payroll Records," of the Standard Specifications.

The Contractor shall provide the personnel and equipment information not later than 11 days after the contract award for its own personnel and equipment, and not later than 5 days before start of work by any subcontractor for the labor and equipment data of that subcontractor.

The minimum data to be furnished shall comply with the following specifications:

Data Content Requirements.--

1. The Contractor shall provide the following basic information for itself and for each subcontractor that will be used on the contract:

Company name.	Alphanumeric; up to 30 characters.
Company type (prime or sub)	Alphanumeric; up to 10 characters.
Address (line 1).	Alphanumeric; up to 30 characters.
Address (line 2).	Alphanumeric; up to 30 characters.
Address (city).	Alphanumeric; up to 30 chars.
Address (2-letter state code).	Alphanumeric; up to 2 characters.
Address (zip code)	Alphanumeric; up to 14 characters.
Contact name.	Alphanumeric; up to 30 characters
Telephone number (with area code).	Alphanumeric; up to 20 characters.
Company code: short company name.	Alphanumeric; up to 10 characters.
Type of work (Department-supplied codes)	Alphanumeric; up to 30 characters
DBE status (Department-supplied codes)	Alphanumeric; up to 20 characters.
Ethnicity for DBE status (Department-supplied codes).	Alphanumeric; up to 20 characters.
List of laborers to be used on this contract (detail specified below).	
List of equipment to be used on this contract (detail specified below).	

For example, one such set of information for a company might be:

XYZ CONSTRUCTION, INC.
PRIME CONTRACTOR
1240 9TH STREET
SUITE 600
OAKLAND
CA
94612
JOHN SMITH
(510) 834-9999
XYZ
PAVING
MBE
BLACK

2. The Contractor shall provide the following information for each laborer who will be used on the contract:

Company code (as defined above).	Alphanumeric; up to 10 characters.
Employee ID	Alphanumeric; up to 10 characters.
Last name.	Alphanumeric; up to 20 characters.
First name.	Alphanumeric; up to 15 characters.
Middle initial.	Alphanumeric; up to 1 characters.
Labor classification (Department-provided codes).	Alphanumeric; up to 10 characters.
Hourly rate.	Alphanumeric; up to (6,2)
Trainee status (Y/N).	Alphanumeric; up to 1 characters
Ethnicity (Department-provided codes).	Alphanumeric; up to 20 characters.
Gender.	Alphanumeric; up to 1 characters.

For example, one such set of information might be:

XYZ
1249
GONZALEZ

HECTOR
V
OPR
22.75
N
HISPANIC
M

3. The Contractor shall provide the following information for each piece of equipment that will be used on the contract:

Company code (as defined above).	Alphanumeric; up to 10 characters.
Company's equipment ID number.	Alphanumeric; up to 10 characters.
Company's equipment description.	Alphanumeric; up to 60 characters.
Equipment type (from Department ratebook).	Alphanumeric; up to 60 characters.
Equipment make (from Department ratebook).	Alphanumeric; up to 60 characters.
Equipment model (from Department ratebook).	Alphanumeric; up to 60 characters.
Equipment rate code (from Department ratebook).	Alphanumeric; up to 10 characters
Hourly rate.	Alphanumeric; up to (6,2)
Rental flag.	Alphanumeric; up to 1 character

For example, one such set of information might be:

XYZ
B043
CAT TRACTOR D-6C
TRACC
CAT
D-6C
3645
28.08
N

Data Delivery Requirements.--

1. All data described in "Data Requirements" of this section shall be delivered to the Department electronically, on 3 1/2" floppy disks compatible with the Microsoft Windows operating system. The Contractor shall provide a weekly disk and hard copy of the required correct updated personnel and equipment information for the Contractor and all the subcontractors and verified correct by the Engineer.
2. Data of each type of described in the previous section (Contractor, labor, and equipment information) will be delivered separately, each type in one or more files on floppy disk. Any given file may contain information from one contractor or from multiple contractors, but only one type of data (contractor, labor, or equipment information).
3. The file format for all files delivered to the Department shall be standard comma-delimited, plain text files. This type of file (often called "CSV") is the most standard type for interchange of formatted data; it can be created and read by all desktop spreadsheet and desktop database applications. Characteristics of this type of file are:

   - All data is in the form of plain ASCII characters.
   - Each row of data (company, person, equipment) is delimited by a carriage return character.
   - Within rows, each column (field) of data is delimited by a comma character.

4. The files shall have the following columns (i.e., each row shall have the following fields):

   - Contractor info: 11 columns (fields) as specified in "Data Requirements #1", above.
   - Labor info: 9 columns (fields) as specified in "Data Requirements #2", above.

- Equipment info: 8 columns (fields) as specified in "Data Requirements #3", above.

For each type of file, columns (fields) must be in the order specified under "Data Requirements", above. All columns (fields) described under "Data Requirements" must be present for all rows, even if some column (field) values are empty. The first row of each file may contain column headers (in plain text) rather than data, if desired.

5. Column (field) contents must conform to the data type and length requirements described in the "Data Requirement" section, above. In addition, column (field) data must conform to the following restrictions:

   - All data shall be uppercase.
   - Company type shall be either "PRIME" or "SUB".
   - Labor classification codes must conform to a list of standard codes that will be supplied by Department.
   - Contractor type of work codes and DBE status codes must conform to a list of standard codes that will be supplied by Department.
   - Ethnicity codes must conform to standard codes that will be supplied by Department.
   - Data in the "trainee status" column must be either "Y" or "N".
   - Data in the "gender" column must be either "M" or "F".
   - Data in the "rental equipment" column must be either "Y" or "N".
   - Equipment owner's description may not be omitted. (The description, together with the equipment number, is how the equipment will be identified in the field.)
   - Equipment type, make, model, and ratebook code shall conform to the Department of Transportation Publication entitled "Labor Surcharge and Equipment Rental Rate", which is in effect on the date upon the work is performed. If the equipment in question does not have an entry in the book then alternate, descriptive entries may be made in these fields.

6. The name of each file must indicate its contents, e.g., "XYZlab.txt" for laborers from XYZ Company, Inc. Each floppy disk supplied to the Department must be accompanied by a printed list of the files it contains with a brief description of the contents of each file.

PAYMENT.-- Payment for providing electronic mobile daily diary computer system data delivery will be made on a lump sum basis .The lump sum bid price for electronic mobile daily diary computer system data delivery will be made according to the following schedule:

The Contractor will receive not more than 2.5 per cent per month of the total bid price for electronic mobile daily diary computer system data delivery .

After the completion of the work, 100 per cent payment will be made for electronic mobile daily diary computer system data delivery less the permanent deduction, if any, for failure to deliver complete weekly electronic mobile daily diary computer system data in each month.

The contract lump sum price paid for electronic mobile daily diary computer system data delivery shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in electronic mobile daily diary computer system data delivery as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

In the event the Contractor fails to deliver complete weekly electronic mobile daily diary computer system data in each month , the Department will retain 2.5 per cent of the total bid price for electronic mobile daily diary computer system data delivery until the data is delivered.

10-1.07 OBSTRUCTIONS

Attention is directed to Sections 8-1.10, "Utility and Non-Highway Facilities," and 15, "Existing Highway Facilities," of the Standard Specifications and these special provisions.

The Contractor shall notify the Office of Strong Motion Studies of Mines and Geology at 801 K Street, MS 13-25, Sacramento, CA 95814-3531, telephone number (916) 322-9302, two weeks prior to performing any work that will affect the seismic sensors mounted on the vertical truss members at pier W5 and at mid span between piers W5 and W6.

After notification, the Office of Strong Motion Studies of Mines and Geology will disconnect the sensors and related equipment during the above mentioned two week period and will remount them upon notification by the Contractor through the Engineer when the retrofit work affecting the sensors is completed.

The Contractor shall schedule and complete his retrofit work in the area of the sensors so that the seismic sensors will not be disconnected for more than one week. At least one of the two seismic sensors must remain in operation at all times.

The Contractor's attention is directed to the existence of submarine telephone cables located in the vicinity of Pier W5. The exact location of the submarine cables is not known. Mooring anchors around Pier W5 shall not be allowed. The Contractor shall notify the Engineer in writing prior to performing any work in the vicinity of these submarine telephone cables. The Contractor's attention is also directed to the anchor zones at this location and shown on U.S Coast Guard navigation charts.

The Contractor's attention is directed to the existence of two fiber optic cables on the north side of the lower deck and at the Yerba Buena Island Anchorage as shown on the plans. These cables are owned by Pacific Bell and require temporary relocation at Piers W2, W3, W5 and W6 for the expansion joint retrofit work and at the Anchorage for the installation of the dampers. The Contractor shall notify the Engineer and Pacific Bell 25 days prior to beginning seismic retrofit work at a pier expansion joint or at the Anchorage. Within the first 20 days, Pacific Bell or its contractor will begin temporary relocation of the cables. It will take 5 days to temporarily relocate the cables at each pier expansion joint and at the Anchorage. The Contractor shall notify the Engineer and Pacific Bell 20 days prior to completing seismic retrofit work at a pier expansion joint or at the Anchorage. Pacific Bell or its contractor will take 5 days to place the cables back in their original location. Only one pier expansion joint retrofit shall be allowed at a time. The contact for Pacific Bell is Ross G. Stephenson Associates, Inc., 2801 Coffee Road, Suite B-1, Modesto, CA 95355, telephone number (209) 578-3929.

The following utility facilities will be relocated during the progress of the contract. The Contractor shall notify the Engineer in writing prior to doing any work in the vicinity of the facility. The utility facility will be relocated within the listed working days, as defined in Section 8-1.06, "Time of Completion," of the Standard Specifications, after said notification is received by the Engineer.

Utility	Location	Working Days
Pacific Bell Fiber Optic Cables	Piers W2, W3, W5 and W6	See text
		elsewhere in
		this special
		provision.

In the event that the utility facilities mentioned above are not removed or relocated by the times specified and, if in the opinion of the Engineer, the Contractor's operations are delayed or interfered with by reason of the utility facilities not being removed or relocated by said times, the State will compensate the Contractor for such delays to the extent provided in Section 8-1.09, "Right of Way Delays," of the Standard Specifications, and not otherwise, except as provided in Section 8-1.10, "Utility and Non-Highway Facilities," of the Standard Specifications.

10-1.08 MOBILIZATION

Mobilization shall conform to the provisions in Section 11, "Mobilization," of the Standard Specifications.

10-1.09 MARINE ACCESS TO THE JOBSITE

This work shall consist of furnishing, erecting and removing barges, trestles and other facilities to provide 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.

The Contractor shall submit for approval by the Engineer, a schedule of values detailing the cost breakdown of the contract lump sum item 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: initial mobilization of marine access

facilities 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. Changes in the schedule of values, due to changes by the Contractor in the items and work listed, shall not result in a change in the contract lump sum price for establish marine access.

The schedule of values for establish marine access shall be submitted to the Engineer within the time required for submittal of the Interim Baseline Schedule, as specified in "Progress Schedule (Critical Path)" of these special provisions. The items and work listed in the schedule of values shall be designated in the resource loading required in the Baseline Schedule required in "Progress Schedule (Critical Path)" of these special provisions.

When approved in writing by the Engineer, the schedule of values will be used only 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.

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 establishing marine access to the job site as specified in the Standard Specifications and these special provisions and as directed by the Engineer.

When other contract items are adjusted as provided in Section 4-1.03, "Changes," of the Standard Specifications, the costs of establishing marine access to the job site will be deemed to have been recovered by the Contractor through the payments made for establish marine access, and will be excluded from consideration in determining compensation for the adjustments.

10-1.10 PHOTO SURVEY OF EXISTING BRIDGE

This work shall consist of preparing a photo survey of the existing west span of the San Francisco-Oakland Bay Bridge and other improvements which could be damaged by the Contractor's operations. The Contractor shall prepare the photo survey prior to, during and after performing the seismic retrofit construction activities and as directed by the Engineer.

The Contractor shall submit to the Engineer for approval a complete description of the proposed photo survey locations and subject matter to be taken. The photo survey to be completed shall consist of records of observations, video tapes, and photographs.

Records in triplicate of all observations shall be prepared by the Contractor and every document shall be signed by the authorized representatives of the State and of the Contractor. Video tapes and photographs, as deemed advisable by the Engineer will be made by the Contractor and signed in the manner specified above. One signed copy of every document and photograph will be kept on file by the Engineer.

The above referenced records, video tapes, and photographs are intended for use as indisputable evidence in ascertaining the extent of any damage which may occur as a result of the Contractor's operations. The above-referenced records, video tapes, and photographs are for the protection of the adjacent property owners, the Contractor, and the State. These records will be used to determine any damage from the Contractor's operations during the work.

The contract lump sum price paid for photo survey of existing bridge shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in the photo survey of the existing bridge, as specified in these special provisions, and as directed by the Engineer.

10-1.11 CONSTRUCTION AREA SIGNS

Construction area signs shall be furnished, installed, maintained, and removed when no longer required in accordance with the provisions in Section 12, "Construction Area Traffic Control Devices," of the Standard Specifications and these special provisions.

The Contractor shall notify the appropriate regional notification center for operators of subsurface installations at least 2 working days, but not more than 14 calendar days, prior to commencing any excavation for construction area sign posts. The regional notification centers include but are not limited to the following:

Notification Center	Telephone Number
Underground Service Alert-Northern California (USA)	1-800-642-2444 1-800-227-2600
Underground Service Alert-Southern California (USA)	1-800-422-4133 1-800-227-2600

All excavations required to install construction area signs shall be performed by hand methods without the use of power equipment, except that power equipment may be used if it is determined there are no utility facilities in the area of the proposed post holes.

Sign substrates for stationary mounted construction area signs may be fabricated from fiberglass reinforced plastic as specified under "Prequalified and Tested Signing and Delineation Materials" elsewhere in these special provisions.

Type IV reflective sheeting for sign panels for portable construction area signs shall conform to the requirements specified under "Prequalified and Tested Signing and Delineation Materials" elsewhere in these special provisions.

10-1.12 MAINTAINING TRAFFIC

Attention is directed to Sections 7-1.08, "Public Convenience," 7-1.09, "Public Safety," 12, "Construction Area Traffic Control Devices," of the Standard Specifications and to the Sections entitled "Public Safety" and "Cooperation" elsewhere in these special provisions, and these special provisions. Nothing in these special provisions shall be construed as relieving the Contractor from the responsibilities specified in Section 7-1.09.

The minimum size specified for Type II flashing arrow signs in the table following the second paragraph of Section 12-3.03, "Flashing Arrow Signs," of the Standard Specifications is amended to read "36 inches by 72 inches".

In the Standard Plans, Note 10 on Standard Plan T10, Note 9 on Standard Plan T10A, Note 5 on Standard Plan T11, Note 6 on Standard Plan T12, Note 5 on Standard Plan T13, and Note 4 on Standard Plan T14 are revised to read:

All traffic cones used for night lane closures shall have reflective cone sleeves as specified in the specifications.

The second and third paragraphs of Section 12-3.10, "Traffic Cones," of the Standard Specifications are amended to read:

During the hours of darkness traffic cones shall be affixed with reflective cone sleeves. The reflective sheeting of sleeves on the traffic cones shall be visible at 1,000 feet at night under illumination of legal high beam headlights, by persons with vision of or corrected to 20/20.

Reflective cone sleeves shall conform to the following:

1. Removable flexible reflective cone sleeves shall be fabricated from the reflective sheeting specified in the special provisions, have a minimum height of 13 inches and shall be placed a maximum of 3 inches from the top of the cone. The sleeves shall not be in place during daylight hours.
2. Permanently affixed semitransparent reflective cone sleeves shall be fabricated from the semitransparent reflective sheeting specified in the special provisions, have a minimum height of 13 inches, and shall be placed a maximum of 3 inches from the top of the cone. Traffic cones with semitransparent reflective cone sleeves may be used during daylight hours.
3. Permanently affixed double band reflective cone sleeves shall have 2 white reflective bands. The top band shall be 6 inches in height, placed a maximum of 4 inches from the top of the cone. The lower band shall be 4 inches in height, placed 2 inches below the bottom of the top band. Traffic cones with double band reflective cone sleeves may be used during daylight hours.

The type of reflective cone sleeve used shall be at the option of the Contractor. Only one type of reflective cone sleeve shall be used on the project.

The C16 and C17 designations of the signs shown on the detail "Entrance Ramp Without Turning Pockets" of Standard Plan T14 are amended to designate the signs as R16 and R17, respectively.

Lane closures shall conform to the provisions in the section of these special provisions entitled "Traffic Control System for Lane Closure."

NOTIFICATION OF ALTERED HORIZONTAL AND VERTICAL CLEARANCES

The Contractor shall provide the Engineer with a 21 day written notice prior to making any temporary or permanent changes at the work site that will affect existing horizontal and vertical clearances on any highway, freeway, ramp, connector, city street, utility or railroad facility. The notice shall be in sufficient detail to show existing and proposed measurements of the alteration and the location where the measurements were taken. Within 24 hours after a change, the Contractor shall provide the Engineer with a written notice indicating the actual horizontal and vertical clearances as changed. The above notification requirements includes the removal of any temporary conditions or restrictions affecting horizontal and vertical clearances.

Temporary changes having an effect on horizontal and vertical clearances include, but are not limited to: installation of false-work, temporary bridges and pedestrian walkways; placement of temporary detours with vertical grade changes and structures, concrete barriers (temporary railing (type K), including glare screen if applicable) encroaching on a lane, shoulder, ramp or connector widths; lane shifts or widening; detours, and closure or realignment of ramps.

Permanent clearance alterations include, but are not limited to, pavement overlays under structures, erection of new sign structures or modifications to existing sign structures, seismic retrofit modifications over the traveled way, and construction of new structures.

This requirement is separate and in addition to the requirements of the “Closure Requirements and Conditions” section included in these special provisions. Failure to comply with these requirements will result in disapproved closures and no compensation will be allowed therefore.

Compensation for compliance with notification requirements

Full compensation for conforming to the requirements of this section and its notification requirements is included in the contract prices paid for the various items of work involved and no additional compensation will be allowed therefor.

CLOSURE REQUIREMENTS AND CONDITIONS

General. The Engineer reserves the authority to disapprove any closure schedule request, deny or abort any closure on any portion of the traveled way or shoulder of a highway, freeway, ramp, connector, city street, utility or railroad facility when deemed necessary for the safe and efficient operation of public traffic or when necessary to resolve conflicts in closure schedules' among Contractors or other forces performing work within the State right of way.

A lane closure, as used in this section, is defined as the closure of any lane or lanes, ramp or connector, city street or any combination thereof within a single temporary traffic control system.

The Contractor shall not pursue contract work requiring a closure on any portion of the traveled way or shoulder of a highway, freeway, ramp, connector, city street , utility or railroad facility outside the time limits specified in "Maintaining Traffic" of these special provisions.

Lane Closure Schedules. On or before each Monday at noon, the Contractor shall furnish to the Engineer a written schedule of all closures for the week period beginning the following Saturday and ending on the following Friday. This schedule shall identify in advance all planned closures required in the performance of contract work.

The written schedule shall show the locations and times when the proposed closures are to be in effect. The Contractor will be provided with copies of "Closure Request Form" (Form 4CD-170) for this purpose. Proposed closures not conforming to the time limits specified elsewhere in these Special Provisions or submitted with incomplete, unintelligible or inaccurate information will be returned for correction. The Contractor will be notified promptly of any disapproved closures, or any closure that will require coordination with other parties as a condition of approval. The Contractor will also be notified whenever California Highway Patrol (CHP) assistance is scheduled in conjunction with the approved lane closure schedules.

Contingency Plans. The Contractor shall provide the Engineer a practicable contingency plan for reopening all closed lanes to public traffic in the event of an equipment breakdown, shortage of or lack of production of materials or any other production failure or when it becomes necessary to provide the lanes, ramps, or connectors for use by public traffic. If the nature of the operations in progress makes the reopening of the traffic lanes impractical, then the Contractor shall provide a plan for the management of public traffic until reopening can be accomplished. The Contractor shall submit a contingency plan to the Engineer a minimum of 5 days in advance of the related lane closures. The contingency plan shall be approved in writing by the Engineer prior to the Contractor implementing the scheduled lane closures

Acceptance of the contingency plan by the Engineer shall not relieve the Contractor from the requirement of opening the lane or lanes to public traffic as specified in “Traffic Control System for Lane Closure” of these special provisions. Full compensation for providing the contingency plan and implementing the plan shall be considered as included in the various items of work.

Additions and Cancellations. Requests for additional lane closures submitted three or more business days in advance of the intended closures and not included in the Lane Closure Schedule will be approved only if they do not conflict with any requested closure. Requests made within three business days will not be approved.

The Contractor shall confirm all scheduled closures at least 3 business days prior to the date on which the closure of traffic lanes is to be made. A business day is defined as Monday through Friday excluding designated holidays and excluding the following days: third Monday in January, February 12th, second Monday in October, and November 11th.

All scheduled lane closures not confirmed as scheduled shall be considered cancelled. If the confirmation or approval day falls on a non-business day, the confirmation or approval will occur on the preceding business day.

The written notice to the Engineer of changes or cancellations to any lane closure shall be made between the hours of 7:00 a.m. and 3:00 p.m., Monday through Friday, excluding designated holidays.

All confirmed closures that are cancelled for inclement weather will be rescheduled by the Contractor and submitted to the Engineer for approval.

Late Reopening of Closed Lanes If a lane closure is not reopened to public traffic by the specified time, then all work shall be suspended in accordance with Section 8-1.05 of the Standard Specifications, "Temporary Suspension of the Work." The Contractor shall not be allowed to make any further freeway closures until the Engineer has accepted a Work Plan, submitted by the Contractor, that will insure that future closures will be reopened to public traffic at the specified time. The Engineer shall have 2 working days to accept or reject the Contractor's proposed Work Plan.

Should the Contractor fail to provide all freeway lanes ready for use by the public traffic at the times specified in the "Lane requirements and Hours of Work Charts" for Lane Closure Charts included in "Maintaining Traffic," of these special provisions, damages will be assessed. For each 10 minute period, or fraction thereof, that all freeway lanes are not available for use by public traffic, damages will amount to $7,700 up to a maximum of $139,000 per day, and the Department will deduct such amount from any moneys due, or that may become due, from the Contractor. These damages will not be assessed on the lane closures for City streets. The damages for clearing lane closures on City street later than scheduled will be assessed as per the Contractor's construction permit and agreement with the City. It is expressly agreed by the parties that these specific damages to public traffic are uncertain and cannot be ascertained with any degree of accuracy and that, therefore, they are liquidated damages established at the time of entering the contract.

These liquidated damages herein provided for are in addition to those specified in "Beginning of Work, Time of Completion and Liquidated Damages" and "Traffic Control System for Lane Closure" elsewhere in these special provisions.

When the Contractor providing the traffic control is delayed by other Contractors' work in clearing the lane closure, no lane closure damages will be assessed to the Contractor providing traffic control. Additional compensation will be provided to the Contractor providing traffic control for delay in clearing the lane closure due to other Contractors' work. This additional work will be paid for as extra work as provided in Section 4-1.03D of the Standard Specifications. .

DENIAL OF PREVIOUSLY REQUESTED OR APPROVED LANE CLOSURES

Denied Closures. If the Contractor is denied a requested lane closure included in a Lane Closure Schedule or is directed by the Engineer to not use or install a previously approved closure because it becomes necessary to provide the lanes, shoulders, ramps, or connectors for use by public traffic due to congested conditions or for any other reason, except weather, beyond, the control of the Contractor, as determined by the Engineer, and if the Contractor sustains a loss which could not have been avoided by rescheduling the affected closure, or by judicious handling of forces, equipment and plant, compensation will be determined as provided herein. No compensation for lane closures requested as additional lane closures that were not included in a Lane Closure Schedule, if denied because of conflicts with other scheduled closures will be made.

Terminated Closures. If an approved closure is in place within the approved closure times and it becomes necessary to provide the lanes, shoulders, ramps, or connectors for use by public traffic due to congested conditions or for any reason, except weather, beyond the control of the Contractor, as determined by the Engineer, the Contractor will be compensated for the cost of implementing the contingency plan, furnishing, placing and removal of any temporary materials as provided herein.

The Contractor will be granted an extension of contract time commensurate with the delay in accordance with the provisions of Section 8-1.07, "Liquidated Damages," of the Standard Specifications and the "Progress Schedule (Critical Path)" section of these special provisions.

The Contractor will be compensated for the idle time of forces and equipment in accordance with the provisions of Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

Personal vehicles of the Contractor's employees shall not be parked within the right of way.

All closures shall comply with the following requirements, and as shown on the plans:

The Contractor shall notify local authorities of the Contractor's intent to close any City street at least 7 days prior to each closures. The Contractor shall cooperate with local authorities relative to handling traffic through the area and shall make all arrangements relative to keeping the working area clear of parked vehicles. The Contractor shall contact the City and County of San Francisco, Department of Traffic Engineering Division at (415) 554-2331 and the Chief Harbor Engineer of the Port of San Francisco at (415) 274-0541.

Whenever vehicles or equipment are parked on the shoulder within 6 feet of a traffic lane, the shoulder area shall be closed as shown on the plans.

Route 80 lanes and ramps shall be closed only during the hours shown on the charts included in this section "Maintaining Traffic." Except work required under Sections 7-1.08, “Public Convenience,” and 7-1.09, “Public Safety,” of the Standard Specifications, work that interferes with public traffic shall be performed only during the hours shown for lane closures. Simultaneous ramp closures are not permitted unless a ramp closure chart specifically permits such simultaneous closures.

A maximum of 30 complete closures (in accordance with lane closure chart no. 3) for the westbound direction of the San Francisco-Oakland Bay Bridge will be allowed only for erecting structural steel above the roadway. Complete closures shall be required for erecting structural steel for all center gusset plates, side diagonal plates, side gusset plates, and top and bottom diagonal plates, at or above the lower center gusset plates at the tower above the roadway. Complete closures will not be allowed for any other work." During the complete closures, the Contractor must allow for the passage of emergency vehicles. All such vehicles will be escorted by the California Highway Patrol.

The Contractor will be allowed a maximum of 45 partial closures of the Embarcadero between Bryant Street and Harrison Street from 12 midnight to 5:00 a.m. for seismic retrofitting of the San Francisco-Oakland Bay Bridge overhead. These closure can be in either the northbound or southbound direction of the Embarcadero. Detours shall be as shown on the plans. The Embarcadero shall not be closed during special events. The Contractor may obtain a list of special events from the San Francisco Department of Parking and Traffic Control, 25 Van Ness Avenue, Suite 345, telephone number (415) 554-2341. It is the Contractor's responsibility to periodically check with the department for revision and additions to the list. Special events shall include but not limited to the Giants and 49er games. During these partial closures, the Contractor must allow for the passage of emergency vehicles.

The closure of the Embarcadero between Bryant Street and Harrison Street shall not affect the Municipal Railway Light Rail operations at any time. The Contractor shall provide flaggers as required to assist the passage of the Light Rail and emergency vehicles during the Embarcadero closure to vehicular traffic. During the closure of the Embarcadero, detour lanes, as shown on the plans, shall be of adequate width to allow passage of coach lines. A turning radius of 45 feet shall be provided for coach lines. The Contractor shall notify the Chief Transit Control Inspector of the Municipal Railway at (415) 554-9286, through the Engineer, at least 10 days in advance of any work in the vicinity of passenger loading or unloading zones. The Municipal Railway during these times, will at no cost to the Contractor, provide temporary loading or unloading zones away from the construction work.

Attention is directed to Section 13, "Railroad Relations And Insurance" elsewhere in these special provisions.

Advance information signs (with dates and time of closure) informing public traffic of future ramp closures shall be installed as shown on the plans, a minimum of 7 days in advance of the intended ramp closure.

Advance information signs (with dates and time of closure) informing public traffic of future complete closures of the westbound direction of the San Francisco-Oakland Bay Bridge shall be installed as shown on the plans, a minimum of 15 days in advance of the intended bridge complete closure.

Designated holidays for the purpose of determining allowable lane closure hours are: January 1st, the third Monday in February, the last Monday in May, July 4th, the first Monday in September, Thanksgiving Day, the day after Thanksgiving day, and December 25th. When a designated holiday falls on a Sunday, the following Monday shall be a designated holiday.

Minor deviations from the requirements of this section concerning hours of work which do not significantly change the cost of the work may be permitted upon the written request of the Contractor if in the opinion of the Engineer, public traffic will be better served and the work expedited. These deviations shall not be adopted by the Contractor until the Engineer has approved them in writing. All other modifications will be made by contract change order.

Pursuant to Standard Specifications Section 7-1.09 "Public Safety" and Section 7-1.12 "Responsibility for damage" the Contractor assumes all liability for accidents in or resulting from the lane closures, including but not limited to property damage, injuries or death to all workers performing work within the Contractor's traffic control system.

In addition to the signs shown on the plans, the following described signs shall be furnished and placed when bridge cleaning and painting occur:

1. A portable 30" x 30" C23 "Road Work Ahead" sign shall be furnished and placed at all locations where traffic approaches a bridge that has work under way. The signs shall conform to the provisions in Section 12-3.06, "Construction Area Signs," of the Standard Specifications. An orange, fluorescent orange, or red flag, not less than 16 inches square, shall be attached to each sign. The exact location of the signs will be determined by the Engineer. The signs shall be maintained in place when cleaning and painting operations are being performed and shall be removed at the end of each day's work.

2. Separate individual signs, each approximately 4 feet square with the words "CLEANING AND PAINTING OPERATIONS" in black letters approximately 4 inches high and the Contractor's name, address and telephone number, all on an orange background, shall be furnished and placed. The signs shall be in place at all times when cleaning and painting operations are under way and shall be placed near each of the "Road Work Ahead" signs.

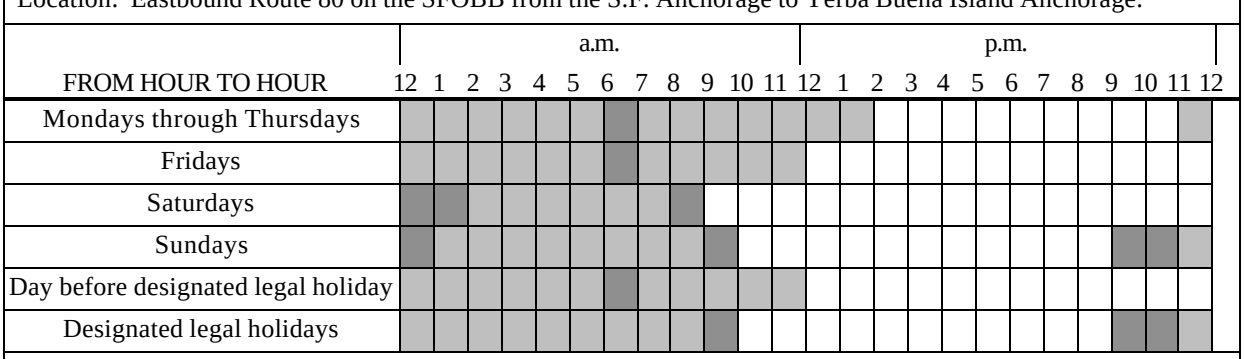
Full compensation for furnishing, placing, maintaining, and removing the signs as specified in the preceding paragraph shall be considered as included in the prices paid for the various contract items of work and no separate payment will be made therefor.

When bridge cleaning and painting, the Contractor's attention is directed to "Railroad Relations and Insurance" of these special provisions regarding occupancy of the railroad right of way.

Supply lines for bridge cleaning and painting may be laid along the top of curbs adjacent to railing posts, provided they do not interfere with public traffic. These lines shall be removed when work is not in progress.

Chart No. 1
Multilane Lane Requirements

Location: Eastbound Route 80 on the SFOBB from the S.F. Anchorage to Yerba Buena Island Anchorage.



Legend:

- Provide at least two adjacent traffic lanes.
- Provide at least three adjacent traffic lanes.
- Provide at least four adjacent traffic lanes.
- Provide at least four adjacent traffic lanes. (See Remarks)
- No lane closure permitted

REMARKS: Weekday daytime lane closure subject to the following: May not be installed between 7:00 AM and 9:00 AM (if the closure is not already in place by 7:00 AM, installation of closure CAN NOT begin until after 9:00 AM).

Chart No. 2
Multilane Lane Requirements

Location: Westbound Route 80 on the SFOBB from west of the San Francisco-Oakland Bay Bridge Toll Plaza.

	a.m.												p.m.												
FROM HOUR TO HOUR	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Mondays through Thursdays																									
Fridays																									
Saturdays																									
Sundays																									
Day before designated legal holiday																									
Designated legal holidays																									

Legend:

- Provide at least one traffic lane.
- Provide at least two adjacent traffic lanes.
- Provide at least three adjacent traffic lanes.
- Provide at least four adjacent traffic lanes.
- Provide at least four adjacent traffic lanes. (See Remarks)
- No lane closure permitted

REMARKS: Weekday daytime lane closure subject to the following:

1) May not be placed while traffic is still being metered onto the bridge.
2) May not be placed until traffic flow rate (volume) decreases below 6,600 vph as determined by the Bay Bridge Traffic Management Center.

Note: These traffic conditions are typically NOT met on better than 50% of typical weekdays.

Chart No. 3
Multilane Lane Requirements

Location: Westbound Route 80 on the SFOBB from west of the Route 80/580/880 Distribution Structure.

	a.m.												p.m.												
FROM HOUR TO HOUR	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Mondays through Thursdays																									
Fridays																									
Saturdays																									
Sundays		■	■	■	■																				
Day before designated legal holiday																									
Designated legal holidays																									

Legend:

■ All bridge lanes may be closed.

□ No bridge closure permitted

REMARKS: Closure shall be implemented at the Distribution Structure. WB Route 80 shall be closed at the Berkeley Curve. WB Route 580 to WB Route 80 connector shall be closed. NB Route 880 to WB Route 80 connector shall be closed. West Grand Avenue access to the SFOBB shall be closed.

Chart No. 4
Ramp Lane Requirements

Location: Eastbound Route 80. On the Essex St. On-Ramp or First Street On-Ramp.

	a.m.												p.m.												
FROM HOUR TO HOUR	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Mondays through Thursdays	■	■	■	■	■	■	■																	■	
Fridays	■	■	■	■	■	■	■																		
Saturdays		■	■	■	■	■	■	■	■	■															
Sundays		■	■	■	■	■	■	■	■	■	■													■	
Day before designated legal holiday	■	■	■	■	■	■	■																		
Designated legal holidays		■	■	■	■	■	■	■	■	■	■													■	

Legend:

■ Ramp may be completely closed and traffic detoured.

□ No ramp closure permitted.

REMARKS: See detour in plans.

Chart No. 5
Ramp Lane Requirements

Location: Eastbound Route 80. On the Sterling St. On-Ramp.

	a.m.												p.m.												
FROM HOUR TO HOUR	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Mondays through Thursdays	■	■	■	■	■	■	■														■	■	■	■	
Fridays	■	■	■	■	■	■	■															■	■	■	
Saturdays	■	■	■	■	■	■	■	■	■	■	■	■	■	■								■	■	■	
Sundays	■	■	■	■	■	■	■	■	■	■	■	■	■	■							■	■	■	■	
Day before designated legal holiday	■	■	■	■	■	■	■															■	■	■	
Designated legal holidays	■	■	■	■	■	■	■	■	■	■	■	■	■	■							■	■	■	■	

Legend:

■ Ramp may be completely closed and traffic detoured.

□ No ramp closure permitted.

REMARKS: See detour in plans.

Chart No. 6
Ramp Lane Requirements

Location: Eastbound Route 80. Simultaneous closure of both the Essex St On-Ramp and the First St On-Ramp.

	a.m.												p.m.												
FROM HOUR TO HOUR	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Mondays through Thursdays	■	■	■	■	■	■																			
Fridays	■	■	■	■	■	■																			
Saturdays				■	■	■	■	■																	
Sundays				■	■	■	■	■	■																
Day before designated legal holiday	■	■	■	■	■	■																			
Designated legal holidays				■	■	■	■	■	■																

Legend:

■ Ramps may be completely closed and traffic detoured.

□ No ramp closure permitted.

REMARKS: See detour in plans.

10-1.13 TRAFFIC CONTROL SYSTEM FOR LANE CLOSURE

Attention is directed to Sections 7-1.08, "Public Convenience," 7-1.09, "Public Safety," and 12, "Construction Area Traffic Control Devices," of the Standard Specifications and to the Sections entitled "Public Safety" and "Cooperation" elsewhere in these special provisions, and these special provisions.

The provisions in this section will not relieve the Contractor from the responsibility to provide such additional devices or take such measures as may be necessary to comply with the provisions in Section 7-1.09, "Public Safety," of the Standard Specifications.

A traffic control system shall consist of closing traffic lanes and ramps in accordance with the details shown on the plans, the provisions of Section 12, "Construction Area Traffic Control Devices," of the Standard Specifications, the provisions under "Maintaining Traffic" and "Construction Area Signs" elsewhere in these special provisions.

The Contractor shall provide all traffic control required for this project. Work required for all other contracts within the contract work limits of this contract shall be permitted where such work will not impact the Contractor's operations unless directed by the Engineer. All lane closures unless approved by the Engineer shall be assumed to be for the full length of the SFOBB between the Toll Plaza in the City of Oakland and the First Street on-ramps in the City of San Francisco. Maintenance work by State forces shall be permitted where such work will not impact the Contractor's operations or when emergency work by State forces is required. The Contractor shall coordinate his operations with maintenance forces performing work. State forces may install their own lane closures if needed when contractor is not scheduled to install a lane closure.

The Contractor shall be required to provide additional lane closures for the exclusive use of other contractors or State forces as requested by the Engineers. The estimated number and type of closures is as follows:

"Lower deck, single lane closure day and night (LDS)" **200**
"Upper deck, single lane closure day and night (UDS)" **5**
"Lower deck multilane lane closure night (LDMN)" **15**
"Upper deck multilane lane closure night (UDMN)" **20**

The Contractor shall be responsible for all costs incurred to other contracts and State forces in the event that lane closures are not provided as per the approved closure schedule.

All access to the work from either the upper or lower deck of the bridge, which may be contemplated by the Contractor, will be subject to coordination with other contracts, which may be in progress during this contract. The determination of which of the lanes will be closed for access to the work will be made in accordance with these special provisions, subsections "Closure Scheduling and Notification", "Work" and "Contingency Plan".

In the eastbound direction of Route 80, the start of all daytime closures shall be at the San Francisco Anchorage of the San Francisco-Oakland Bay Bridge, as shown on the plans. In the westbound direction, the start of all daytime closures shall be prior to the incline section at the Oakland end of the bridge where a shoulder exists for the placement of a flashing arrow sign. Night closures on the bridge are not subject to the above requirements.

At most locations on the bridge, there are no shoulders. At these locations, the initial flashing arrow sign shall be placed as close to the beginning of the taper as possible. A minimum of 1500 feet of sight distance shall be provided where possible for vehicles approaching the initial flashing arrow sign. In addition, prior to the first taper, additional cones shall be placed along the curb and spaced at no more than 50 feet for a minimum distance of 500 feet. All advance warning signs shall be installed at appropriate distances in accordance with the plans.

A portable changeable message sign shall be placed at locations shown on the plans and as directed by the Engineer. The signs shall be in place and in operation 14 days prior to the complete closure of the westbound direction of the San Francisco-Oakland Bay Bridge. Portable changeable message signs shall conform to the provisions in “Portable Changeable Message Signs,” elsewhere in these special provisions.

At various San Francisco city street intersections, there shall be stationed a uniformed San Francisco Department of Parking and Traffic, Parking Control Officers for the closure of the Embarcadero between Bryant Street and Harrison Street. The exact locations and requirements for the Parking Control Officers shall conform to the provisions in "Traffic Control Utilizing Special Forces," elsewhere in these special provisions.

Each vehicle used to place, maintain and remove components of a traffic control system on multilane highways shall be equipped with a Type II flashing arrow sign which shall be in operation when the vehicle is being used for placing, maintaining, or removing the components. Vehicles equipped with Type II flashing arrow sign not involved in placing, maintaining, or removing the components when operated within a stationary type lane closure shall only display the caution display mode. The sign shall be controllable by the operator of the vehicle while the vehicle is in motion. The flashing arrow sign shown on the plans shall not be used on the vehicles which are doing the placing, maintaining, and removing, of components of a traffic control system, and shall be in place before a lane closure requiring its use is completed.

If any component in the traffic control system is displaced, or ceases to operate or function as specified, from any cause, during the progress of the work, the Contractor shall immediately repair the component to its original condition or replace the component and shall restore the component to its original location.

When lane and ramp closures are made for work periods only, at the end of each work period, all components of the traffic control system, except portable delineators placed along open trenches or excavation adjacent to the traveled way, shall be removed from the traveled way and shoulder. If the Contractor so elects, the components may be stored at selected central locations, approved by the Engineer, within the limits of the highway right of way.

The contract lump sum price paid for traffic control system shall include full compensation for furnishing all labor, materials (including signs), tools, equipment and incidentals, and for doing all the work involved in placing, removing, storing, maintaining, moving to new locations, replacing and disposing of the components of the traffic control system as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

The item price paid for providing lane closures for other contractors or State forces as requested by the Engineer shall include full compensation for furnishing all labor, materials (including signs), tools, equipment and incidentals, and for doing all the work involved in placing, removing, storing, maintaining, moving to new locations, replacing and disposing of the components of the traffic control system as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

The adjustment provisions in Section 4-1.03, "Changes," of the Standard Specifications, shall not apply to the items of traffic control system. Adjustments in compensation for traffic control system will be made only for increased or decreased traffic control system required by changes ordered by the Engineer and will be made on the basis of the cost of the increased or decreased traffic control necessary. Such adjustment will be made on a force account basis as provided in Section 9-1.03, "Force Account Payment," of the Standard Specifications for increased work, and estimated on the same basis in the case of decreased work.

Traffic control system required by work which is classed as extra work, will be paid for as extra work as provided in Section 4-1.03D of the Standard Specifications.

10-1.14 TRAFFIC CONTROL UTILIZING SPECIAL FORCES

The seismic retrofitting of the San Francisco-Oakland Bay Bridge will require the closing of The Embarcadero between Bryant Street and Harrison Street and create a need for traffic control utilizing special forces. These special forces shall be San Francisco Department of Parking and Traffic, Parking Control Officers. The number and location of these officers shall be as follows:

The Embarcadero and Bryant Street (2 for northbound closure, 1 for southbound closure)
Bryant and Main Streets (1 for northbound closure, 2 for southbound closure)
Main and Harrison Streets (1 for northbound closure, 2 for southbound closure)
Harrison Street and The Embarcadero (2 for northbound closure, 1 for southbound closure)

Traffic control utilizing special forces shall be performed in accordance with the provisions in Section 9-1.03B, "Work Performed by Special Forces or Other Special Services," of the Standard Specifications and these special provisions.

Additional officers shall be provided, as directed by the Engineer, to ensure the efficient flow of traffic at these locations.

The officers shall perform the duties of:

1. Directing vehicular traffic.
2. Directing pedestrian traffic.
3. Citing motorists for double parking and having illegally parked vehicles towed away.
4. Other traffic control duties as required.

The officers will be paid a minimum of four hours. The officers will be paid for each additional hour worked plus travel time. For a twelve hour shift, the officers shall be paid for thirteen hours.

The Contractor shall contact the San Francisco Department of Parking and Traffic at telephone number (415) 554-2331 for any additional information. The Contractor shall enter into an agreement with the San Francisco Department of Parking and Traffic to provide officers within 30 calendar days of the start of work. The Contractor shall make a deposit of $2000 or the amount necessary to provide officers for a period of two weeks, whichever is greater to the San Francisco Department of Parking and Traffic. The Contractor shall pay the San Francisco Department of Parking and Traffic the amount of each invoice within 30 calendar days of the date of the invoice.

The Contractor shall notify of the San Francisco Department of Parking and Traffic of the schedule and number of officers required at least 4 calendar days in advance of the scheduled date. The minimum time allowed to cancel scheduled officers is 24 hours prior to the scheduled date.

Traffic control utilizing special forces will be paid for as extra work as provided in Section 4-1.03D, "Extra Work," of the Standard Specifications.

10-1.15 BARRIER TRUCK

This work shall consist of furnishing, placing, operating, maintaining, and removing barrier trucks as specified in these special provisions and as directed by the Engineer.

The Contractor shall provide a barrier truck to protect the equipment and personnel, operating the equipment, in the closed lane.

Barrier trucks shall weigh between 11,000 and 18,000 pounds and shall be equipped with a truck-mounted crash cushion (TMCC).

Truck-mounted crash cushions (TMCC) shall meet the requirements as specified in these special provisions.

The Contractor shall park one barrier truck between 30 feet and 50 feet in advance of the equipment being operated in the closed lane unless otherwise directed by the Engineer. The barrier truck shall be equipped with a manual transmission, the transmission set in second gear, the emergency brakes engaged, and the ignition off. The barrier truck shall be unoccupied and positioned so that it will shield the equipment and personnel and will intercept errant vehicles. The barrier truck shall be parked on clean pavement with the front of the truck pointed away from traffic to prevent secondary collisions if the barrier truck is hit and pushed ahead. The front wheels shall be turned away from the lanes open to the traffic.

Barrier trucks, when no longer required for the work, as determined by the Engineer, shall become the property of the Contractor.

Full compensation for furnishing, placing , operating, maintaining, and removing barrier trucks shall be considered as included in the contract lump sum price paid for traffic control system and no additional compensation will be allowed therefor.

Truck-mounted crash cushions (TMCC) for use in moving lane closures shall be any of the following approved models, or equal:

(1) Hexofoam TMA Series 3000 and Alpha 1000 TMA Series 1000 and Alpha 2001 TMA Series 2001		
Manufacturer:	Distributor(Northern):	Distributor(Southern):
Energy Absorption Systems, Inc.	Traffic Control Service, Inc.	Traffic Control Service, Inc.
One East Wacker Drive	8585 Thys Court	1881 Betmor Lane
Chicago, IL 60601-2076	Sacramento, CA 95828	Anaheim, CA 92805
Telephone (312) 467-6750	Telephone (800) 884-8274	Telephone (800) 222-8274
	FAX (916) 387-9734	

(2) Cal T-001 Model 2 or Model 3	
Manufacturer:	Distributor:
Hexcel Corporation	Hexcel Corporation
11711 Dublin Blvd.	11711 Dublin Blvd.
P.O. Box 2312	P.O. Box 2312
Dublin, CA 94568	Dublin, CA 94568
Telephone (510) 828-4200	Telephone (510) 828-4200

(3) Renco Rengard Model Nos. CAM 8-815 and RAM 8-815	
Manufacturer:	Distributor:
Renco Inc.	Renco Inc.
1582 Pflugerville Loop Road	1582 Pflugerville Loop Road
P.O. Box 730	P.O. Box 730
Pflugerville, TX 78660-0730	Pflugerville, TX 78660-0730

Telephone (800) 654-8182	Telephone (800) 654-8182

Each TMCC shall be individually identified with the manufacturer's name, address, TMCC model number, and a specific serial number. The names and numbers shall each be a minimum 1/2 inch high, and located on the left (street) side at the lower front cover. The TMCC shall have a message next to the name and model number in 1/2 inch high letters which states, "The bottom of this TMCC shall be _____ inches ±_____ inches above the ground at all points for proper impact performance." Any TMCC which is damaged or appears to be in poor condition shall not be used unless recertified by the manufacturer. The Engineer shall be the sole judge as to whether used TMCCs supplied under this contract need recertification. Each unit shall be certified by the manufacturer to meet the requirements for TMCCs in accordance with the standards established by the Transportation Laboratory Structures Research Section.

Approvals for new TMCC designs proposed as equal to the above approved models shall be in accordance with the procedures (Including crash testing) established by the Transportation laboratory Structures Research Section. For information regarding submittal of new designs for evaluation contact:

Transportation Laboratory
Structures Research Section
P.O. Box 19128
5900 Folsom Boulevard
Sacramento, CA 95819

New TMCCs proposed as equal to approved TMCCs or approved TMCCs determined by the Engineer to need recertification shall no be used until approved or recertified by the Transportation Laboratory Structures Research Section.

10-1.16 BARRICADES

Barricades shall be furnished, placed, and maintained at the locations designated by the Engineer, shown on the plans, or specified and shall conform to the provisions in Section 12, "Construction Area Traffic Control Devices," of the Standard Specifications and these special provisions.

Type II reflective sheeting for stripes on barricade rail faces shall conform to the requirements specified under "Prequalified and Tested Signing and Delineation Materials," elsewhere in these special provisions.

Barricades shown on the plans as part of a traffic control system will be paid for as provided in "Traffic Control System for Lane Closure," elsewhere in these special provisions, and will not be included in counts for payment for barricades.

10-1.17 PORTABLE CHANGEABLE MESSAGE SIGN

Portable changeable message signs shall be furnished, placed, operated, and maintained at locations shown on the plans and shall conform to the provisions of Section 12, "Construction Area Traffic Control Devices," of the Standard Specifications.

10-1.18 TEMPORARY RAILING

Temporary railing (Type K) shall be placed at the locations shown on the plans, specified in these special provisions or in the Standard Specifications or ordered by the Engineer, and shall conform to the provisions in Section 12, "Construction Area Traffic Control Devices," of the Standard Specifications and these special provisions.

The fourth paragraph of Section 12-4.01, "Measurement and Payment," of the Standard Specifications is amended to read:

> When the Engineer's Estimate includes a contract item for temporary railing (Type K), the temporary railing (Type K) will be measured by the linear foot along the top of the railing, at each location shown on the plans, specified, or ordered by the Engineer. If the Engineer orders a lateral move of the temporary railing (Type K), and the repositioning is not shown on the plans, moving the temporary railing will be paid for as extra work as provided in Section 4-1.03D and the temporary railing will not be measured in the new position. Temporary railing (Type K) placed in excess of the length shown, specified, or ordered will not be paid for. The contract price paid per linear foot for temporary railing (Type K) shall include full compensation for furnishing all labor, materials (including reinforcement and Type P marker panels), tools, equipment and incidentals, and for doing all the work involved in furnishing, placing, maintaining, repairing, replacing, and removing the temporary railing, including excavation and backfill, drilling holes and bonding threaded rods or dowels when required, removing threaded rods or dowels and filling the drilled holes with mortar, furnishing and installing reflectors, and moving and replacing removable panels as required, complete in place, as shown on the plans, as specified in these specifications and the special provisions, and as directed by the Engineer.

Reflectors on temporary railing (Type K) shall conform to the provisions in "Prequalified and Tested Signing and Delineation Materials," of these special provisions.

Temporary railing (Type K), conforming to the details shown on 1995 Standard Plan T3 or 1997 Standard Plan T3, may be used. Temporary railing (Type K) fabricated prior to January 1, 1993, and conforming to 1988 Standard Plan B11-30 may be used, provided the fabrication date is printed on the required Certificate of Compliance.

The Contractor's attention is directed to the provisions in "Public Safety" and "Order of Work" elsewhere in these special provisions.

Temporary railing (Type K) placed in accordance with the provisions in "Public Safety" elsewhere in these special provisions will not be measured nor paid for.

10-1.19 CHANNELIZERS

Channelizers shall be surface mounted type and shall be furnished, placed and maintained at the locations shown on the plans and shall conform to the provisions in Sections 12, "Construction Area Traffic Control Devices," of the Standard Specifications and these special provisions.

Channelizers shall conform to the provisions in "Prequalified and Tested Signing and Delineation Materials," elsewhere in these special provisions.

Channelizer posts shall be orange in color.

10-1.20 TEMPORARY CRASH CUSHION MODULE

This work shall consist of furnishing, installing and maintaining sand filled temporary crash cushion modules in groupings or arrays at each location shown on the plans, specified in the special provisions or directed by the Engineer. The grouping or array of sand filled modules shall form a complete sand filled temporary crash cushion in accordance with the details shown on the plans and these special provisions.

Attention is directed to "Public Safety" of these special provisions.

GENERAL

Whenever the work or the Contractor's operations establishes a fixed obstacle, the exposed fixed obstacle shall be protected with a sand filled temporary crash cushion. The sand filled temporary crash cushion shall be in place prior to opening the lanes adjacent to the fixed obstacle to public traffic.

Sand filled temporary crash cushions shall be maintained in place at each location, including times when work is not actively in progress. Sand filled temporary crash cushions may be removed during a work period for access to the work provided that the exposed fixed obstacle is 15 feet or more from a lane carrying public traffic and the temporary crash cushion is reset to protect the obstacle prior to the end of the work period in which the fixed obstacle was exposed. When no longer required, as determined by the Engineer, sand filled temporary crash cushions shall be removed from the site of the work.

MATERIALS

At the Contractor's option, the modules for use in sand filled temporary crash cushions shall be either Energite III Inertial Modules, Fitch Inertial Modules manufactured after March 31, 1997, or equal:

Energite III Inertial Modules manufactured by Energy Absorption Systems, Inc., One East Wacker Drive, Chicago, IL 60601-2076, Telephone 1-312-467-6750, FAX 1-800-770-6755.

Distributor (Northern): Traffic Control Service, Inc., 8585 Thys Court, Sacramento, CA 95828, Telephone 1-800-884-8274, FAX 1-916-387-9734

Distributor (Southern): Traffic Control Service, Inc., 1881 Betmor Lane, Anaheim, CA 92805, Telephone 1-800-222-8274, FAX 1-714-937-1070.

Fitch Inertial Modules, national distributor; Roadway Safety Service, Inc., 1050 North Rand Road, Wauconda, IL 60084, Telephone 1-800-426-0839, FAX 1-847-487-9820.

Distributor: Singletree Sales Company, 1533 Berger Drive, San Jose, CA 95112, Telephone 1-800-822-7735, FAX 1-408-287-1929.

Modules contained in each temporary crash cushion shall be of the same type at each location. The color of the modules shall be the standard yellow color as furnished by the vendor, with black lids. The modules shall exhibit good workmanship free from structural flaws and objectionable surface defects. The modules need not be new. Good used undamaged modules conforming to color and quality of the types specified above may be utilized. If used Fitch modules requiring a seal are furnished, the top edge of the seal shall be securely fastened to the wall of the module by a continuous strip of heavy duty tape.

Modules shall be filled with sand in accordance with the manufacturer's directions, and to the sand capacity in pounds for each module as shown on the plans. Sand for filling the modules shall be clean washed concrete sand of

commercial quality. At the time of placing in the modules, the sand shall contain not more than 7 percent water, as determined by California Test 226.

Modules damaged due to the Contractor's operations shall be repaired immediately by the Contractor at the Contractor's expense. Modules damaged beyond repair, as determined by the Engineer, due to the Contractor's operations shall be removed and replaced by the Contractor at the Contractor's expense.

INSTALLATION

Temporary crash cushion modules shall be placed on movable pallets or frames conforming to the dimensions shown on the plans. The pallets or frames shall provide a full bearing base beneath the modules. The modules and supporting pallets or frames shall not be moved by sliding or skidding along the pavement or bridge deck.

A Type R or P marker panel shall be attached to the front of the crash cushion as shown on the plans, when the closest point of crash cushion array is within 12 feet of the traveled way. The marker panel, when required, shall be firmly fastened to the crash cushion with commercial quality hardware or by other methods approved by the Engineer.

At the completion of the project, temporary crash cushion modules, sand filling, pallets or frames, and marker panels shall become the property of the Contractor and shall be removed from the site of the work. Temporary crash cushion modules shall not be installed in permanent work.

MEASUREMENT AND PAYMENT

Temporary crash cushion modules placed in accordance with the provisions in "Public Safety" elsewhere in these special provisions will not be measured nor paid for.

10-1.21 PROTECTIVE BARRIER

Protective barrier shall be required whenever work is to be performed over or within a horizontal distance of 20 feet from traffic, waterways, adjacent property or railroad property and shall conform to the provisions of the Standard Specifications and these special provisions.

A protective barrier shall consist of a protective cover, netting or other means as approved by the Engineer to prevent any tools, materials, equipment, fluids from construction operations and debris from falling onto the traffic, waterways, adjacent property or railroad property.

PROTECTIVE BARRIER DESIGN AND WORKING DRAWINGS.--The Contractor shall submit to the Engineer working drawings and design calculations for the protective barrier proposed. Such drawings and design calculations shall be stamped and signed by an engineer who is registered as a Civil Engineer in the State of California.

The protective barrier working drawings and design calculations shall conform to Section 5-1.02, "Plans and Working Drawings" of the Standard Specifications and these special provisions.

Working drawings for protective barrier shall be 22 inches x 34 inches in size. For initial review, 10 sets of drawings shall be submitted. After the Engineer has determined that the submittal is complete, between 6 and 12 sets, as requested by the Engineer of corrected drawings and calculations shall be submitted to the Engineer. Within 3 weeks after final approval of the working drawings, six sets of corrected prints on 20 pound (minimum) good quality bond paper, 22 inches x 34 inches in size, prepared by the Contractor, shall be furnished to the Engineer.

Working drawings 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 drawing and design calculation sheet. 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 Engineer will notify the Contractor in writing when a complete set of working drawings and design calculations have been received. When a complete set has been received, the Engineer will require no more than 6 weeks for review of the protective barrier working drawings and design calculations. Should the Engineer fail to review the complete working drawing submittal within the time specified and if, in the opinion of the Engineer, the Contractor’s controlling operation is delayed or interfered with by reason of delay in reviewing the working drawing submittal, an extension of time commensurate with the delay in completion of the work thus caused will be granted in accordance with Section 8-1.09, “Right of Way Delays,” of the Standard Specifications.

Working drawings for the protective barrier shall include stress sheets, shop details, manufacturer product information for any manufactured assemblies to be used, and erection and removal plans. Manufactured assemblies shall conform to the provisions in Section 51-1.06A(2), of the Standard Specifications and these special provisions.

The protective barrier working drawings shall include descriptions and values of all loads, including construction equipment loads and loads imposed upon the existing structure, details and locations of any proposed attachments to the structure, descriptions of equipment to be used and assumed wind loads.

The protective barrier design calculations shall show a summary of computed stresses in the (1) protective barrier, (2) connections between the protective barrier and the existing structure, (3) any fabricated items or assemblies.

Protective barriers shall be designed, as required, in conformance with the provisions in Section 51-1.06, "Falsework," of the Standard Specifications and the following:

The vertical load used for the design of the protective barriers shall be 150 percent of the design load previously specified in Section 51-1.06A(1), "Design Loads" of the Standard Specifications.

The assumed horizontal load to be resisted by the protective barriers shall be the sum of the actual horizontal loads due to equipment, construction sequence, the anticipated wind and other causes, but in no case shall the assumed horizontal load to be resisted in any direction be less than 10 percent of the total dead load plus equipment load.

Whenever protective barrier is located over the roadway, the protective barrier shall extend at least 4 feet beyond the limit of the work underway and be maintained a maximum distance of 10 feet vertically from the work.

Protective barriers shall provide the openings specified under "Maintaining Traffic" of these special provisions, except that when no openings are specified a vertical opening of 15 feet and a horizontal opening equal to the width of the roadway shall be provided for the passage of public traffic.

Protective barriers shall provide minimum clearances as required under "Relations with Railroad Company" of these special provisions for the passage of railroad traffic.

Supports for protective barrier shall not extend below the vertical clearance level nor to the ground line at any location within the roadbed.

The construction and removal of the protective barrier system shall conform to the requirements under "Order of Work" and "Maintaining Traffic" of these special provisions.

Before removal, protective barrier shall be cleaned of all debris and fine material.

The following additional requirements apply to protective covers:

Protective covers shall have a minimum strength equivalent to that provided by good, sound Douglas fir planking having a nominal thickness of 2 inches. Additional layers of material shall be furnished as necessary to prevent fine materials or debris from sifting down upon the traveled way and shoulders.

Protective covers may be used in order to perform work such as cleaning, painting the superstructure, bridge or rivet removal, provided the covers are of sufficient strength to support all loads and are sufficiently tight to prevent dust and fine material from sifting down onto the traveled way. Safety railings shall be installed on all sides of protective covers used to perform work and shall be fully sheathed with plywood.

The Contractor shall allow a minimum of 6 weeks for the review of the protective barrier working drawings and design calculations.

For protective barrier over railroads, approval by the Engineer of the protective barrier working drawings and design calculations will be contingent upon the drawings being satisfactory to the railroad company involved.

Approval by the Engineer of the protective barrier plans or field inspection performed by the Engineer will in no way relieve the Contractor of full responsibility for the protective barrier plan and procedure.

An engineer for the Contractor who is registered as a Civil Engineer in the State of California shall inspect the protective barrier for conformity with the working drawings. The Contractor's registered engineer shall certify in writing that the protective barrier substantially conforms to the details on the working drawings, and that the material and workmanship are satisfactory for the purpose intended. A copy of this certification shall be available at the site of the work at all times.

PAYMENT.--Full compensation for conforming to the above requirements shall be considered as included in the contract prices paid for the various contract items of work involved and no additional compensation will be allowed therefor.

10-1.22 EXISTING HIGHWAY FACILITIES

The work performed in connection with various existing highway facilities shall conform to the provisions in Section 15, "Existing Highway Facilities," of the Standard Specifications and these special provisions.

The Contractor shall provide and install a temporary deck cover plate during the tower lower deck strut modifications while the Pacific Bell Line is being relocated. Full compensation for conforming to these requirements shall be considered as included in the contract prices paid for the various contract items of work involved and no additional compensation will be allowed therefor.

Expansion gratings removed during the work shift shall be restored to their original location at the end of each work shift.

Plans of the existing bridges, including electrical work, scaffolding and travelers may be requested by fax from the Duty Senior Toll-Bridge, District 4 Office, 111 Grand Ave. Oakland, California 94612, Fax number (510) 286-4563.

Plans of the existing bridge available to the Contractor are reproductions of the original contract plans and working drawings and do not necessarily show normal construction tolerances and variances. Where dimensions of new construction required by this contract are dependent on the dimensions of existing bridges, the Contractor shall verify field dimensions for all members prior to submitting working drawings and ordering, fabricating or installing material. The Contractor shall be responsible for adjusting dimensions of the work to fit existing conditions.

Attention is directed to Section 7-1.06, "Safety and Health Provisions," of the Standard Specifications. Work practices and worker health and safety shall conform to the Cal/OSHA Safety Orders Title 8, of the California Code of Regulations including Section 5158, "Other Confined Space Operations."

The existing paint systems on Bridge Number 34-003 consist of lead, chromium and zinc. Any work that disturbs the existing paint system will expose workers to health hazards and will (1) produce debris containing heavy metal in amounts that exceed the thresholds established in Titles 8 and 22 of the California Code of Regulations or (2) produce toxic fumes when heated. All debris produced when the existing paint system is disturbed shall be contained as specified herein.

DEBRIS CONTAINMENT AND COLLECTION PROGRAM.—Prior to starting work, the Contractor shall submit to the Engineer a debris containment and collection program for debris produced when the existing paint system is disturbed in accordance with the provisions in Section 5-1.02, "Plans and Working Drawings," of the Standard Specifications. The program shall identify materials, equipment and methods to be used when the existing paint system is disturbed and shall include working drawings of any containment system, loads applied to the bridge by any containment structure, and provisions for ventilation and air movement for visibility and worker safety.

If the measures being taken by the Contractor are inadequate to provide for the containment and collection of debris produced when the existing paint system is disturbed, the Engineer will direct the Contractor to revise the operations and the debris containment and collection program. The directions will be in writing and will specify the items of work for which the Contractor's debris containment and collection program are inadequate. No further work shall be performed on the items until the debris containment and collection programs are adequate and, if required, a revised program has been approved for the containment and collection of debris produced when the existing paint system is disturbed.

The Engineer will notify the Contractor of the approval or rejection of any submitted or revised debris containment and collection program within 2 weeks of submittal of the Contractor's program or revised program.

The State will not be liable to the Contractor for failure to approve all or any portion of an originally submitted or revised debris containment and collection program, nor for any delays to the work due to the Contractor's failure to submit acceptable programs.

SAFETY AND HEALTH PROVISIONS.—Attention is directed to Section 7-1.06, "Safety and Health Provisions," of the Standard Specifications. Work practices and worker health and safety shall conform to the Construction Safety Orders Title 8, of the California Code of Regulations including Section 1532.1, "Lead."

The Contractor shall furnish to the Engineer a written Code of Safe Practices, and have an Injury and Illness Prevention Program, and a Hazard Communication Program in accordance with the provisions of Construction Safety Orders 1509 and 1510.

Prior to starting work that disturbs the existing paint system and at such times when revisions to the program are required by Section 1532.1, "Lead," the Contractor shall submit the compliance programs required in subsection (e)(2), "Compliance Program," of Section 1532.1, "Lead," of the Construction Safety Orders to the Engineer in accordance with the provisions in Section 5-1.02, "Plans and Working Drawings," of the Standard Specifications. The compliance programs shall include the data specified in subsections (e)(2)(B) and (e)(2)(C) of Section 1532.1, "Lead." Approval of the compliance programs by the Engineer will not be required. The compliance programs shall be reviewed and signed by a Certified Industrial Hygienist (CIH) who is certified in comprehensive practice by the American Board of Industrial Hygiene (ABIH). Copies of all air monitoring or jobsite inspection reports made by or under the direction of the CIH in

accordance with Section 1532.1, "Lead," shall be furnished to the Engineer within 10 days after date of monitoring or inspection.

The CIH shall not be employed or compensated by any subcontractor, or by other persons or entities hired by subcontractors, who will provide other services or material for the project. The CIH may be an employee of the Contractor.

DEBRIS HANDLING.—Temporary storage on the ground of the debris produced when the existing paint system is disturbed will not be permitted. Debris accumulated inside the containment system shall be removed before the end of each work shift. Debris shall be stored in approved leak proof containers and shall be handled in such a manner that no spillage will occur.

Disposal of debris produced when the existing paint system is disturbed shall be performed in accordance with all applicable Federal, State and Local hazardous waste laws. Laws that govern this work include:

1. Health and Safety Code, Division 20, Chapter 6.5 (California Hazardous Waste Control Act).
2. Title 22; California Code of Regulations, Chapter 30 (Minimum Standard for Management of Hazardous and Extremely Hazardous Materials).
3. Title 8, California Code of Regulations.

Except as otherwise provided below, debris produced when the existing paint system is disturbed shall be disposed of by the Contractor at an approved Class 1 disposal facility in accordance with the requirements of the disposal facility operator. The debris shall be hauled by a transporter currently registered with the California Department of Toxic Substances Control using correct manifesting procedures and vehicles displaying current certification of compliance. The Contractor shall make all arrangements with the operator of the disposal facility and perform any testing of the debris required by the operator.

At the option of the Contractor, the debris produced when the existing paint system is disturbed may be disposed of by the Contractor at a facility equipped to recycle the debris, subject to the following requirements:

Copper slag abrasive blended by the supplier with a calcium silicate compound shall be used for blast cleaning.

The debris produced when the existing paint system is disturbed shall be tested by the Contractor to confirm that the solubility of the heavy metals is below regulatory limits and that the debris may be transported to the recycling facility as a non-hazardous waste.

The Contractor shall make all arrangements with the operator of the recycling facility and perform any testing of the debris produced when the existing paint system is disturbed that is required by the operator.

WORK AREA MONITORING.—The Contractor shall perform work area monitoring of the ambient air and soil in and around the work area at the bridge site to verify the effectiveness of the containment system. The work area monitoring shall consist of collecting, analyzing and reporting of air and soil test results, and recommending any required corrective action when specified exposure levels are exceeded. The work area monitoring shall be carried out under the direction of a CIH. The samples shall be collected at locations designated by the Engineer.

Air samples shall be collected and analyzed in accordance with National Institute for Occupational Safety and Health (NIOSH) methods. Lead air samples shall be collected and analyzed in accordance with NIOSH Method 7082, with a limit of detection of at least 0.5 $\mu g/m^3$. Air samples for other metals shall be collected and analyzed in accordance with NIOSH Method 7300, with a limit of detection of at least one percent of the appropriate Permissible Exposure Limits (PELs) of California/Occupational Safety and Health Administration (Cal/OSHA). Alternative methods of sample collection and analysis, with equivalent limits of detection, may be used at the option of the Contractor.

The airborne metals exposure, outside either the containment system or work areas, shall not exceed the lower of either: (1) 10 percent of the Action Level specified for lead by Section 1532.1, "Lead," or (2) 10 percent of the appropriate PELs specified for other metals by Cal/OSHA.

The air samples shall be collected once prior to beginning of work that disturbs the existing paint system and at least once per week during progress of work that disturbs the existing paint system. All air samples shall be analyzed within 48 hours at a facility accredited by the Environmental Lead Laboratory Accreditation Program of the American Industrial Hygiene Association (AIHA). When corrective action is recommended by the CIH, additional samples may be required by the Engineer to be taken, at the Contractor's expense.

Four soil samples each at Bents A and B, Pier W1 and Yerba Buena Island anchorage shall be collected prior to start of work, and four soil samples each at Bents A and B, Pier W1 and Yerba Buena Island anchorage shall be collected within 36 hours following completion of cleaning operations of existing structural steel. Where the cleaning operations

extend over large areas of soil or many separate areas of soil at each bridge site, the samples shall be collected at various times during the contract, as determined by the Engineer. A soil sample shall consist of 5 plugs, each 3/4 inch diameter and 1/2 inch deep, taken at each corner and center of a one foot square area. Soil samples shall be analyzed for total lead, chromium and zinc in accordance with Method 3050 in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," SW-846 published by the United States Environmental Protection Agency.

There shall be no increase in the concentrations of heavy metal in the soil in the area affected when the existing paint system is disturbed. When soil sampling, after completion of work that disturbs the existing paint system, shows an increase in the concentrations of heavy metal, the area affected shall be cleaned and resampled at the Contractor's expense until soil sampling and testing shows concentrations of heavy metal less than or equal to the concentrations collected prior to start of work.

In areas where there is no exposed soil, there shall be no visible increase in the concentrations of heavy metal on the area affected when the existing paint system is disturbed. Any visible increase in the concentrations of heavy metal, after completion of work that disturbs the existing paint system, shall be removed at the Contractor's expense.

Air and soil sample laboratory analysis results, including results of additional samples taken after corrective action as recommended by the CIH, shall be submitted to the Engineer. The results shall be submitted both verbally within 48 hours after sampling and in writing with a copy to the Contractor, within 5 days after sampling. Sample analysis reports shall be prepared by the CIH as follows:

For both air and soil sample laboratory analysis results, the date and location of sample collection, sample number, contract number, bridge number, full name of the structure as shown on the contract plans, and District-County-Route-Post mile will be required.

For air sample laboratory analysis results, the following will be required:

1. List of emission control measures in place when air samples were taken.
2. Air sample results shall be compared to the appropriate PELs.
3. Chain of custody forms.
4. Corrective action recommended by the CIH to ensure airborne metals exposure, outside either the containment system or work areas, is within specified limits.

For soil sample laboratory analysis results, the concentrations of heavy metal expressed as parts per million will be required.

CONTAINMENT SYSTEM.—The containment system shall consist of, at the option of the Contractor, (1) a ventilated containment structure, or (2) vacuum shrouded surface preparation equipment and drapes, tarps or other materials, or (3) equivalent containment system. The containment system shall contain all water, resulting debris, and visible dust produced when the existing paint system is disturbed.

The containment system shall provide the clearances specified under "Maintaining Traffic" of these special provisions, except that when no clearances are specified a vertical clearance of 15 feet and a horizontal clearance of 32 feet shall be provided for the passage of public traffic.

Falsework or supports for the ventilated containment structure shall not extend below the vertical clearance level nor to the ground line at any location within the roadbed.

The ventilated containment structure shall conform to the provisions for falsework in Section 51-1.06, "Falsework," of the Standard Specifications.

The minimum total design load of the ventilated containment structure shall consist of the sum of the dead and live vertical loads. Dead load shall consist of the actual weight of the ventilated containment structure. Live loads shall consist of a uniform load of not less than 45 pounds per square foot, which includes 20 pounds per square foot of sand load, applied over the area supported, and in addition, a moving 1000 pound concentrated load shall be applied to produce maximum stress in the main supporting elements. Assumed horizontal loads need not be included in the design of the ventilated containment structure.

The ventilated containment structure shall be supported with either rigid or flexible supports. The rigid or flexible containment materials on the containment structure shall retain air borne particles but may allow air flow through the containment materials. Flexible materials shall be supported and fastened to prevent escape of abrasive and blast materials due to whipping from traffic or wind and to maintain the clearances.

All mating joints between the ventilated containment structure and the bridge shall be sealed. Sealing may be by overlapping of seams when using flexible materials or by using tape, caulking, or other sealing measures.

Multiple flap overlapping door tarps shall be used at entry ways to the ventilated containment structure to prevent dust or debris from escaping.

Baffles, louvers, flapper seals or ducts shall be used at make-up air entry points to the ventilated containment structure to prevent escape of abrasives and resulting surface preparation debris.

The ventilated containment structure shall be properly maintained while work is in progress and shall not be changed from the approved working drawings without prior approval of the Engineer.

The ventilation system in the ventilated containment structure shall be of the forced input air flow type with fans or blowers.

Negative air pressure shall be employed within the ventilated containment structure and will be verified by visual methods by observing the concave nature of the containment materials while taking into account wind effects, or by using smoke or other visible means to observe air flow. The input air flow shall be properly balanced with the exhaust capacity throughout the range of operations.

The exhaust air flow of the ventilation system in the ventilated containment structure shall be forced into dust collectors (wet or dry) or bag houses.

PROTECTIVE WORK CLOTHING AND HYGIENE FACILITIES.—Wherever there is exposure or possible exposure to heavy metals or silica dust at the bridge site, the Contractor shall, for not more than 5 State personnel: (1) furnish, clean and replace protective work clothing and (2) provide access to hygiene facilities. The furnishing, cleaning and replacement of protective work clothing, and hygiene facilities shall conform to the provisions of subsections (g), "Protective work clothing and equipment," and (i), "Hygiene facilities and practices," of Section 1532.1, "Lead," of the Construction Safety Orders.

The protective work clothing and access to hygiene facilities shall be provided during exposure or possible exposure to heavy metals or silica dust at the bridge site and application of the undercoats of paint.

Protective work clothing and hygiene facilities shall be inspected and approved by the Engineer before being used by State personnel.

The protective work clothing shall remain the property of the Contractor at the completion of the contract.

PAYMENT.—Full compensation for the containment system, protective work clothing and access to hygiene facilities for State personnel; and handling of debris produced when the existing paint system is disturbed, including testing, hauling, treatment, disposal fees and local taxes, shall be considered as included in the contract price paid for the item of work requiring the disposal of the debris produced when the existing paint system is disturbed and no additional compensation will be allowed therefor.

Work area monitoring will be paid for on the basis of a lump sum price.

The contract lump sum price paid for work area monitoring shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in collecting and analyzing of samples of ambient air and soil for heavy metals, complete in place, including reporting the test results, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

10.1.22A JACK BRIDGE

The work shall consist of temporarily supporting the structure, removing existing rocker bearings and assemblies, and install PTFE and PTFE spherical bearings in accordance with the details shown on the plans and these special provisions.

PTFE and PTFE spherical bearings shall conform to the provisions in "PTFE Bearing" and "PTFE Spherical Bearings", respectively of these special provisions.

GENERAL.--The Contractor shall be responsible for the methods and equipment used to raise and support the existing structure for replacement of bearings. The Contractor shall be responsible for the design of the temporary supports.

The Contractor shall submit to the Engineer complete details and working drawings of the methods and equipment he proposes to use for replacement of bearings, including the construction and installation methods to obtain full bearing of the new bearings in accordance with the provisions in Section 5-1.02, "Plans and Working Drawings," of the Standard Specifications.

The supports and jacking equipment shall accommodate the loads shown on the plans and any additional loads due to the Contractor's operations. Jacking assemblies and temporary supports shall be designed and constructed in conformance with the requirements in Section 51-1.06, "Falsework," of the Standard Specifications and these special provisions. The grade of the superstructure shall be restored to the existing elevation prior to the bearing replacement.

The Contractor shall allow 6 weeks for the review of jacking assembly and temporary support working drawings and design calculations.

Section 51-1.06A, "Falsework Design and Drawings," of the Standard Specifications is amended by adding the following after the first paragraph:

The falsework drawings shall include details of the falsework removal operations showing the methods and sequences of removal and equipment to be used.

The seventeenth paragraph of Section 51-1.06A is amended to read:

Temporary bracing shall be provided, as necessary, to withstand all imposed loads during erection, construction and removal of any falsework. The falsework drawings shall show provisions for such temporary bracing or methods to be used to conform to this requirement during each phase of erection and removal. Wind loads shall be included in the design of such bracing or methods.

The fifth paragraph of Section 51-1.06A(1), "Design Loads," of the Standard Specifications is amended to read:

The minimum horizontal load to be allowed for wind on heavy-duty steel shoring or steel pipe column falsework having a vertical load carrying capacity exceeding 30 kips per leg or column shall be the sum of the products of the wind impact area, shape factor, and the applicable wind pressure value for each height zone. The wind impact area is the total projected area of all the elements in the tower face or falsework bent normal to the direction of the applied wind. The shape factor shall be taken as 2.2 for heavy-duty shoring and 1.0 for pipe column falsework. Wind pressure values shall be determined from the following table:

Height Zone (Feet above ground)	Wind Pressure Value	
	Shores or Columns Adjacent to Traffic	At Other Locations
0 to 30	20 psf	15 psf
30 to 50	25 psf	20 psf
50 to 100	30 psf	25 psf
Over 100	35 psf	30 psf

The first 2 sentences of the sixth paragraph of Section 51-1.06A(1), "Design Loads," of the Standard Specifications are amended to read:

The minimum horizontal load to be allowed for wind on all other types of falsework, including falsework supported on heavy-duty shoring or pipe column falsework, shall be the sum of the products of the wind impact area and the applicable wind pressure value for each height zone. The wind impact area is the gross projected area of the falsework and any unrestrained portion of the permanent structure, excluding the areas between falsework bents or towers where diagonal bracing is not used.

The second entry under "Timber" in the second paragraph of Section 51-1.06A(2), "Design Stresses, Loadings, and Deflections," of the Standard Specifications is amended to read:

Compression parallel to the grain .... $\frac{480{,}000}{(L/d)^2}$ psi, but not to exceed 1,600 psi.

The last paragraph under "Timber" in the second paragraph of Section 51-1.06A(2), "Design Stresses, Loadings, and Deflections," of the Standard Specifications is amended to read:

Timber connections shall be designed in accordance with the procedures, stresses and loads permitted in the Falsework Manual as published by the Department of Transportation, Division of Structures, Office of Structure Construction.

The third paragraph of Section 51-1.06B “Falsework Construction” of the Standard Specifications is amended to read:

When falsework is supported on piles, the piles shall be driven and the actual bearing value assessed in conformance with Section 49, “Piling,” as specified in these specifications.

For falsework piles with a calculated loading capacity greater than 100 tons, the contractor shall conduct dynamic monitoring of pile driving and conduct penetration and bearing analyses based on a wave equation analysis. Said analysis shall be signed by an Engineer who is licensed as a Civil Engineer in California and submitted to the Engineer prior to completion of falsework erection.

The first paragraph of Section 51-1.06C, "Removing Falsework," of the Standard Specifications is amended to read:

Falsework supporting any span of a simple span bridge shall not be released before 10 days after the last concrete, excluding concrete above the bridge deck, has been placed. Unless otherwise permitted by the Engineer, falsework supporting any span of a continuous or rigid frame bridge shall not be released before 10 days after the last concrete, excluding concrete above the bridge deck, has been placed in that span and in the adjacent portions of each adjoining span for a length equal to at least 1/2 the length of the span where falsework is to be released.

Section 51-1.06C, "Removing Falsework," of the Standard Specifications is amended by adding the following after the seventh paragraph:

Unless otherwise specified, removing falsework supporting any span of structural members subject to bending, shall conform to the requirements for removing falsework supporting any span of a simple span bridge.

The maximum loading and deflections used on jacks, brackets, and other manufactured devices shall not exceed the manufacturer's recommendations. If requested by the Engineer, the Contractor shall furnish engineering data from the manufacturer verifying the manufacturer's recommendations or shall perform tests as necessary to demonstrate the adequacy of any such device proposed for use. Adequate means shall be employed to prevent unplanned lateral and longitudinal movement of the superstructure. The temporary supports, jacks, and the superstructure shall be stable during all phases of the operation.

A redundant system of supports for back-up should the primary lowering system fail shall be provided. Such redundant system shall include stacks of steel plates that will be removed one by one as the superstructure is lowered. Steel plates shall be maintained to within 1/4 inch of the superstructure during the entire jacking and lowering process.

Temporary supports, and jacking assemblies shall remain in place as required to support the structure until the substructure or other supports, shown on the plans, have been completed and have attained the specified strength at the transfer of the superstructure load to the said substructure or supports. The concrete shall attain a compressive strength of 2600 pounds per square inch or 80 percent of the specified strength, whichever is greater.

Displacement monitoring equipment shall be provided and maintained. Vertical and horizontal displacements of installed temporary shoring posts and the existing structure shall be monitored continuously during the jacking operations and shall be accurately measured and recorded at least weekly during repair work.

Should unanticipated displacements, cracking or other damage occur, the construction shall be discontinued until corrective measure satisfactory to the Engineer are performed.

Additions or modifications to the structure, in connection with jacking, and the jacking assemblies shall be subject to approval of the Engineer.

The superstructure shall be jacked and adjusted to grade uniformly and in such a manner that a roadway satisfactory for the use of public traffic is provided in conformance with the provisions in Section 7-1.08, "Public Convenience," of the Standard Specifications.

Jacking operations shall be carried out in a uniform manner so that no distortion that would cause excessive stress or damage will be jacked into the superstructure. Jacking shall be limited to the minimum necessary to install new bearing, in no case more than 1/2 inch higher than the final grade. Tell-tales shall be provided to monitor actual movement.

Removing the existing bearings shall conform to the requirements in Section 15-4, "Bridge Removal," of the Standard Specifications.

Damage to the structure as a result of the Contractor's operations shall be repaired or replaced in accordance with the requirements for new work of similar character by the Contractor at his expense.

When replacement operations have been completed, all temporary falsework, supports, cribbing and blocking, jacking assemblies, strengthening members, and removed bearing pads shall be disposed of in conformance with the requirements in Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications.

PAYMENT.--Jack bridge will be paid for on the basis of a lump sum price. The contract lump sum price paid for jacking superstructure shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in jacking the superstructure, including shimming at bearing pads, and removing existing rocker bearing and assemblies, complete in place as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

10-1.22B RELOCATE MISCELLANEOUS FACILITIES

This work consists of resetting, relocating and where necessary reconstructing existing miscellaneous facilities that interfere with the retrofit work as shown on the structure plans. Where necessary, miscellaneous facilities shall be temporarily supported during the retrofit work until they are reinstalled to the retrofitted structure.

The types of existing miscellaneous facilities to be relocated shall consist of, but not be limited to, the following:

Work platforms, platform railing and pipe hangers
Barrier
Ladder
Utility outlet stations
Utility cabinet
Curb and sidewalk
Cover plates
Air lines
Navigation equipment
Seismic monitoring equipment
Conduits
Deck expansion floor joints

Existing miscellaneous facilities are shown on the structure plans, as-built plans or as-built shop drawings.

Unless otherwise shown on the plans, new miscellaneous facilities connections shall be at least equal in strength to the existing connections as approved by the Engineer. New steel components for steel connections shall conform to the requirements in “Steel Structures” elsewhere in these special provisions. New steel components for concrete connections shall conform to the requirements in Section 75, "Miscellaneous Metal," of the Standard Specifications.Existing miscellaneous facilities shall be protected from damage during relocation. Facilities damaged due to the Contractor’s operations shall be repaired to original condition as approved by the Engineer at the Contractor’s expense.

For each type of facility to be relocated and two weeks before facility relocation work begins, the Contractor shall submit to the Engineer for approval a facility relocation plan. The facility relocation plan shall show details, materials, method and equipment to be used for the relocation of each facility. The facility relocation plan shall include working drawings and design calculations for the proposed method of temporarily supporting the facilities and reinstalling the facilities to the retrofitted member and all new metal components and attachment hardware as necessary for connection to the retrofitted structure. The facility relocation plan submittal shall be in accordance with the provisions in Section 5-1.02, “Plans and Working Drawings,” of the Standard Specifications. Facility relocation work shall not begin until the Contractor’s facility relocation plan has been approved by the Engineer.

All work involved in relocating existing miscellaneous facilities shown on the structure plans, as-built plans or as-built working drawings shall be considered as included in the various items of work involved and no additional compensation will be allowed therefor.

All work involved in relocating existing miscellaneous facilities not shown on the structure plans, as-built plans or as-built working drawings shall be directed by the Engineer and will be paid for as extra work as provided in Section 4-1.03D of the Standard Specifications.

10-1.22C BRIDGE REMOVAL (PORTION)

Removing portions of bridge shall conform to the requirements in Section 15-4, "Bridge Removal," of the Standard Specifications and these special provisions.

Bridge removal (portion) shall consist of removing portions of the bridge as shown on the plans, including cutting, grinding, and milling of existing steel, removing existing concrete, and removing rivet heads flush where the rest of the rivet shall remain.

All removed materials that are not to be salvaged or used in the reconstruction shall become the property of the Contractor and shall be disposed of outside the highway right of way in accordance with the provisions in Section 7-1.13 of the Standard Specifications.

10-1.22D REMOVE RIVET

Removing rivets shall conform to the requirements in Section 15, "Existing Highway Facilities," and Section 55, "Steel Structures," of the Standard Specifications and these special provisions.

Attention is directed to Section 7-1.09, “Public Safety,” and Section 7-1.12, “Responsibility for Damage,” of the Standard Specifications.

Furnishing and installing bolts at rivet removal locations, as shown on the plans, will be measured and paid for as specified in "Steel Structures," elsewhere in these special provisions.

Sound control shall conform to the provisions in "Sound Control Requirements" elsewhere in these special provisions.

The Contractor shall submit to the Engineer for approval the proposed method for rivet removal in accordance with the requirements in Section 5-1.02, "Plans and Working Drawings," of the Standard Specifications. Rivet removal will not be permitted until the removal method has been approved by the Engineer. The Engineer will notify the Contractor one week after receipt of the Contractors submittal whether the proposed methods are approved or rejected. In the event that the Engineer determines that rivet removal work is resulting in damage to the existing steel, the Contractor shall cease rivet removal operations until a new proposed method for rivet removal has been approved by the Engineer.

Rivets to be removed shall have their head chipped off and the shank driven, drilled, or cored out as required. Care shall be taken not to enlarge rivet holes or to damage remaining material. Burning will not be permitted. The Contractor shall demonstrate removal methods using heat to the Engineer. Heat resulting from any removal method shall not damage rivet holes or the surrounding materials.

Where existing rivets are removed, and the resulting holes require enlargement, the holes shall be enlarged by not more than 1/16 inch in diameter greater than the nominal bolt diameter shown on the plans. Holes shall be enlarged by reaming.

At locations where surrounding material has been damaged as a result of the Contractor's operations, the surrounding material shall be repaired. When reaming of more than 1/16-inch in diameter greater than the nominal bolt diameter shown on the plans and installing an oversize bolt is required for the repair, the reaming, furnishing and installing of oversized bolts shall be at the Contractor's expense.

At locations where rivet holes contain cracked, torn, or otherwise damaged material due to conditions other than the Contractor’s operations, the Contractor shall ream the hole and install an oversized bolt. Additional reaming more than 1/16 inch in diameter than the nominal bolt diameter shown on the plans, including the difference between the actual cost of the bolt shown on the plans and the oversized bolt, shall be done as directed by the Engineer and will be paid for as extra work as provided in Section 4-1.03 D of the Standard Specifications. Installing oversized bolts shall be at the Contractor's expense.

Inside surfaces of holes remaining after rivet removal and reaming shall be painted in accordance to and be measured and paid for as specified for existing steel surfaces in “Clean and Paint Structural Steel" elsewhere in these special provisions.

Remove rivet will be measured and paid for by unit.

The contract unit price paid for remove rivet shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all work involved in removing rivets, including submitting the proposed method for rivet removal, as shown on the plans, as specified in these special provisions, and as directed by the Engineer.

Full compensation for enlarging rivets holes by not more than 1/16 inch in diameter greater than the nominal bolt diameter shown on the plans, shall be considered as included in the contract unit price paid for remove rivet and no additional compensation will be allowed therefor.

10-1.22E MODIFY WATER AND AIR LINES (BRIDGE)

Modify water and air lines shall consist of modifying water lines and air lines. Water and air lines shall be of the size shown and shall conform to the details shown on the plans.

Working drawings.--The Contractor shall submit complete working drawings to the Office of Structure Design, Documents Unit, P.O. Box 942874, Sacramento, CA 94274-0001 (1801 30th Street, Sacramento, CA 95816), telephone (916) 227-8230, in accordance with the provisions in Section 5-1.02, "Plans and Working Drawings," of the Standard Specifications.

The working drawings shall show the temporary support of the water and air lines and shall be supplemented by manufacturer's descriptive data, performance data and installation instructions for the following:

Expansion Assembly

Pipe and fittings
Mechanical coupling
Air hose
Water hose
Hose union
Gate valve
Ball valve
Pipe rollers
Pipe supports

For initial review, 5 sets of drawings shall be submitted. After review, between 6 and 12 sets, if requested by the Engineer, shall be submitted to the said Office for final approval and use during construction.

MATERIALS:--

Pipe and fittings for water and air line less than 4 inches.--Pipe and fittings for water and air line shall be schedule 40 galvanized steel pipe conforming to ASTM Designation: A 53 or A 106, with 150-pound galvanized malleable iron banded screwed fittings and galvanized steel couplings. The weight of the zinc coating shall be not less than 90 percent of that specified in ASTM Designation: A 53.

Where shown on the plans, mechanical couplings shall be rigid type for grooved end pipe, self-centering and shall engage and lock in place in a positive airtight couple.

Coupling housing clamps shall be fabricated in 2 or more parts of malleable iron castings conforming to the specifications of ASTM Designation: A47 Grade 32510. Housing clamps shall hold in place a molded (synthetic rubber composition) air-sealing gasket designed such that internal pressure increases sealing pressure. Couplings shall be coated with rust inhibiting vinyl alkyd coating.

The coupling assembly shall be securely held together by 2 or more stainless steel bolts; track-head, square or oval-neck head. Bolts and nuts shall be 18-8 stainless and shall be as specified in ASTM Designation: F593.

Pipe and fittings for water and air line 4 inches and larger.--Pipe and fittings for water and air line shall be schedule 40 steel pipe conforming to ASTM Designation: A 53 or A 106. Pipe and fittings shall be grooved end for mechanical coupling, unless otherwise shown on the plans.

Where shown on the plans, flanges shall be ANSI class 125. Connections to existing flanged pipe shall be by flange by groove adapter.

Mechanical couplings for grooved end pipe shall be rigid type, self-centering and shall engage and lock in place in a positive airtight couple.

Coupling housing clamps shall be fabricated in 2 or more parts of malleable iron castings conforming to the specifications of ASTM Designation: A47 Grade 32510. Housing clamps shall hold in place a molded (synthetic rubber composition) air-sealing gasket designed such that internal pressure increases sealing pressure. Couplings shall be coated with rust inhibiting vinyl alkyd coating.

Where shown on the plans welding shall be as specified in “Welding Quality Control” elsewhere in these Special Provisions.

The coupling assembly shall be securely held together by 2 or more stainless steel bolts; track-head, square or oval-neck head. Bolts and nuts shall be 18-8 stainless and shall be as specified in ASTM Designation: F593.

Where specifically noted on the plans, flexible coupling shall be for grooved end pipe, same manufacturer as rigid type, flexible type, self-centering and shall engage and lock in place in a positive airtight couple.

Air hose.--Air hose shall be oil resistant tube, high tensile textile braid reinforced carcass type with union ends designed for air service, bend radius 3x diameter maximum, working pressure 175 psig minimum, and cover designed for exposure to oils and ozone.

Union ends shall be grooved coupling, hose nipple type, designed for joining hose to grooved pipe fittings. Nipple shall be aluminum, with elastomer seals and rated for hose pressure (minimum). Union ends for pipe less than 4 inches may be threaded coupling, hose nipple type.

Water hose.—Water hose shall be EDPM or SBR tube, high tensile textile braid reinforced carcass type with union ends designed for water service, bend radius 3x diameter maximum, working pressure 175 psig minimum, and extra thick cover designed for exposure to oils and ozone.

Union ends shall be grooved coupling, hose nipple type, designed for joining hose to grooved pipe fittings. Nipple shall be aluminum, with elastomer seals and rated for hose pressure (minimum). Union ends for pipe less than 4 inches may be threaded coupling, hose nipple type.

Gate valve.--Gate valve shall be AWWA iron body with bronze trim, double disc, hub or rubber ring type, removable bonnet and non-rising stem, equipped with oversize wheel and 200-pound working pressure. Valve shall be Mueller, A-2380; American Valve, Model 28; or equal.

Ball valve.-- Ball valve shall be two piece, minimum 400-pound WOG, stainless steel body and chrome plated or brass ball with full size port.

Pipe roller.—Pipe roller shall be galvanized, cast iron roll with galvanized, steel roll rod and nuts. At the Contractor's option, a steel chair or hanger style may be used. Pipe roller shall be sized for pipe diameter.

Pipe supports.--Pipe supports shall be channel type and shall be 1 5/8" x 1 5/8", 12-gage galvanized steel with 17/32 inch diameter bolt holes, 11/2 inches on center in the base of the channel. Double channel shall be pre-manufactured back to back style. Clamps shall be 2 piece bolted with rubber isolator between pipe and clamp. Pipe supports shall be Unistrut; Kin-Line; or equal.

Structural steel.--Miscellaneous structural steel, including plate, angle iron, and threaded rod shall conform to the provisions in Section 55, "Steel Structures," of the Standard Specifications. Miscellaneous nuts, bolts and related hardware shall be hot dip galvanized, ASTM Designation: A 325.

INSTALLATION--

Water and air lines on bridge structures shall be supported as shown on the plans and in conformance with these special provisions.

Water and air main lines shall be capped as soon as branch lines are removed. Each 4-inch or 6-inch main line may be depressurized a maximum of 5 days (total) for removal of all branch lines and a maximum of 5 days (total) during installation of all new branch lines. The days may be taken concurrently.

Water and air main lines shall be fitted with caps or plugs such that the main lines can be re-energized to provide compressed air or water to other portions of the bridge.

Where vertical airline is removed or disconnected for more than 5 consecutive days, a temporary air hose of the same size as the removed airline shall be installed and connected to the upper deck outlet until the replacement airline is installed.

When the water supply to the upper deck wharf hydrants is interrupted, the wharf hydrants shall be completely wrapped in black plastic to indicate they are out of service. Wharf hydrants shall be out of service a maximum of 12 hours. At the Contractors option, a pressure rated temporary hose, same size as the pipe, may be used to keep the wharf hydrants operational during the Structural work.

Core concrete.—Concrete coring shall be as specified in "Core Concrete" elsewhere in these Special Provisions.

Cleaning and closing of pipe.--The interior of all pipe to be installed shall be cleaned before installation. All openings shall be capped or plugged as soon as the pipe is installed to prevent the entrance of any materials. The caps or plugs shall remain in place until their removal is necessary for completion of the installation.

Painting of pipe.--The exterior of installed water and air lines shall be prime coated as specified on the plans. The exterior of installed water and air lines shall be finish coated as specified for structural steel in "Cleaning and Painting Structural Steel" elsewhere in the Special Provisions.

TESTING.--

Water and air lines less than 12-inch diameter shall be tested in accordance with the provisions in Section 20-5.03H(1), "Method A," of the Standard Specifications, except that the initial testing period shall be 4 hours minimum with no leakage or pressure drop.

The Contractor shall furnish and remove temporary pipe anchorage, if required, to resist thrust forces during testing. All leaks shall be repaired and the Contractor at his expense shall replace all defective materials.

Branch lines shall be tested individually from ball valve to upper deck outlet. Main lines and those portions of the branch lines upstream of the ball valve shall be tested as a whole or in sections.

MEASUREMENT AND PAYMENT.--

The contract lump sum price paid for modify water and air line (bridge) shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all work involved in modifying water and air lines, complete in place, as shown on the plans, and as specified in the Standard Specifications and these Special Provisions, and as directed by the Engineer.

Full compensation for removing piping and equipment, furnishing and installing pipe, pipe supports, hose, valves, and other appurtenances, painting, core concrete, testing and checking, shall be considered as included in the contract lump sum price paid for modify water and air line (bridge) and no additional compensation will be allowed therefor.

10-1.23 CONCRETE STRUCTURES

Portland cement concrete structures shall conform to the provisions in Section 51, "Concrete Structures," of the Standard Specifications and these special provisions.

GENERAL.--

Concrete for Pier W4 damper anchorage shall be placed in lifts no greater than 4 feet. Concrete lifts shall not be placed until the concrete in the previous lift has obtained a compressive strength of at least 2500 psi or has attained an age of 5 days, whichever occurs first, unless otherwise permitted by the Engineer.

Formlines of exposed concrete surfaces shall match in general the formlines of exposed existing concrete surfaces.

Shotcrete shall not be used as an alternative construction method for reinforced concrete members unless otherwise specified.

The first sentence of the tenth paragraph in Section 51-1.05, “Forms,” of the Standard Specifications is amended to read:

> Form panels for exposed surfaces shall be plywood conforming to or exceeding the requirements of U.S. Product Standard PS 1 for Exterior B-B (Concrete Form) Class I Plywood or any material which will produce a smooth uniform concrete surface substantially equal to that which would result from the use of such plywood.

The third paragraph in Section 51-1.15, "Drains in Walls," of the Standard Specifications is amended to read:

> In addition to the drain holes and weep holes specified in the preceding paragraph, holes approximately 3 inches in diameter for relief of hydrostatic pressure shall be provided at the bottom of walls, immediately above the footing, at approximately 15-foot centers.

The second paragraph in Section 51-1.22, "Measurement," of the Standards Specifications is amended to read:

> The estimated quantity of concrete for minor structures designated as final pay in the Engineer's Estimate will not be revised as specified in Section 9-1.015, "Final Pay Items," of the Standard Specifications, when the constructed height of said minor structure, including revisions by the Engineer, is within 0.5-foot of the vertical dimension shown on the plans.

When a roughened concrete surface is shown on the plans, the existing concrete surface shall be roughened to a full amplitude of approximately 1/4-inch by abrasive blasting, water blasting or mechanical equipment.

INJECTABLE CONCRETE.--Injectable concrete shall conform to Section 90, "Portland Cement Concrete," of the Standard Specifications and these special provisions.

Coarse aggregate for injectable concrete shall conform to the requirements for 1/2" x No. 4 in "Aggregate Gradings" of these special provisions.

The nominal penetration of injectable concrete shall be from 3 1/2 to 4 1/2 inches with a maximum value of 5 inches. The nominal and maximum penetrations given shall be used instead of the penetrations listed in the table in Section 90-6.06, "Amount of Water and Penetration," of the Standard Specifications. Type F or Type G chemical admixtures may be required to achieve the specified penetration. When admixtures are used in accordance with the requirements in Section 90-4, "Admixtures," of the Standard Specifications, the penetration of the concrete will be measured after the admixture is added.

When used where concrete strengths in excess of 3,250 psi are specified, prequalification of the proposed mix design, as provided for in 90-9.01, "General," of the Standard Specifications, will be required.

Injectable concrete will be measured and paid for as structural concrete, bridge.

AGGREGATE GRADINGS.--The aggregate grading of concrete for injectable concrete shall conform to the following requirements for the 1/2 inch maximum combined aggregate grading and the 1/2" x No. 4 primary aggregate nominal size:

The following gradation is added to the table in the third paragraph in Section 90-3.01, "General", of the Standard Specifications:

Nominal Size Primary Aggregate	Sieve Size	Limits of Proposed Gradation
1/2" x No. 4	3/8"	50 - 85

The following table is added to the first paragraph in Section 90-3.02, "Coarse Aggregate Grading," of the Standard Specifications:

	Percentage Passing Primary Aggregate Nominal Size 1/2" x No. 4	
Sieve Sizes	Operating Range	Contract Compliance
3/4"	100	100
1/2"	90 - 100	88 - 100
3/8"	X ± 15	X ± 22
No. 4	0 - 15	0 - 18
No. 8	0 - 6	0 - 7

Section 90-3.04, "Combined Aggregate Gradings," of the Standard Specifications is amended by adding the grading limits of combined aggregates for the 1/2" x No. 4 primary aggregate size as follows:

Sieve Sizes	Percentage Passing 1/2" Max.
3/4"	100
1/2"	90 - 100
3/8"	50 - 100
No. 4	45 - 60
No. 8	35 - 55
No. 16	25 - 40
No. 30	15 - 25
No. 50	5 - 15
No. 100	1 - 8
No. 200	0 - 4

MEASUREMENT AND PAYMENT.--Measurement and payment for concrete in structures shall conform to the provisions in Sections 51-1.22, "Measurement," and 51-1.23, "Payment," of the Standard Specifications and these special provisions.

Full compensation for roughening existing concrete surfaces to a full amplitude of approximately 1/4-inch, where shown on the plans, shall be considered as included in the contract price paid per cubic yard for structural concrete, bridge and no separate payment will be made therefor.

10-1.24 PTFE SHEET

PTFE sheets , consisting of polytetrafluoroethylene (PTFE) surfacing, and stainless and steel plates, shall conform to the details shown on the plans and the provisions in Section 51, "Concrete Structures," of the Standard Specifications and these special provisions.

The manufacturer shall furnish certificates of compliance in accordance with Section 6-1.07, "Certificates of Compliance," of the Standard Specifications for all material used in the PTFE sheets .

PTFE sheet shall be made from unfilled PTFE resin and shall conform to the following requirements:

Test	Test Method	Requirements
Tensile strength (Minimum)	ASTM D 1457	2800 psi
Elongation (Minimum)	ASTM D 1457	200 %

The PTFE resin shall be virgin material (not reprocessed) meeting the requirements of ASTM Designation: D 1457. Specific gravity shall be from 2.13 to 2.19. Melting point shall be 623° F. (±2° F.).

Stainless steel plates shall conform to the requirements of ASTM Designation: A 240, Type 304.

Steel plates, except stainless steel, shall conform to the requirements of ASTM Designation: A 709.

Welding of structural steel shall conform to the requirements of AWS D1.1.

The PTFE sheet shall be adhesive bonded to the steel plate. The adhesive material shall be an epoxy resin conforming to the requirements of Federal Specification: MMM-A-134.

Contact surfaces of PTFE sheet and steel plate to be bonded shall be uniformly roughened to a minimum roughness height value of 250 micro-inches.

The side of the PTFE sheet to be bonded shall be factory treated by the sodium naphthalene or sodium ammonia process, after the contact surface is roughened.

After completion of the bonding operation the PTFE surface shall be smooth and free from bubbles. The PTFE sheet shall show no signs of delamination and shall be fully bonded to the steel plate.

The stainless steel plate shall be perimeter welded to the steel load plate. Stainless steel electrodes shall be used in accordance with the requirements of the electrode manufacturer.

After completion of the mechanical connection or weld operation, the stainless steel plate shall be smooth and free from waves.

The flatness of the plates shall be controlled such that the PTFE/stainless steel sliding interface shall be in full bearing.

The mating surface of the stainless steel plate with the PTFE surfacing shall have a surface finish of less than 10 micro inches root-mean-square (rms), determined according to ANSI Standard B46.1. The sliding element shall have a first movement static coefficient of friction not exceeding 0.06.

Metal surfaces of bearings exposed to the atmosphere in the completed work, except stainless steel surfaces, shall be cleaned and painted in accordance with the requirements in "Clean and Paint Structural Steel" elsewhere in these special provisions.

PTFE and stainless steel surfaces shall be protected from contamination and weather damage.

Full compensation for PTFE sheets, including stainless, steel plates, high strength fastener assemblies, and bonding shall be considered as included in the contract price paid per pound for furnish structural steel and no separate payment will be allowed therefor.

10-1.25 PTFE BEARING

PTFE bearings, consisting of steel reinforced elastomeric bearing pads, polytetrafluoroethylene (PTFE) surfacing, and stainless and steel plates, shall conform to the details shown on the plans and the provisions in Section 51, "Concrete Structures," of the Standard Specifications and these special provisions.

The Contractor shall submit to the Engineer for approval in accordance with the provisions in Section 5-1.02, "Plans and Working Drawings," working drawings of the PTFE bearings. For initial review, 4 sets of such drawings shall be submitted. After review, between 6 and 12 sets, as requested by the Engineer, shall be submitted to the said Office for final approval and for use during construction.

Working drawings shall be 22" x 34" or 11" x 17" in size and each drawing and calculation sheet shall include the job site name of the structure as shown on the contract plans, District-County-Route, bridge number, and contract number.

Working drawings shall be submitted sufficiently in advance of the start of the affected work to allow time for review by the Engineer and correction by the Contractor of the drawings without delaying the work. Such time shall be 6 weeks after complete drawings and all support data are submitted. The location of match marks on plate edges shall be shown on the working drawings.

At the completion of each structure on the contract, one set of reduced prints on 20 pound (minimum) bond paper, 11 inches by 17 inches in size, of the corrected original tracings of all working drawings for each structure shall be furnished to the Engineer. Reduced prints of drawings which are common to more than one structure shall be submitted for each structure. An index prepared specifically for the drawings for each structure containing sheet numbers and titles shall be included on the first reduced print in the set for each structure. Reduced prints for each structure shall be arranged in the order of drawing numbers shown in the index.

The edge of the corrected original tracing image shall be clearly visible and visually parallel with the edges of the page. A clear, legible symbol shall be provided as near to the upper left side of each page as is feasible within the original print to show the amount of reduction and a horizontal and vertical scale shall be provided on each reduced print to facilitate enlargement to original scale.

The manufacturer shall furnish certificates of compliance in accordance with Section 6-1.07, "Certificates of Compliance," of the Standard Specifications for all material used in the PTFE bearings.

The shear modulus of the elastomer in the elastomeric bearing pads shall be 110±11 psi.

PTFE sheet shall be made from unfilled PTFE resin and shall conform to the following requirements:

Test	Test Method	Requirements
Tensile strength (Minimum)	ASTM D 1457	2800 psi
Elongation (Minimum)	ASTM D 1457	200 %

The PTFE resin shall be virgin material (not reprocessed) meeting the requirements of ASTM Designation: D 1457. Specific gravity shall be from 2.13 to 2.19. Melting point shall be 623° F. (±2° F.).

The PTFE sliding surface shall be provided with lubricant dimples with a maximum diameter of 0.32 inch, a minimum depth of 0.08 inch and a maximum depth of one half of the PTFE sheet thickness. The dimples shall be uniformly distributed within the area 1/4 inch from the edges of the PTFE sheet and occupy between 20 percent and 30 percent of the PTFE sheet area.

Stainless steel plates shall conform to the requirements of ASTM Designation: A 240, Type 304.

Steel plates, except stainless steel, shall conform to the requirements of ASTM Designation: A 709.

Welding of structural steel shall conform to the requirements of AWS D1.1.

The PTFE sheet shall be adhesive bonded in the recess of steel plate under controlled factory conditions. The adhesive material shall be an epoxy resin conforming to the requirements of Federal Specification: MMM-A-134.

Contact surfaces of PTFE sheet and steel plate to be bonded shall be uniformly roughened to a minimum roughness height value of 250 micro-inches.

The side of the PTFE sheet to be bonded shall be factory treated by the sodium naphthalene or sodium ammonia process, after the contact surface is roughened.

After completion of the bonding operation the PTFE surface shall be smooth and free from bubbles. The PTFE sheet shall show no signs of delamination and shall be fully bonded in the recess.

The stainless steel plate shall be bonded to the steel sole plate under pressure using epoxy resin adhesive and then mechanically connected with 18-8 stainless steel cap screws. At the Contractor's option, the stainless steel plate may be perimeter welded to the sole plate. Stainless steel electrodes shall be used in accordance with the requirements of the electrode manufacturer.

After completion of the mechanical connection or weld operation, the stainless steel plate shall be smooth and free from waves.

The flatness of the bearing elements shall be controlled such that upon completion of the bearing assembly the PTFE/stainless steel sliding interface shall be in full bearing.

The mating surface of the stainless steel plate with the PTFE surfacing shall have a surface finish of less than 10 micro inches root-mean-square (rms), determined according to ANSI Standard B46.1. The sliding element of the production bearings shall have a first movement static coefficient of friction not exceeding 0.06 when tested without the coating of silicone grease.

Steel reinforced elastomeric bearing pads shall be fully vulcanized to the steel plates under factory controlled conditions and the bond shall have a peel-strength of at least 30 pounds per inch as determined by California Test 663.

Metal surfaces of bearings exposed to the atmosphere, or in contact with structural steel or concrete in the completed work, except stainless steel surfaces, shall be cleaned and painted in accordance with the provisions in "Clean and Paint Structural Steel" elsewhere in these special provisions. Finish coats will not be required on the bearings.

After installation the top of the assembly shall be removed and a 1/16 inch thick coating of silicone grease shall be applied to the entire PTFE surface and the bearing reassembled without damage to the mating sliding surfaces. Silicone grease shall conform to Military Specification: MIL-S-8660.

Damaged bearings and bearings with scratched mating surfaces shall be returned to the factory for replacement or resurfacing.

Prior to proof testing, all individual components shall be permanently die-stamped on 2 of 4 sides with markings consisting of bearing number and contract number. Each bearing shall have a unique bearing number and match marks on plate edges to insure correct assembly at the job site.

Full sized PTFE bearings shall be proof tested and evaluated for compression and coefficient of friction in the presence of the Engineer, unless otherwise directed. The proof tests shall be performed on samples randomly selected by the Engineer from the production bearings to be used in the work. Proof testing shall be performed by the Contractor at the manufacturer's plant or at an approved laboratory. If proof tests are not performed at the specified load, the Contractor shall perform additional physical tests in the presence of the Engineer, unless otherwise directed, to demonstrate that the requirements for proof testing at the specified load are satisfied. The Contractor shall give the Engineer at least 7 days notice before beginning proof testing. Proof testing of PTFE bearings shall conform to the following requirements:

One bearing per lot of production PTFE bearings shall be proof tested. A lot is defined as 25 PTFE bearings or fraction thereof of the number of PTFE bearings shown on the contract plans.

Proof tests for compression: The bearing shall be held for one hour at 1.5 times the maximum vertical load shown on the plans for the bearing.

Proof tests for coefficient of friction: The tests shall be performed at the minimum dead load shown on the plans for the bearing with the test load applied for 12 hours prior to friction measurement and the following:

The tests shall be arranged to allow measurement of the static coefficient of friction on the first movement of the bearing.

The first movement static and dynamic coefficients of friction shall be measured at a sliding speed not exceeding one inch per minute and shall not exceed the specified coefficient of initial static friction.

The test bearings shall be subjected to a minimum of 100 movements of at least one inch of relative movement at a sliding speed not exceeding 12 inches per minute. After cycling, the first movement static and dynamic coefficients of friction shall be measured again at a sliding speed not exceeding one inch per minute and shall not exceed the specified coefficient of initial static friction.

The bearing surfaces shall be cleaned prior to testing.

Proof testing of bearings shall be done after conditioning specimens for 12 hours at 75°±5° F.

The proof tested bearings shall show no visible sign of: (1) bond failure of bearing surfaces, (2) separation or lift-off of plates from each other or from PTFE surfaces, or (3) other defects. When a proof tested bearing fails to comply with these specifications, all bearings in that lot shall be individually tested for acceptance.

Proof test results shall be certified correct and signed by the testing laboratory personnel who conducted the test and interpreted the test results. Proof test results shall include the bearing numbers of the bearings tested.

One sample of elastomeric bearing, 2.25±0.125 inches high and not less than 8 inches by 12 inches in plan, shall be cut by the manufacturer from one of the thickest production elastomeric bearings, as directed by the Engineer, and furnished to the Transportation Laboratory. The Contractor shall allow 3 weeks for testing and obtaining satisfactory results after sample bearing has been received.

A test specimen taken from the sample furnished to the Transportation Laboratory will be tested in accordance with California Test 663 for 10,000 cycles at the design load and 1/2 T (T = total thickness of elastomer) translation. The testing speed shall not exceed 4 1/2 inches per minute. Specimens tested shall show no indication of deterioration of elastomer or loss of bond between the elastomer and steel laminates.

PTFE bearing sole plates shall be temporarily supported during concrete placement. Temporary supports shall prevent the rotation or displacement of the bearings during concrete placing operations. Temporary supports shall not inhibit the functioning of the PTFE bearings after concrete is placed. Temporary supports shall not restrict the movement

at bridge joints due to temperature changes and shortening from prestress forces. Materials for temporary supports within the limits for placing concrete shall conform to the requirements for form fasteners.

PTFE and stainless steel surfaces shall be protected from contamination and weather damage.

Quantities of PTFE bearings will be determined as units from actual count in the completed work. A PTFE bearing with more than one disc shall be considered a single PTFE bearing.

The contract unit price paid for PTFE bearing shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in constructing the bearing, complete in place, including temporary supports, masonry plates, sole plates, proof testing, and cleaning and painting of PTFE bearings, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Full compensation for the sample of elastomeric bearing shall be considered as included in the contract unit price paid for PTFE bearing and no separate payment will be made therefor.

If a portion or all of PTFE bearings are tested at a site more than 300 air line miles from both Sacramento and Los Angeles, additional shop inspection expenses will be sustained by the State. Payment to the Contractor for PTFE bearings will be reduced $5,000 for each testing site located more than 300 air lines miles from both Sacramento and Los Angeles, or in the case of each testing site located more than 3,000 air line miles from both Sacramento and Los Angeles, payment will be reduced $8,000.

10-1.26 PTFE SPHERICAL BEARING

PTFE spherical bearings, consisting of polytetrafluoro-ethylene (PTFE) and stainless steel bearing surfaces, structural steel plates and anchors shall conform to the details shown on the plans and these special provisions.
PTFE spherical bearings shall be:

Expansion type with spherical and sliding bearing surfaces.

The manufacturer of the PTFE spherical bearings shall show evidence that PTFE spherical bearings furnished by the same manufacturer and used in conditions similar to this application have had at least 3 years of satisfactory service at each of 2 projects.

A qualified representative of the manufacturer shall be present during installation of the first bearing and shall be available for advice during any remaining installations.

The Contractor shall submit to the Engineer for approval in accordance with the provisions in Section 5-1.02, "Plans and Working Drawings," working drawings of the PTFE spherical bearings. For initial review, 4 sets of such drawings shall be submitted. After review, between 6 and 12 sets, as requested by the Engineer, shall be submitted to the said Office for final approval and for use during construction.

The working drawings for PTFE spherical bearings shall include a description of the method of mechanical interlocking of the PTFE fabric to the metallic substrate and details of temporary support for the PTFE bearing sole plate during concrete placement.

Working drawings shall be 22" x 34" or 11" x 17" in size and each drawing and calculation sheet shall include the name of the structure as shown on the contract plans, District-County-Route, bridge number, and contract number.

Working drawings shall be submitted sufficiently in advance of the start of the affected work to allow time for review by the Engineer and correction by the Contractor of the drawings without delaying the work. Such time shall be 6 weeks after complete drawings and all support data are submitted.

At the completion of each structure on the contract, one set of reduced prints on 20 pound (minimum) bond paper, 11 inches by 17 inches in size, of the corrected original tracings of all working drawings for each structure shall be furnished to the Engineer. Reduced prints of drawings which are common to more than one structure shall be submitted for each structure. An index prepared specifically for the drawings for each structure containing sheet numbers and titles shall be included on the first reduced print in the set for each structure. Reduced prints for each structure shall be arranged in the order of drawing numbers shown in the index.

The edge of the corrected original tracing image shall be clearly visible and visually parallel with the edges of the page. A clear, legible symbol shall be provided as near to the upper left side of each page as is feasible within the original print to show the amount of reduction and a horizontal and vertical scale shall be provided on each reduced print to facilitate enlargement to original scale.

PTFE spherical bearings shall be installed on surfaces prepared in accordance with the requirements of Section 55-3.19, "Bearings and Anchorages," of the Standard Specifications.

The manufacturer shall furnish certificates of compliance in accordance with Section 6-1.07, "Certificates of Compliance," of the Standard Specifications for all material used in the PTFE spherical bearings. The certification shall be supported by a copy of the results of all proof tests performed on the bearings.

PTFE surfaces of PTFE spherical bearings shall be unfilled PTFE fabric made from virgin PTFE oriented multifilament and other fibers. The resin in the filaments shall be virgin PTFE material (not reprocessed) meeting the requirements of ASTM Designation: D 1457.

At the highest point of substrate and after compression, the PTFE fabric shall have a minimum thickness of 1/16 inch and a maximum thickness of 1/8 inch.

Flat stainless steel surfaces shall be a weld overlay on structural steel plate, or solid or sheet stainless steel conforming to the requirements of ASTM Designation: A 240, Type 304 with a minimum thickness of 0.060 inch.

Curved stainless steel surfaces shall be solid stainless steel conforming to the requirements of ASTM Designation: A 240, Type 304.

Curved stainless steel surfaces with dimensions shown on the plans exceeding 4 inches in thickness shall be either a weld overlay on structural steel plate or solid stainless steel conforming to the requirements of ASTM Designation: A 240, Type 304. Stainless steel sheet will not be allowed.

When a weld overlay is used for stainless steel surfacing, the overlay shall be placed by submerged arc welding using Type 309L electrodes. The finished overlay shall have a 3/32 inch minimum thickness after welding, grinding and polishing. Prior to welding, the manufacturer must submit a complete weld procedure to the Engineer for approval.

When stainless steel sheets are used for flat stainless steel surfacing, the sheets shall be attached by perimeter arc welding using Type 309L electrodes. After completion of the weld operation, the stainless steel surface shall be smooth and free from waves.

Structural steel plates, except stainless steel, shall conform to the requirements of ASTM Designation: A 709, grade 36, 50, or 50W.

Welding shall conform to the requirements of ANSI/AASHTO/AWS D1.5.

Convex plate radius dimension tolerances shall be 0.000 to -0.010 inches. Concave plate radius dimension tolerances shall be +0.010 to 0.000 inches.

The bearing manufacturer shall have full size convex and concave metal templates for the two spherical surfaces of each bearing radius. The templates shall be available to the inspector during all bearing inspections.

The PTFE fabric on spherical or sliding bearing surfaces shall be epoxy bonded and mechanically interlocked to the steel substrate. All bonding shall be done under controlled factory conditions. The mechanical interlock on the spherical concave surface must be integrally machined into the steel substrate. Welded retention grids will not be allowed on the concave surface. Any edges, other than the selvage shall be oversown or recessed so that no cut fabric edges are exposed.

After completion of the bonding operation the PTFE surface shall be smooth and free from bubbles.

The surface of the bearing elements shall be controlled such that upon completion of the bearing assembly the PTFE to stainless steel interface shall be in full bearing.

The mating surface of the stainless steel with the PTFE surfacing shall have a polished surface finish of less than 20 micro inches root-mean-square (rms), determined according to ANSI Standard B46.1.

Metal surfaces of bearings exposed to the atmosphere, or in contact with structural steel or concrete in the completed work, except stainless steel surfaces, shall be cleaned and painted in accordance with the requirements in "Clean and Paint Structural Steel" of these special provisions.

PTFE spherical bearing assemblies shall be assembled at the factory. Each assembly shall have a minimum of four temporary steel straps which are bolted to threaded holes in the masonry and sole plates so that the entire assembly is shipped as a unit and remains intact when uncrated and installed. Welding of the steel straps will not be allowed. Straps must be adequate for vertical lifting purposes. Bearing dismantling will only be allowed under the direction and in the presence of the Engineer.

During fabrication, the maximum temperature of bonded PTFE surfaces shall be 300 °F.

Damaged bearings and bearings with scratched mating surfaces shall be replaced or resurfaced.

PTFE spherical bearing sole plates shall be temporarily supported during concrete placement. Temporary supports shall prevent the rotation or displacement of the bearing during concrete placing operations. Temporary supports shall not inhibit the functioning of the PTFE spherical bearing after concrete is placed. Temporary supports shall not restrict the movement at bridge joints due to temperature changes and shortening from prestress forces. Materials for temporary supports within the limits for placing concrete shall conform to the requirements for form fasteners.

An approved thread locking system, consisting of a cleaner, primer and anaerobic adhesive shall be applied where shown on the plans. Lubricants and foreign materials shall be removed from the threaded areas of both parts using the cleaner and small wire brush. The primer shall be applied to cover the threaded areas of both parts. The anaerobic adhesive shall be applied to fill the male threads in the area of the final position of the nut. The nut shall be installed at

the location or to the torque shown on the plans, and an additional fillet of anaerobic adhesive shall be applied completely around the exposed junctions of the nut and male part.

PTFE spherical bearings shall have a first movement static coefficient of friction not exceeding 0.06.

Prior to proof testing, all bearings shall be permanently die-stamped on 2 of 4 sides with markings consisting of bearing number and contract number. Each bearing shall have a unique bearing number and match marks on plate edges to insure correct assembly at the job site.

Full sized PTFE spherical bearings shall be proof tested and evaluated for compression and coefficient of friction in the presence of the Engineer, unless otherwise directed. The proof tests shall be performed on samples randomly selected by the Engineer from the production bearings to be used in the work. Proof testing shall be performed by the Contractor at the manufacturer's plant or at an approved laboratory. If proof tests are not performed at the specified load, the Contractor shall perform additional physical tests in the presence of the Engineer, unless otherwise directed, to demonstrate that the requirements for proof testing at the specified load are satisfied. The Contractor shall give the Engineer at least 7 days notice before beginning proof testing. Proof testing of PTFE spherical bearings shall conform to the following requirements:

One bearing per lot of production bearings shall be proof tested. A lot is defined as 25 bearings or fraction thereof of the same type, within a load category.

The bearing types and proof tests required for each type shall be as follows:

1. Fixed type bearings shall be proof tested for compression.
2. Expansion type bearings shall be proof tested for compression and coefficient of friction.

A load category shall consist of bearings of differing vertical load capacity within a range defined as follows:

1. Bearings with less than or equal to 500 kips maximum vertical load capacity.
2. Bearings with greater than 500 kips but less than or equal to 2000 kips maximum vertical load capacity.
3. Bearings with more than 2000 kips maximum vertical load capacity.

Proof tests for compression: The bearing shall be held at the design rotation or 0.02 radians whichever is greater for one hour at 1.5 times the maximum vertical load shown on the plans for the bearing. The device shall be in a rotated position during the test. The rotation may be imposed on the bearing by inserting a beveled plate between the bearing and the restraining surface prior to loading.

Proof tests for coefficient of friction: The tests shall be performed at the maximum vertical load shown on the plans for the bearing with the test load applied for 12 hours prior to friction measurement and the following:

The tests shall be arranged to allow measurement of the static coefficient of friction on the first movement of the bearing.

The first movement static and dynamic coefficients of friction shall be measured at a sliding speed not exceeding one inch per minute and shall not exceed the specified coefficient of initial static friction.

The test bearings shall be subjected to a minimum of 100 movements of at least one inch of relative movement at a sliding speed not exceeding 12 inches per minute. After cycling, the first movement static and dynamic coefficients of friction shall be measured again at a sliding speed not exceeding one inch per minute and shall not exceed the specified coefficient of initial static friction.

The bearing surfaces shall be cleaned prior to testing.

Proof testing of bearings shall be done after conditioning specimens for 12 hours at 70°±15° F.

The proof tested bearings shall show no visible sign of: (1) bond failure of bearing surfaces, (2) separation or lift-off of plates from each other or from PTFE surfaces, or (3) other defects. When a proof tested bearing fails to comply with these specifications, all bearings in that lot shall be individually tested for acceptance.

Proof test results shall be certified correct and signed by the testing laboratory personnel who conducted the test and interpreted the test results. Proof test results shall include the bearing numbers of the bearings tested.

Quantities of PTFE spherical bearings will be determined as units from actual count in the completed work. A PTFE spherical bearing with more than one PTFE surface shall be considered a single PTFE spherical bearing.

The contract unit price paid for PTFE spherical bearing shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in constructing the bearing, complete in

place, including masonry and sole plates, anchor bolts and sleeves, shoe plate, bearing stop bar, headed anchors, bearing clip, anaerobic adhesive, mortaring of bolts, modifications to the existing shoe base plate, temporary supports, proof testing, and cleaning and painting of PTFE spherical bearings, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

If a portion or all of PTFE spherical bearings are tested at a site more than 300 air line miles from both Sacramento and Los Angeles, additional shop inspection expenses will be sustained by the State. Payment to the Contractor for furnishing PTFE spherical bearings will be reduced $5,000 for each testing site located more than 300 air lines miles from both Sacramento and Los Angeles.

10-1.27 DRILL AND BOND DOWELS

Drilling and bonding dowels shall conform to the details shown on the plans, the provisions in Section 83-2.02D(1), "General," of the Standard Specifications and these special provisions.

Epoxy-coated reinforcing steel dowels shall conform to the provisions for bar reinforcement in "Epoxy-Coated Reinforcement" of these special provisions.

If reinforcement is encountered during drilling, before specified depth is attained, the Engineer shall be notified. Unless the Engineer approves coring through the reinforcement, the hole will be rejected and a new hole, in which reinforcement is not encountered, shall be drilled adjacent to the rejected hole to the depth shown on the plans.

Unless otherwise provided, dowels to be bonded into drilled holes will be paid for as bar reinforcing steel (epoxy-coated) (bridge).

Unless otherwise provided, drilling and bonding dowels will be measured and paid for by the linear foot determined by the number and the required depth of holes as shown on the plans, or as ordered by the Engineer.

The contract price paid per linear foot for drill and bond dowel shall include full compensation for furnishing all labor, materials (except reinforcing steel dowels), tools, equipment, and incidentals, and for doing all the work involved in drilling the holes, coring through reinforcement when approved by the Engineer, and bonding the dowels, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

10-1.28 CORE CONCRETE

Coring concrete shall consist of coring holes through concrete bridge members as shown on the plans and in conformance with the requirements in these special provisions.

For cored holes greater than 10 feet in length, the following shall apply:

Prior to coring, the Contractor shall submit, in accordance with Section 5-1.02, "Plans and Working Drawings," of the Standard Specifications, the methods and equipment to be used in the coring operations.

The deviation in alignment of cored holes from that shown on the plans shall not be more than 1/2 inch per 10 feet of cored hole length with a maximum deviation of not more than 3 inches.

Difficult coring is anticipated due to the presence of vertical reinforcement.

The holes shall be cored by methods that will not shatter or damage the concrete adjacent to the holes.

Water for core drilling operations shall be from the local domestic water supply or shall not contain more than 1,000 parts per million of chlorides as Cl, nor more than 1,300 parts per million of sulfates as SO_4, nor shall it contain any impurities in a sufficient amount to cause discoloration of the concrete or produce etching of the surface.

Water from core drilling operations shall not be permitted to fall into the bay, or on public traffic, to flow across shoulders or lanes occupied by public traffic, or to flow into gutters or other drainage facilities.

10-1.29 CORE AND BOND DOWEL (EPOXY CARTRIDGE)

Coring and bonding dowels with epoxy cartridges shall conform to the details shown on the plans and the requirements in these special provisions.

Threaded rods used as dowels shall conform to the provisions in Section 75-1.03, "Miscellaneous Bridge Metal," of the Standard Specifications,. The threaded rods shall be installed in accordance with these requirements for dowels specified herein.

The Contractor shall select an epoxy cartridge system which has passed the testing requirements of the current edition of the International Conference of Building Officials (ICBO) document - AC58 and additional test requirements as specified in the current edition of the Caltrans Augmentation/Revisions to ICBO AC58. All testing shall be directly performed or verified by an independent testing facility and the results will be reviewed and approved by the Office of

Materials and Foundations. The Caltrans Augmentation/Revisions to ICBO AC58 document may be obtained by contacting the Office of Materials and Foundations, telephone: (916) 227-7000.

The epoxy cartridge system used shall be appropriate for the ambient concrete temperature and installation conditions at the time of installation in accordance with the data and conditions as listed in the current version of the ICBO evaluation report, and any conditions or restrictions contained in the manufacturer's specifications.

Epoxy cartridges shall be accompanied by a Certificate of Compliance as provided in Section 6-1.07, "Certificates of Compliance," of the Standard Specifications. The certificate shall state that the material complies in all respects to the requirements of ICBO AC58 and Caltrans Augmentation/Revisions to ICBO AC58.

The packaging for each epoxy cartridge shall be clearly and permanently marked with the manufacturer's name, model number of the epoxy cartridge system, manufacturing date, lot number, shelf life or expiration date, current ICBO ER number, and instructions for installation. Each carton of epoxy cartridges shall contain a warning or precautions concerning the contents as may be required by State or Federal Laws and Regulations.

For cored holes greater than 10 feet in length, the following shall apply:

Prior to coring, the Contractor shall submit, in accordance with Section 5-10.2, "Plans and Working Drawings," of the Standard Specifications, the methods and equipment to be used in the coring operations.

The deviation in alignment of cored holes from that shown on the plans shall not be more than 1/2 inch per 10 feet of cored hole length with a maximum deviation of not more than 3 inches.

The holes shall be cored by methods that will not shatter or damage the concrete adjacent to the holes.

Water for coring operations shall be from the local domestic water supply or shall not contain more than 1,000 parts per million of chlorides as Cl, nor more than 1,300 parts per million of sulfates as SO_4, nor shall it contain any impurities in a sufficient amount to cause discoloration of the concrete or produce etching of the surface.

Water from coring operations shall not be permitted to fall into the bay, or on public traffic, to flow across shoulders or lanes occupied by public traffic, or to flow into gutters or other drainage facilities.

Difficult coring is anticipated due to the presence of vertical reinforcement.

The cored holes shall be cleaned in accordance with the manufacturer's instructions and shall be dry at the time of placing the epoxy cartridge bonding material and the steel dowels. The bonding material shall be a two-component epoxy system contained in a cartridge having two separate chambers and shall be inserted into the hole using a dispensing gun and replaceable mixing nozzle approved by the manufacturer.Unless otherwise specified, the depth of hole and the installation procedure shall be specified as recommended by the manufacturer. The depth of hole for 1 1/4 inch nominal diameter dowels shall be not less than 24 inches.

Prior to installation, the Contractor shall submit to the Engineer for approval the methods and equipment to be used to test the bond strength of the bonding material in accordance with Section 5-1.02, "Working Drawings," of the Standard Specifications. Core and bond (epoxy cartridge) dowels shall have a bond strength not less than 120 kips. A copy of the manufacturer's recommended installation procedure shall be provided to the Engineer at least 7 days prior to the start of work.

Immediately after inserting the dowels into the epoxy, the dowels shall be supported as necessary to prevent movement during curing and shall remain undisturbed until the epoxy has cured a minimum time as specified by the manufacturer. Dowels that are improperly bonded, as determined by the Engineer, will be rejected. Adjacent new holes shall be cored , and new dowels shall be placed and securely bonded to the concrete. All work necessary to correct improperly bonded dowels shall be performed at the Contractor's expense.

Unless otherwise provided, dowels to be bonded into cored holes will be measured and paid for as miscellaneous metal (bridge).

Unless otherwise provided, coring and bonding dowels with epoxy cartridges will be measured and paid for by the unit as core and bond dowel (epoxy cartridge). The number of units to be paid for will be determined from actual count of the completed units in place.

The contract unit price paid for core and bond dowel (epoxy cartridge) shall include full compensation for furnishing all labor, materials (except dowels), tools, equipment and incidentals, and for doing all work involved in coring the holes and bonding dowels with epoxy cartridges, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

10-1.30 CORE AND PRESSURE GROUT DOWELS

Coring and pressure grouting dowels shall consist of coring holes through concrete, placing dowels, and filling the holes with pressurized grout, as shown on the plans and in conformance with the requirements in these special provisions.

Dowels to be placed in the cored holes shall conform to the provisions for high strength threaded rods in "Miscellaneous Metal (Bridge)" elsewhere in these special provisions.

Dowels to be pressure grouted in cored holes will be paid for as miscellaneous metal (bridge).

The holes shall be cored by methods that will not shatter or damage the concrete adjacent to the holes.

For cored holes greater than 10 feet in length, the following shall apply:

Prior to coring, the Contractor shall submit, in accordance with Section 5-10.2, "Plans and Working Drawings," of the Standard Specifications, the methods and equipment to be used in the coring operations.

The deviation in alignment of cored holes from that shown on the plans shall not be more than 1/2 inch per 10 feet of cored hole length with a maximum deviation of not more than 3 inches.

Water for core drilling operations shall be from the local domestic water supply or shall not contain more than 1,000 parts per million of chlorides as Cl, nor more than 1,300 parts per million of sulfates as SO_4, nor shall it contain any impurities in a sufficient amount to cause discoloration of the concrete or produce etching of the surface.

Concrete areas and steel surfaces to be in contact with the grout shall be cleaned of all loose or foreign material that would in any way prevent bonding, and concrete holes shall be flushed with water and allowed to dry to a surface dry condition immediately prior to grouting.

Grout shall conform to the requirements of either ASTM Designation: C 1107, Grade B, or ASTM Designation: C 845, Type K, and shall provide a minimum compressive strength of 5000 pounds per square inch at 28 days when tested by California Test 551. The grout shall be mixed in accordance with the manufacturer's recommendations. Water shall comply with the provisions for water for prestressed concrete work as specified in Section 90-2.03, "Water," of the Standard Specifications.

Admixtures shall not contain more than 500 parts per million of chlorides as Cl, when tested by California Test 422, and shall not contain more than 2000 parts per million of sulfates as SO_4, when tested by California Test 417.

After dowel placement, the ends of the cored hole containing the dowel shall be sealed. A vent tube shall be placed at one end and one injection feed tube at the other end. The vent tube and injection feed tube shall be placed in the same end for cored holes that have only one end. The tubes shall be placed in the hole in a manner which will allow the air to vent and the hole to be completely filled with grout. Sufficient pressure shall be achieved to ensure that the hole is free of voids. Grout shall be pumped into the holes and continually wasted until no visible slugs or other visible evidence of water or air are ejected.

Grout or water shall not be permitted to flow into any waterway, on to public traffic, across shoulders or lanes occupied by public traffic, or into gutters or other drainage facilities.

Coring and pressure grouting dowels will be measured and paid for by the linear foot. The cored concrete will be measured along the centerline of the hole.

The contract price paid per linear foot for core concrete and pressure grout shall include full compensation for furnishing all labor, materials, except dowels, tools, equipment, and incidentals, and for doing all work involved in coring the holes, and pressure grouting the holes, including control of water from core drilling, as shown on the plans, as specified in these special provisions, and as directed by the Engineer.

10-1.31 VISCOUS DAMPERS

Viscous dampers, consisting of a metal housed piston and piston head assembly filled with silicone fluid, shall conform to the details shown on the plans, to the provisions in Section 55, "Steel Structures," of the Standard Specifications and these special provisions.

The viscous damper manufacturer shall have successfully completed the pre-qualification testing program prior to advertisement of this contract. The pre-qualification testing program shall have been performed in accordance with "A Test Plan for the Characterization and Qualification of Highway Bridge Isolator and Damping Devices," dated February 23, 1995, by the California Department of Transportation, and shall have been performed under the supervision of an Engineer from the Department of Transportation at a facility approved by the Department of Transportation.

A list of viscous damper manufacturers that have been pre-qualified and the document "A Test Plan for the Characterization and Qualification of Highway Bridge Isolator and Damping Devices," may be obtained from the Toll Bridge Retrofit Program Duty Senior at District 04 Office, Tel: (510) 286-5549, Fax: (510) 286-4563.

The viscous dampers shall be designed for the loading conditions, displacements, and criteria shown on the plans. The viscous damper design shall be confirmed by the certified prototype test results for the dampers. In addition, if the plans or these special provisions indicate limiting parameters for a damper, the damper shall conform to those parameters.

Damper test results shall display a first cycle peak resisting force within the envelope as shown on the plans during prototype testing. All devices of similar make shall display dynamic characteristics within 5% of each other for both the prototype and proof devices. The peak force from the fifth cycle shall not drop more than 20% from the peak force of the first cycle.

Dampers shall be supplied complete with the spherical joints, pins and spacers needed to connect them to the damper brackets as shown on the plans. Design and fabrication of the spherical joints and pins shall be in accordance with the requirements of these special provision. Pins shall be supplied complete with any ancillary hardware needed to permanently secure them in place.

No viscous damper shall be installed until the Engineer has reviewed and approved, in writing, the working drawings, the prototype testing and the proof testing for the viscous damper system to be used.

Prototype dampers shall remain at the designated testing facility until approved for delivery to the field by the Engineer. The dampers shall then be hauled to the anchorage at Pier W4 and stockpiled. The Contractor shall notify the Engineer not less than 4 working days before any material is to be hauled to the anchorage at Pier W4.

Testing brackets shall remain at SRMD testing facility and be considered property of the State after all testing has been completed.

WORKING DRAWINGS.--The Contractor shall submit complete working drawings for the viscous dampers to the Engineer in accordance with the provisions in Section 5-1.02, "Plans and Working Drawings," of the Standard Specifications. For initial review, 6 sets of drawings shall be submitted. After review, between 6 and 12 sets, as requested by the Engineer, shall be submitted to said Office for final approval and use during construction.

Working drawings shall be either 11" x 17" or 22" x 34" in size and each drawing and calculation sheet shall include 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. The manufacturer's 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 working drawings shall contain all information required for the proper construction of the viscous dampers. The working drawings shall be supplemented with a fabrication quality control program, detailed descriptions of the prototype and proof test programs, an installation manual, inspection and maintenance manuals, and a certified copy of the results of all tests performed on the viscous dampers and materials. The working drawings shall be supplemented with calculations for the viscous damper design for the particular installation. The working drawings shall include a list of all of the materials and components to be used in the viscous dampers. The working drawings shall include a complete list of all ASTM or other standards that shall be adhered to in the fabrication of the viscous dampers. The working drawings shall list the components that will be permanently deformed, if any, during prototype or proof testing with calculations showing the anticipated stress in the components at each increment of the maximum lateral force or maximum lateral displacement. The working drawings shall include design calculations for the testing brackets and locations for the thermal couplers. Each working drawing or calculation sheet shall be signed by an engineer who is registered as either a Civil Engineer or a Mechanical Engineer in the State of California.

The working drawings and supplements shall be submitted in three parts. The Contractor shall allow 4 weeks following the submittal of part 1 for the Engineer's review of the working drawings and supplements. The Contractor shall not start the fabrication of prototype test specimens until the Engineer has reviewed and approved the submittal of part 1. The Contractor shall allow 3 weeks for prototype testing for each viscous damper type shown on the plans. The Contractor shall allow 3 weeks following the submittal of part 2 for the Engineers review of the prototype test results. The Contractor shall allow 6 weeks following the submittal of part 3 for the Engineers review. The Contractor shall not start proof testing until the Engineer has reviewed and approved the submittal, in writing, of part 2 and part 3. The Contractor shall allow 1 day for proof damper testing for each viscous damper. The working drawings and supplements shall be submitted within the following time limits:

ITEMS	TIME LIMIT
PART 1: Working drawings, calculations, materials and components list, working drawings and design calculations for testing brackets, quality control program, and detailed descriptions of the prototype tests .	Within 12 weeks after contract approval.
PART 2: Certified copy of the results of all prototype tests.	Within 28 weeks following approval of the viscous dampers working drawings .
PART 3: Final working drawings, calculations, materials and components list, quality control program, location of test facility, detailed descriptions of the proof damper test program, installation manual, and inspection and maintenance manual.	

Within 9 weeks after final working drawing approval, one set of the corrected good quality prints on 60 pound (minimum) bond paper (22" x 34" in size) and electronic files of all working drawings prepared by the Contractor for the viscous dampers shall be furnished to the Engineer. The electronic files shall be Microstation Version 5.0 or later design file format on compact disk media.

Each shipment of viscous dampers shall be accompanied by a Certificate of Compliance in accordance with the provisions of Section 6-1.07, "Certificates of Compliance," of the Standard Specifications. The certificate shall certify that the viscous dampers conform to the pre-qualified design and material requirements, and were manufactured in accordance with the approved quality control program. The certification shall be supported by a copy of the results of all prototype and proof (production) tests performed on the dampers and damper materials.

Tests results shall be certified correct and signed by the testing laboratory personnel who conducted the tests.

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

MATERIALS.—All materials and processes used in the manufacturing of the viscous dampers shall be identified in the working drawings by specifications or standards.

Dissimilar materials as defined in MIL-STD-889B shall not be used in contact with each other, without protection against electrolytic corrosion. Dissimilar metal joints shall not be used without a non-metallic separator or gasket of at least .06 inch thickness. The use of aluminum, aluminum alloys, magnesium, magnesium alloys, beryllium and beryllium alloys will not be allowed. The use of non-stainless steel exposed to the silicon fluid (such as that which could occur in an internal reservoir, and plumbing to the reservoir) will not be permitted.

Castings used for pressure vessel parts not subject to tensile or bending stresses, such as covers, handles, and similar items, whose failure would not affect the structural integrity or performance characteristics of the unit, shall conform to the provisions ASTM Designation: A 27, Class 2. Castings used for pressure vessel parts subjected to tensile or bending stresses shall conform to the provisions in ASTM Designation: A 747.

All damper components shall be of non-age-sensitive materials.

Pins, spaces, pin restrainers and spherical bearings shall be fabricated from stainless steel, and the spherical bearings may be of the lined type with non-metallic liners.

Piston rods and any part that slides relative to a seal shall be manufactured from stainless steel. Plating may be applied over the stainless steel if required by the type of fluid seal selected as approved by the Engineer.

Operating fluid used in the dampers shall be a non-toxic, non-flammable, and cosmetically inert silicone in accordance with the provisions in Federal Specification: VV-D-1078 (B). Petro-chemical fluids shall not be used.

The components of the damper that are pressure vessels shall be of non-tie rod type construction, without externally supported heads or end caps. Welded construction or castings of any type shall not be permitted for pressure vessel construction.

Pressure vessels and seals shall be rated for a minimum burst pressure of 150% of the maximum dynamic operating pressure. Calculations for the minimum burst pressure shall be included in the Part 1 working drawings.

The manufacturer shall establish and maintain a manufacturing/processing control system including written process specifications and procedures, in accordance with Section 6-1.01, "Source of Supply and Quality of Materials," of the Standard Specifications and these special provisions and one of the following:

Control of Quality MIL-Q-9858A: The seller shall provide and maintain a system that complies with Military Specification: MIL-Q-9858A, "Quality Program Requirements."

Control of Quality MIL-I-45208A: The seller shall provide and maintain a system that complies with Military Specification: MIL-I-45208A, "Inspection System Requirements."

Control of Quality ISO 9001: The seller shall provide and maintain a system that complies with United States requirements of the International Standard Organization (ISO) 9001 model for quality assurance in design, development, production, installation and servicing. Certification to ISO 9001 by an individual or firm located outside the United States of America is prohibited.

All manufacturing techniques and materials used for prototype and production dampers shall be the same as those used for the pre-qualification tests.

All welding shall be in accordance with AWS D 1.1.

The brazing of steels, copper, copper alloys and nickel alloys shall conform to Military Specification: MIL-B-7883B.

The exterior finish of the unit, including the color and finish type required shall be recommended by the manufacturer and submitted to the Engineer for approval.

The dampers shall be designed with a minimum factor of safety of 1.5 times for design loads and yield of materials, and shall withstand a minimum lateral center load of 2.0 times the self weight of the damper in its maximum elongated position.

Components exposed to the atmosphere shall be protected against corrosion and the piston rod shall be protected from dust.

The viscous dampers shall be constructed to be maintenance free over a period of at least 10 years and a service life of a minimum of 30 years. Inspection requirements and procedures shall be provided by the manufacturer and shall be approved by the Engineer. The damper shall be supplied with a 5 year warranty for all parts.

The viscous dampers shall be designed and constructed so that installation, removal, or replacement, if necessary, shall be a simple process not requiring any special tools or methods.

All damper connections shall be designed to accommodate a minimum 5 degree transverse rotation without damage to the device.

The unit shall be capable of operating at the design levels for the environmental conditions, without degradation of performance as a result of maximum/minimum operating temperature.

The unit shall be designed to allow a dynamic leakage level that will have no effect on performance over the useful life of the damper. This leakage shall be quantified in a way that is easily measurable. Under non-seismic conditions, static seals shall not leak externally.

When installed, the unit shall be capable of operating in an ambient air temperature range of 20° F to 110° F.

The unit shall be designed to withstand relative humidity up to 100 percent, including condensation due to temperature change.

Installation Manual.--The Contractor shall submit 6 installation manuals for the dampers for review and approval by the Engineer prior to installation of the dampers. The installation manual shall include the following:

1. The method of installation of the dampers including installation sequence and setting diagram.
2. The method of adjustment of the dampers for temperature change as shown on the plans, and for errors in the positioning of the damper brackets.
3. Temporary and permanent attachment of the dampers to the bridge; including the installation and securing in place of the pins connecting the dampers to the damper brackets shown on the plans.
4. Requirements for storage of the dampers and details of temporary support of the dampers for shipping and handling.

Inspection and Maintenance Manual.--The Contractor shall submit 6 inspection and maintenance manuals for the dampers for review and approval by the Engineer prior to completion of the project. The inspection and maintenance manual shall include the following:

1. Inspection requirements for the dampers, including the method and recommended frequency of inspection. The manual shall include the specific observations to be made, and the acceptable range of values.

2. Maintenance requirements for the dampers, including the method and recommended frequency of maintenance.

3. Contact and telephone number for maintenance questions.

TESTING.—Viscous dampers shall be prototype and proof tested to verify compliance with the physical parameters and energy requirements shown on the plans. Testing shall be performed at the "Seismic Response Modification Device Test System (SRMD)" on the University of California, San Diego campus, telephone (619) 822-3029. The ambient temperature of the testing facility and the test article shall be 70 degrees F. ± 20 degrees at the start of the test.

The temperature of the dampers shall be monitored continuously for all tests. The dampers shall be monitored at a minimum of two locations which best represent the internal fluid temperature. Monitoring shall begin a minimum of 5 minutes prior to testing and shall continue a minimum of 15 minutes after testing. The location of the thermal couplers shall be recommended by the manufacturer.

The Contractor shall notify the SRMD testing facility and the Engineer, in writing, at least 21 days prior to the shipment of each type of viscous damper for testing. Prototype and proof testing of the viscous dampers shall be coordinated with the SRMD testing facility. Tests shall be performed in the presence of the Engineer.

Detailed drawings of the testing facility can be obtained from the SRMD testing facility for test bracket design. Testing brackets shall be delivered with the first dampers to be prototype tested.

The hysteretic behavior of the specimens for the prototype and proof tests shall remain stable and the specimens shall show no signs of distress at all loading conditions.

Prototype Tests.--For each viscous damper type shown on the plans, two full scale prototype dampers shall be manufactured and tested in accordance with these special provisions. All devices shall be tested over the full design stroke range to verify stroke capacity.

All tests shall be performed at the same test facility.

Viscous damper output shall be symmetrical in both compression and tension.

Viscous damper output shall not be sensitive to the initial position of the rod stroke position.

Viscous damper output shall be consistent between two units of the same type.

For each damper type, dynamic tests shall be performed in accordance with the following table:

Damper Type	Tests
Type A	5 continuous fully reversed sinusoidal cycles with +/- 18 inch stroke at 0.6 Hz, 0.4 Hz,, 0.2 Hz, 0.1 Hz
Type B	5 continuous fully reversed sinusoidal cycles with +/- 6 inch stroke at 0.4 Hz, 0.3 Hz, 0.2 Hz, 0.1 Hz
Type C	5 continuous fully reversed sinusoidal cycles with +/- 22 inch stroke at 0.5 Hz, 0.3 Hz,, 0.2 Hz, 0.1 Hz

All prototype dampers shall be tested for wind loads with +/- 2 inch stroke at 0.20 Hz for 200 sinusoidal cycles. Tests may be terminated when the temperature of the damper has reached the manufacturer's maximum recommended temperature and the device will be rejected.

Prototype viscous damper test data for each production viscous damper type shall be submitted within seven calendar days after the completion of testing.

Prototype viscous dampers may be used for installation as approved by the Engineer.

Proof Tests.--All viscous dampers to be placed in the structure shall be proof tested. The proof tests shall verify the capacity of each damper. Acceptance of the damper is contingent upon the tests results. All dampers shall be tested over the full design stroke range to verify the stroke capacity.

Proof pressure tests shall be performed on each viscous damper and performed by the manufacturer prior to shipment to SRMD. The proof pressure test shall consist of applying an internal pressure, equivalent to 125% of the pressure associated with the maximum dynamic axial capacity of the damper, as shown on the plans. The internal pressure shall be maintained for 120 seconds without a drop in pressure.

The proof dynamic tests shall be performed for each viscous damper to be installed in the structure in accordance with the following table:

Damper Type	Tests
Type A	5 continuous fully reversed sinusoidal cycles with +/- 18 inch stroke at 0.2 Hz
Type B	5 continuous fully reversed sinusoidal cycles with +/- 6 inch stroke at 0.2 Hz
Type C	5 continuous fully reversed sinusoidal cycles with +/- 22 inch stroke at 0.2 Hz

All dampers of the same type shall display hysteretic behavior within 5% of each other and within 5% of the prototype hysteretic behavior.

Proof test data shall be submitted to the Engineer within 7 calendar days after the completion of production proof testing. The contractor shall allow 3 weeks following the submittal of the proof test data for the Engineers review and approval.

MEASUREMENT AND PAYMENT.--The quantity of viscous dampers will be determined as units from the actual count of the dampers in the completed work and the dampers stockpiled at Pier W4.

The contract unit price paid for viscous dampers of the types listed in the Engineer's Estimate shall include full compensation for furnishing all labor, materials (including prototype dampers used for testing), tools, equipment and incidentals and for doing all the work involved in designing, shipping to and from the testing facility, testing brackets, fabricating, and constructing the viscous dampers with connection components, including pins, spacers, pin restrainers and spherical bearings, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

No payment will be made for viscous dampers which fail to meet any of the acceptance criteria.

Payment to the Contractor for viscous dampers will be reduced by $5,400 for each prototype re-test and $1,800 for each proof re-test.

If a portion or all of viscous dampers are fabricated at a site more than 300 air line miles from both Sacramento and Los Angeles, additional shop inspection expenses will be sustained by the State. Payment to the Contractor for viscous dampers will be reduced $5,000 for each fabrication site located more than 300 air lines miles from both Sacramento and Los Angeles.

Full compensation for the damper retesting shall be considered as included in the contract price paid per unit for viscous dampers and no additional compensation will be allowed therefor.

10-1.32 REINFORCEMENT

Reinforcement shall conform to the provisions in Section 52, "Reinforcement," of the Standard Specifications and these special provisions.

Attention is directed to "Welding Quality Control" elsewhere in these special provisions.

The first paragraph of Section 52-1.02A, "Bar Reinforcement," of the Standard Specifications is amended as follows:

Reinforcing bars shall be low-alloy steel deformed bars conforming to the specifications of ASTM Designation: A 706/A 706M, except that deformed or plain billet-steel bars conforming to the requirements in ASTM Designation: A 615/A 615M, Grade 40 or 60, may be used as reinforcement in the following:

1. Slope and channel paving;
2. Minor structures;
3. Sign and signal foundations (pile and spread footing types);
4. Roadside rest facilities; and
5. Concrete barrier Type 50 and Type 60 series and temporary railing.

Deformations specified in ASTM Designation: A 706/A 706M will not be required on bars used as spiral or hoop reinforcement in structures and concrete piles.

Section 52-1.02C, "Welded Wire Fabric," of the Standard Specifications is amended to read:

52-1.02C Welded Wire Fabric.—Welded wire fabric shall be either plain or deformed conforming to the requirements in ASTM Designation: A 185 or ASTM Designation: A 497, respectively.

Section 52-1.02D, "Reinforcing Wires and Plain Bars," of the Standard Specifications is amended to read:

52-1.02D Reinforcing Wire.—Wire used as reinforcement in structures and concrete piles, as shown on the plans, shall be cold drawn steel wire conforming to the specifications of ASTM Designation: A 82.

The last paragraph of Section 52-1.07, "Placing," of the Standard Specifications is amended to read:

Whenever a portion of an assemblage of bar reinforcing steel that is not encased in concrete exceeds 20 feet in height, the Contractor shall submit to the Engineer for approval, in accordance with the provisions in Section 5-1.02, "Plans and Working Drawings," working drawings and design calculations for the temporary support system to be used. The working drawings and design calculations shall be signed by an engineer who is registered as a Civil Engineer in the State of California. The temporary support system shall be designed to resist all expected loads and shall be adequate to prevent collapse or overturning of the assemblage. If the installation of forms or other work requires revisions to or temporary release of any portion of the temporary support system, the working drawings shall show the support system to be used during each phase of construction. The minimum horizontal wind load to be applied to the bar reinforcing steel assemblage, or to a combined assemblage of reinforcing steel and forms, shall be not less than 20 pounds per square foot on the gross projected area of the assemblage.

The sixth paragraph of Section 52-1.08, “Splicing,” of the Standard Specifications is amended to read:

Except when otherwise specified, mechanical lap splicing shall conform to the details shown on the plans, the requirements for mechanical butt splices as specified in this Section 52-1.08, and Sections 52-1.08C, “Mechanical Butt Splices,” 52-1.08D, “Qualification of Welding and Mechanical Splicing,” and 52-1.08E, “Job Control Tests,” and the following:

The mechanical lap splice shall be a unit consisting of a sleeve, in which the reinforcing bars are positioned, and a wedge driven through holes in the sleeve and between the reinforcing bars. The mechanical lap splice shall only be used for splicing non-epoxy-coated deformed reinforcing bars Nos. 4, 5 and 6. One mechanical lap splice unit per splice shall be used.

The eighth and ninth paragraphs of Section 52-1.08, "Splicing," of the Standard Specifications are amended to read:

Unless otherwise shown on the plans or approved by the Engineer, splices in adjacent reinforcing bars at any particular section shall be staggered. The minimum distance between staggered lap splices or mechanical lap splices shall be the same length required for a lapped splice in the largest bar. The minimum distance between staggered butt splices shall be 2 feet. All distances shall be measured between the midpoints of the splices along a line which is centered between the axes of the adjacent bars.

Completed butt splices shall develop a minimum tensile strength, based on the nominal bar area, of 63,000 psi for ASTM Designation: A 615/A 615M Grade 40 bars, and of 80,000 psi for ASTM Designation: A 615/A 615M Grade 60 and ASTM Designation: A 706/A 706M bars. If butt splices are made between two bars of dissimilar strengths, the minimum required tensile strength for the splice shall be that required for the weaker bar.

The second sentence of the eleventh paragraph of Section 52-1.08, "Splicing," of the Standard Specifications is amended to read:

Job control tests shall be made on sample splices representing each lot of mechanical butt splices as provided in Section 52-1.08E, “Job Control Tests.”

Section 52-1.08B, "Butt Welded Splices," of the Standard Specifications is replaced with the following:

52-1.08B Butt Welded Splices.— All butt welded splices in reinforcing bars shall be complete joint penetration butt welds conforming to the requirements in AWS D1.4, and the requirements of these specifications and the special provisions. At the option of the Contractor, shop produced resistance butt welds that are produced by a fabricator who is approved by the Transportation Laboratory may be used. These welds shall conform to the requirements of these specifications and special provisions.

Only the joint details and dimensions as shown in Figure 3.2, "Direct Butt Joints," of AWS D1.4-92, shall be used for making complete joint penetration butt welds of bar reinforcement. Split pipe backing shall not be used.

Material used as backing for complete joint penetration butt welds of bar reinforcement shall be a flat plate conforming to the requirements of ASTM Designation: A 709, Grade 36. The flat plate shall be 0.25-inch thick with a width, as measured perpendicular to the axis of the bar, equal to the nominal diameter of the bar, and a length which does not exceed twice the nominal diameter of the bar. The flat plate backing shall be fitted tightly to the bar with the root of the weld centered on the plate. Any bar deformation or obstruction preventing a tight fit shall be ground smooth and flush with the adjacent surface. Tack welds used to fit backing plates shall be within the weld root area so that they are completely consumed by the finished weld. Backing plates shall not be removed.

Butt welds shall be made with multiple weld passes using a stringer bead without an appreciable weaving motion. The maximum stringer bead width shall be 2.5 times the diameter of the electrode and slagging shall be performed between each weld pass. Weld reinforcement shall not exceed 1/8-inch in convexity.

Before any electrodes or flux-electrode combinations are used, the Contractor, at the Contractor's expense, shall furnish certified copies of test reports for all the pertinent tests specified in AWS A5.1, AWS A5.5, AWS A5.18 or AWS A5.20, whichever is applicable, made on electrodes or flux-electrode combinations of the same class, brand and nearest specified size as the electrodes to be used. The tests may have been made for process qualification or quality control, and shall have been made within one year prior to manufacture of the electrodes and fluxes to be used. The report shall include the manufacturer's certification that the process and material requirements were the same for manufacturing the tested electrodes and the electrodes to be used. The forms and certificates shall be as directed by the Engineer.

Electrodes for manual shielded metal arc welding of ASTM Designation: A 615/A 615M, Grade 60 bars shall conform to the requirements of AWS A5.5 for E9018-M or E10018-M electrodes.

Electrodes for manual shielded metal arc welding of A 706/A 706M bars shall conform to the requirements of AWS A5.5 for E8016-C3 or E8018-C3 electrodes.

Solid and composite electrodes for semiautomatic gas metal-arc and flux-cored arc welding of Grade 40 reinforcing bars shall conform to the requirements of AWS A5.18 for ER70S-2, ER70S-3, ER70S-6 or ER70S-7 electrodes; or AWS A5.20 for E70T-1, E70T-5, E70T-6 or E70T-8 electrodes.

Electrodes for semiautomatic welding of ASTM Designation: A 615/A 615M, Grade 60 and ASTM Designation: A 706/A 706M bars shall produce a weld metal deposit with properties conforming to the requirements of Section 5.3.4 of AWS D1.1-96 for ER80S-Ni1, ER80S-Ni2, ER80S-Ni3, ER80S-D2, E90T1-K2 and E91T1-K2 electrodes.

Reinforcing bars shall be preheated for a distance of not less than 6 inches on each side of the joint prior to welding.

For all welding of ASTM Designation: A 615/A 615M, Grade 40 or Grade 60 bars, the requirements of Table 5.2, "Minimum Preheat and Interpass Temperatures," of AWS D1.4-92 are superseded by the following:

> The minimum preheat and interpass temperatures shall be 400° F. for Grade 40 bars and 600° F. for Grade 60 bars. Immediately after completing the welding, at least 6 inches of the bar on each side of the splice shall be covered by an insulated wrapping to control the rate of cooling. The insulated wrapping shall remain in place until the bar has cooled below 200° F.

When welding different grades of reinforcing bars, the electrode shall conform to Grade 40 bar requirements and the preheat shall conform to the Grade 60 bar requirements.

In the event that any of the specified preheat, interpass and post weld cooling temperatures are not met, all weld and heat affected zone metal shall be removed and the splice rewelded.

All welding shall be protected from air currents, drafts, and precipitation to prevent loss of heat or loss of arc shielding. The method of protecting the welding area from loss of heat or loss of arc shielding shall be subject to approval by the Engineer.

Reinforcing bars shall not be direct butt spliced by thermite welding.

The first paragraph of Section 52-1.08C, "Mechanical Butt Splices," of the Standard Specifications is amended to read:

52-1.08C Mechanical Butt Splices.—Mechanical butt splices shall be the sleeve-filler metal type, the sleeve-threaded type, the sleeve-swaged type, the sleeve-filler grout type, the sleeve-lockshear bolt type, the two-part sleeve-forged bar type, or the two-part sleeve-friction bar type, at the option of the Contractor.

The following is added after the third paragraph of Section 52-1.08C, “Mechanical Butt Splices,” of the Standard Specifications:

Slip requirements shall not apply to mechanical lap splices.

The fourth subparagraph of the last paragraph of Section 52-1.08C, "Mechanical Butt Splices," of the Standard Specifications is amended to read:

4. A statement that the splicing systems and materials used in accordance with the manufacturer's procedures will develop not less than the minimum tensile strengths, based on the nominal bar area, of 63,000 psi for ASTM Designation: A 615/A 615M, Grade 40 bars and 80,000 psi for ASTM Designations: A 615/A 615M, Grade 60 and A 706/A 706M bars, and will comply with the total slip requirements and the other requirements in these specifications.

The following is added after Section 52-1.08C(3), "Sleeve-Swaged Mechanical Butt Splices," of the Standard Specifications:

52-1.08C(4) Sleeve-Filler Grout Mechanical Butt Splices.—The sleeve-filler grout type of mechanical butt splices shall consist of a steel splice sleeve that fits closely over the reinforcing bars with a non-shrink grout filler in the annular space between the reinforcing bars and the sleeve and between the ends of the reinforcing bars.

No vibration or movement of the reinforcing steel or sleeve at the splice shall be allowed while the splice is developing sufficient strength to support the reinforcing bars. The Contractor shall submit complete details of the bracing and clamping system to eliminate all vibration or movement at the splice during setup of the filler in accordance with the provisions in Section 5-1.02, "Plans and Working Drawings."

52-1.08C(5) Sleeve-Lockshear Bolt Mechanical Butt Splices.—The sleeve-lockshear bolt type of mechanical butt splices shall consist of a seamless steel sleeve, 2 serrated steel strips welded to the inside of the sleeve, center hole with centering pin, and bolts that are tightened until the bolt heads shear off and the bolt ends are embedded in the reinforcing bars.

52-1.08C(6) Two-Part Sleeve-Forged Bar Mechanical Butt Splices.— The two-part sleeve-forged bar type of mechanical butt splices shall consist of a shop machined two-part threaded steel sleeve that interlocks two hot-forged reinforcing bars ends. The forged bar ends may be either shop produced or field produced.

52-1.08C(7) Two-Part Sleeve-Friction Bar Mechanical Butt Splices.— The two-part sleeve-friction bar type of mechanical butt splices shall consist of a shop machined two-part threaded steel sleeve whose ends are friction welded, in the shop, to the reinforcing bars ends.

The third paragraph of Section 52-1.08D, "Qualification of Welding and Mechanical Splicing," of the Standard Specifications is replaced with the following:

Each operator qualification test for mechanical splices shall consist of 2 sample splices. Each mechanical splice procedure test shall consist of 2 sample splices.

For sleeve-filler, sleeve-threaded, sleeve-lockshear bolt and two-part sleeve friction bar mechanical butt splices, all sample splices shall be made on the largest reinforcing bar size to be spliced by the procedure or operator being tested except that No. 14 bars may be substituted for No. 18 bars.

For sleeve-swaged and two-part sleeve-forged mechanical butt splices, and mechanical lap splices, all sample splices shall be made on the largest reinforcing bar size of each deformation pattern to be spliced by the procedure or operator being tested. When joining new reinforcing bars to existing reinforcement, the qualification test sample bars shall be made with the deformation pattern of the new reinforcement to be joined.

Section 52-1.08E, "Job Control Tests," of the Standard Specifications is replaced with the following:

52-1.08E Job Control Tests.— When mechanical butt splices, shop produced complete joint penetration butt welded splices, or shop produced resistance butt welded splices are used, the Contractor shall furnish job control tests from a local qualified testing lab. A job control test shall consist of the fabrication, under conditions used to produce the splice, and the physical testing of 3 sample splices for each lot of 150 splices.

A lot of mechanical butt splices is defined as 150, or fraction thereof, of the same type of mechanical butt splices used for each combination of bar size and bar deformation pattern that is used in the work.

A lot of shop produced complete joint penetration butt welded splices, or shop produced resistance butt welded splices, is defined as 150, or fraction thereof, of the same type of welds used for each combination of bar size and bar deformation pattern that is used in the work.

When joining new reinforcing bars to existing reinforcement, the job control test shall be made with the deformation pattern of the new reinforcement to be joined.

A sample splice shall consist of a splice made at the job site to connect two 30-inch, or longer, bars using the same splice materials, position, location, and equipment, and following the same procedures as are being used to make splices in the work. Shorter sample splice bars may be used if approved by the Engineer.

Sample splices shall be made and tested in the presence of the Engineer or the Engineer's authorized representative.

Sample splices shall be suitably identified with weatherproof markings prior to shipment to the testing laboratory.

For sleeve-threaded mechanical butt splices, the reinforcing bars to be used for job control tests shall be fabricated on a random basis during the cutting of threads on the reinforcing bars of each lot and shipped to the job site with the material they represent.

For shop produced complete joint penetration butt welds, shop produced resistance butt welded splices and all types of mechanical butt splices, except the sleeve-threaded type, the Engineer will designate when samples for job control tests are to be fabricated, and will determine the limits of the lot represented by each job control test.

Should the average of the results of tests made on the 3 sample splices or should more than one sample splice in any job control test fail to meet the requirements for splices, all splices represented by that test will be rejected in accordance with the provisions in Section 6-1.04, "Defective Materials," of the Standard Specifications. This rejection shall prevail unless the Contractor, at the Contractor's expense, obtains and submits evidence, of a type acceptable to the Engineer, that the strength and quality of the splices in the work are acceptable.

Section 52-1.08F, "Nondestructive Splice Tests" of the Standard Specifications is replaced with the following:

52-1.08F Nondestructive Splice Tests.—All required radiographic examinations of complete joint penetration butt welded splices shall be performed by the Contractor in accordance with the requirements of AWS D 1.4 and these specifications.

Prior to radiographic examination, welds shall meet the requirements of Section 4.4, "Quality of Welds," of AWS D1.4-92.

Radiographic examinations shall be performed on 25 percent of all complete joint penetration butt welded splices from a production lot. The size of a production lot will be a maximum of 100 splices. The Engineer will select the splices which will compose the production lot and also the splices within each production lot to be radiographically examined.

Should more than 12 percent of the splices which have been radiographically examined in any production lot be defective, an additional 25 percent of the splices, selected by the Engineer from the same production lot, shall be radiographically examined. Should more than 12 percent of the cumulative total of splices tested from the same production lot be defective, all remaining splices in the lot shall be radiographically examined.

Additional radiographic examinations performed due to the identification of defective splices shall be at the Contractor's expense.

All defects shall be repaired in accordance with the requirements of AWS D1.4.

Radiographic examinations will not be required for either shop produced complete joint penetration butt welds or shop produced resistance butt welded splices of No. 8 or smaller bars used as spiral or hoop reinforcement.

In addition to radiographic examinations performed by the Contractor, any mechanical or welded splice may be subject to inspection or nondestructive testing by the Engineer. The Contractor shall provide sufficient access facilities in the shop and at the jobsite to permit the Engineer or his agent to perform the inspection or testing.

The Contractor shall notify the Engineer in writing 48 hours prior to performing any radiographic examinations.

The radiographic procedure used shall conform to the requirements of ASME Boiler and Pressure Vessels Code, Section V, Article 2 and the following:

Two exposures shall be made for each complete joint penetration butt welded splice. For each of the two exposures, the radiation source shall be centered on each bar to be radiographed. The first exposure shall be made with the radiation source placed at zero degrees from the top of the weld and perpendicular to the weld root and identified with a station mark of "0." When obstructions prevent a zero degree placement of the radiation source for the first exposure, and when approved in writing by the Engineer, the source may be rotated, around the centerline of the reinforcing bar, a maximum of 25 degrees. The second exposure shall be at 90 degrees to the "0" station mark and shall be identified with a station mark of "90."

For field produced complete joint penetration butt welds, no more than one weld shall be radiographed during one exposure. For shop produced complete joint penetration butt welds, if more than one weld is to be radiographed during one exposure, the angle between the root line of each weld and the direction to the radiation source shall be not less than 65 degrees.

Radiographs shall be made by either X-ray or gamma ray. Radiographs made by X-ray or gamma rays shall have densities of not less than 2.3 nor more than 3.5 in the area of interest. A tolerance of 0.05 in density is allowed for densitometer variations. Gamma rays shall be from the iridium 192 isotope and the emitting specimen shall not exceed 0.175-inch in the greatest diagonal dimension.

The radiographic film shall be placed perpendicular to the radiation source at all times; parallel to the root line of the weld unless source placement determines that the film must be turned; and as close to the root of the weld as possible.

The minimum source to film distance shall be maintained so as to insure that all radiographs maintain a maximum geometric unsharpness of 0.020 at all times, regardless of the size of the reinforcing bars.

Penetrameters shall be placed on the source side of the bar and perpendicular to the radiation source at all times. One penetrameter shall be placed in the center of each bar to be radiographed, perpendicular to the weld root, and adjacent to the weld. Penetrameter images shall not appear in the weld area.

When radiography of more than one weld is being performed per exposure, each exposure shall have a minimum of one penetrameter per bar, or three penetrameters per exposure. When 3 penetrameters per exposure are used, one penetrameter shall be placed on each of the 2 outermost bars of the exposure, and the remaining penetrameter shall be placed on a centrally located bar.

An allowable weld buildup of 1/8 inch may be added to the total material thickness when determining the proper penetrameter selection. No image quality indicator equivalency will be accepted. Wire penetrameters or penetrameter blocks shall not be used.

Penetrameters shall be sufficiently shimmed using a radiographically identical material. Penetrameter image densities shall be a minimum of 2.0 and a maximum of 3.6.

All radiographic film shall be Class 1, regardless of the size of reinforcing bars.

Radiographs shall be free of film artifacts and processing defects, including, but not limited to, streaks, scratches, pressure marks, or marks made for the purpose of identifying film or welding indications.

Each splice shall be clearly identified on each radiograph and the radiograph identification and marking system shall be established between the Contractor and the Engineer before radiographic inspection begins. Film shall be identified by lead numbers only; etching, flashing, or writing in identifications of any type will not be permitted. Each piece of film identification information shall be legible and shall include, as a minimum, the following information: Contractor's name, date, name of nondestructive testing firm, initials of radiographer, contract number, part number, and weld number. The letter "R" and repair number shall be placed directly after the weld number to designate a radiograph of a repaired weld.

Radiographic film shall be developed within a time range of one minute less to one minute more than the film manufacturer’s recommended maximum development time. Development on the jobsite will not be allowed.

Processing chemistry shall be done with a consistent mixture and quality, and processing rinses and tanks shall be clean to ensure proper results. Records of all developing processes and any chemical changes to the developing processes shall be kept and furnished to the Engineer upon request. The Engineer may request, at any time, that a sheet of unexposed film be processed in the presence of the Engineer to verify processing chemical and rinse quality.

All radiographs shall be interpreted and graded by a Level II or Level III technician who is qualified in accordance with the American Society for Nondestructive Testing's Recommended Practice No. SNT-TC-1A. The results of these interpretations shall be recorded on a signed certification and a copy kept with the film packet.

Technique sheets prepared in accordance with ASME Boiler and Pressure Vessels Code, Section V, Article 2 Section T-291 shall also contain the developer temperature, developing time, fixing duration and all rinse times.

All radiographic envelopes shall have clearly written on the outside of the envelope the following information: name of the Contractor's Quality Control Manager (QCM), name of the nondestructive testing firm, name of the radiographer, date, contract number, complete part description, and all included weld numbers or a report number, as detailed in the Contractor's Quality Control Plan (QCP). In addition, all innerleaves shall have clearly written on them the part description and all included weld numbers, as detailed in the Contractor's QCP.

10-1.33 EPOXY-COATED REINFORCEMENT

Epoxy-coated reinforcement shall conform to the provisions in Section 52, "Reinforcement," of the Standard Specifications and these special provisions.

Section 52-1.02B, "Epoxy-coated Bar Reinforcement," of the Standard Specifications is replaced with the following:

52-1.02B Epoxy-coated Reinforcement.—Bar reinforcement to be epoxy-coated shall conform to the ASTM Designation and grade required or permitted by Section 52-1.02A, "Bar Reinforcement," for the location or type of structure involved. The epoxy-coated bar reinforcement shall conform to the provisions of ASTM Designation: A 775/A 775M, except as provided herein. Fabrication and jobsite handling of the epoxy-coated bar reinforcement shall conform to the provisions of ASTM Designation: D 3963/D 3963M, except as provided herein.

Wire reinforcement to be epoxy-coated shall conform to the ASTM Designation and grade required or permitted by Section 52-1.02D, "Reinforcing Wire and Plain Bars," for the location or type of structure involved. The coated wire reinforcement shall conform to the provisions for Class A, Type 1 coating of ASTM Designation: A 884/A 884M except as provided herein.

Appendices X1, "Guidelines For Job-Site Practices," of ASTM Designations: A 775/A 775M and A 884/A 884M shall apply except as provided herein. The term "shall" shall replace the term "should" in these appendices. Sections X1.2 shall not apply.

All coatings shall be light green in color.

Except for field welding of butt splices, all welding of reinforcement shall be complete prior to epoxy coating the reinforcement.

When any portion of a reinforcing bar or wire requires epoxy coating, the entire bar or wire shall be coated.

Within areas where epoxy-coated reinforcement is required, tie wire and bar chairs or other metallic devices used to secure or support the reinforcement shall be plastic-coated or epoxy-coated to prevent corrosion of the devices or damage to the coated reinforcement.

Prior to coating, the Contractor shall furnish to the Transportation Laboratory a representative 4-ounce sample from each batch of epoxy coating material to be used. Each sample shall be packaged in an airtight container identified with the manufacturer's name and batch number.

Two 30-inch long samples of coated bar or wire reinforcement from each size and from each load shipped to the jobsite shall be furnished to the Engineer for testing. These samples shall be representative of the material furnished. These samples, as well as any additional random samples taken by the Engineer, may be tested for specification compliance. Such additional sampling, and all tests performed by the Engineer, may be performed at any location deemed appropriate by the Engineer. Failure of any sample to meet the requirements of the specifications will be cause for rejection.

If any bar or wire reinforcement tested for coating thickness or for flexibility of coating fails to meet the requirements for coated bars in Section 8 of ASTM Designation: A 775/A 775M or A 884/A 884M, respectively, 2 retests on random samples taken from bars represented by the failed test will be conducted for each failed test. If the results of both retests meet the specified requirements, the coated bars represented by the samples may be certified as meeting the test requirements.

Epoxy-coated reinforcement shall be covered with an opaque polyethylene sheeting or other suitable protective material to protect the reinforcement from exposure to sunlight, salt spray and weather. For stacked bundles, the protective covering shall be draped around the perimeter of the stack. The covering shall be adequately secured; however, it should allow for air circulation around the reinforcement to prevent condensation under the covering. Epoxy-coated reinforcement shall not be stored within 1000 feet of ocean or tidal water for more than 2 months.

All visible damage to the coatings caused by shipping, handling or installation shall be repaired as required for repairing coating damaged prior to shipment as specified in ASTM Designation: A 775/A 775M for bar reinforcement or ASTM Designation: A 884/A 884M for wire reinforcement. When the extent of coating damage prior to repair exceeds 2 percent of the bar or wire surface area in any one foot length, repair of the bar or wire will not be allowed and the coated bar or wire will be rejected.

The patching material and process shall be suitable for field application. The patching material shall be prequalified as required for the coating material and shall be either identified on the container as a material compatible with the bar reinforcement coating, or shall be accompanied by a Certificate of Compliance certifying that the material is compatible with the bar reinforcement coating. Damaged areas shall be patched in accordance with the patching material manufacturer's recommendations. If damage to a bar occurs during field bending the area shall be patched immediately with the prequalified patching material.

Except for lap splices, all splices for epoxy-coated reinforcement shall be coated with a corrosion protection covering that is on the Department's list of approved products. The covering shall be installed in accordance with the manufacturer's recommendations and as directed by the Engineer. The list is available from the Office of Materials Engineering and Testing Services, 5900 Folsom Boulevard, Sacramento, CA 95819, telephone (916) 227-7000.

The third paragraph of Section 52-1.04, "Inspection," of the Standard Specifications is amended to read:

A Certificate of Compliance conforming to the provisions in Section 6-1.07, "Certificates of Compliance," shall be furnished for each shipment of epoxy-coated bar or wire reinforcement certifying that the coated bars conform to the requirements of ASTM Designation: A 775/A 775M and Section 52-1.02B, "Epoxy-coated Bar Reinforcement." Said Certificate of Compliance shall include all the certifications specified in ASTM Designation: A 775/A 775M and a statement that the coating material has been prequalified by acceptance testing performed by the Valley Forge Laboratories, Inc., Devon, Pennsylvania.

10-1.34 STEEL STRUCTURES

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

GENERAL

Fabricators of structural steel shall be certified under the AISC Quality Certification Program, Category Cbr, Major Steel Bridges.

All manufacturing processes for steel fastener and high strength steel fastener assemblies furnished for incorporation into the work on this project shall occur in the United States; with the exception that pig iron and processed, pelletized and reduced iron ore manufactured outside of the United States may be used in the domestic manufacturing process for such steel and iron materials. The application of coatings, such as epoxy coating, galvanizing, painting and any other coating that protects or enhances the value of such steel material shall be considered a manufacturing process subject to these requirements.

A Certificate of Compliance, conforming to the provisions in Section 6-1.07, "Certificates of Compliance," of the Standard Specifications, shall be furnished for steel fastener and high strength steel fastener assemblies. The certificates, in addition to certifying that the materials comply with the specifications, shall also specifically certify that all manufacturing processes for the materials occurred in the United States, except for the exceptions allowed herein.

Any existing steel damaged as result of the Contractor's operation shall be repaired. Prior to repairing the existing steel, the Contractor shall determine by non-destructive methods the carbon equivalency (CE) of the steel local to the damaged area in accordance with Section 5.4 of AWS D 1.5.

The Contractor shall submit to the Engineer for approval the CE test results and the proposed method to repair the damaged existing steel based upon the CE test results in accordance with the requirements in Section 5-1.02, "Plans and Working Drawings," of the Standard Specifications. No remedial work shall begin until the repair method has been approved by the Engineer.

Attention is directed to "Welding Quality Control" of these special provisions.

The first paragraph in Section 55-1.02, "Drawings," of the Standard Specifications is amended to read:

55-1.02 Drawings.— The Contractor shall submit working drawings for structural steel to the Office of Structure Design (OSD) for approval in conformance with the provisions in Section 5-1.02, "Plans and Working Drawings." For initial review, 6 sets of the drawings shall be submitted for highway bridges and 10 sets shall be submitted for railroad bridges. After review, between 6 and 12 sets, as requested by the Engineer, shall be submitted to OSD for final approval and for use during construction.

The first sentence of the seventh paragraph in Section 55-1.02, "Drawings," of the Standard Specifications is amended to read:

At the completion of each structure on the contract, one set of reduced prints on 20 pound (minimum) bond paper, 11 inches x 17 inches in size, of the corrected original tracings of all working drawings for each structure shall be furnished to the Engineer.

Paragraphs 7 through 9 of Section 55-1.02, "Drawings," of the Standard Specifications areamended to read:

At the completion of each structure on the contract, one set of reduced prints on 20 pound (minimum) bond paper, 11 inches by 17 inches in size, of the corrected original tracings of all working drawings for each structure shall be furnished to the Engineer. Reduced prints that are common to more than one structure shall be submitted for each structure. An index prepared specifically for the drawings for each structure containing sheet numbers and titles shall be included on the first reduced print in the set for each structure. Reduced prints for each structure shall be arranged in the order of drawing numbers shown in the index.

The edge of the corrected original tracing image shall be clearly visible and visually parallel with the edges of the page. A clear, legible symbol shall be provided on the upper left side of each page to show the amount of reduction and a horizontal and vertical scale shall be provided on each reduced print to facilitate enlargement to original scale.

For railroad bridges, in addition to the reduced prints of the working drawings, the Contractor shall furnish to the Engineer one set of working drawings consisting of either ink tracings on cloth, ink tracings on polyester base drafting film, silver sensitized cloth duplicate tracings, or silver sensitized polyester based reproduction films with matte surface on both sides.

The Contractor shall submit structural steel working drawings to the Engineer for approval in conformance with the provisions in Section 55-1.02, “Drawings,” and these special provisions.

The Contractor shall submit to the Engineer a schedule of structural steel working drawing submittals conforming to the following requirements:

The first schedule shall be submitted no more than 60 days after contract approval and at least 30 days prior to submitting any working drawings on the contract, unless otherwise approved in writing by the Engineer.

The schedule shall then be updated and submitted to the Engineer at least every 90 calendar days until all structural steel working drawings have been approved.

Each schedule shall project the submittal of all working drawings for at least one year. All working drawings submittals shall appear on the schedule a minimum of 30 days prior to their submittal for review. The schedule shall include the following information:

1. the dates the working drawing submittals are to be submitted,
2. the approximate number of sheets to be included in each submittal,
3. the location where the work is to be performed,
4. a general description of the work to be performed.

In addition, the Contractor shall submit a written "Notification of Working Drawings" to the Engineer at least 30 calendar days in advance of submitting any working drawing submittal. The advance notification shall include the following information:

1. the date the working drawing submittal or submittals are to be submitted,
2. the number of sheets to be included in each submittal,
3. the location where the work is to be performed,
4. a description of the work to be performed.

In addition to the requirements of Section 55-1.02, "Drawings," of the Standard Specifications and these special provisions, the following requirements shall apply:

The Contractor shall allow the review times specified herein after complete working drawings and all supporting data are submitted to the Engineer. Complete drawings shall be fully detailed to complete the fabrication and erection of the required structural steel work including all field dimensions verified by the Contractor.

The review time for a set of working drawings will be considered as starting when the Engineer has received the complete set of working drawings and all supporting data.

If at any time during the review process the working drawings are determined to be incomplete, then the drawings will be rejected and returned to the Contractor for correction. The review time on a set of returned drawings will be considered stopped on the date the drawings are date stamped by the Engineer for return. The Contractor shall submit a notice of resubmittal to the Engineer within 5 days after receipt of the rejected set. The notice shall contain the submittal number, revisions number, and date the revised set will be returned for review. The revised set shall contain the same work as was originally submitted.

After a revised set of drawings have been received by the Engineer, the new review time for that set of revised drawings will be the original review time, less the time already spent under review before rejection, plus 3 weeks.

Any time during the review process, a request for information, regarding the working drawings, may be submitted to the Contractor by the Engineer. The working drawing review time will continue with no interruptions unless the Contractor does not respond to the Engineer's request for information within 3 working days, at which time the review time will stop.

The review time for a set of working drawings will be considered as completed on the date the working drawings have been reviewed, approved, and mailed to the Contractor with a date stamp by the Engineer.

After review and approval of the working drawings, between 6 and 12 sets, as requested by the Engineer, shall be submitted to the Engineer for final approval. These sets will be the only sets stamped "Approved" and will be distributed for use during construction.

Working drawings shall be submitted in sets not exceeding 20 sheets. Each set of working drawings shall be identified with a unique and sequential number. Multiple sets of working drawings may be submitted simultaneously.

In the event several sets of working drawings are submitted simultaneously, or additional sets of drawings are submitted for review before the review of the previously submitted sets of drawings have been completed, the Contractor shall designate the sequence in which all of the sets of drawings which have been submitted are to be reviewed.

The Contractor may choose to change the priority of the set of working drawings that is designated as top priority. The Contractor shall submit a written notification outlining his proposal for reprioritization of working drawing submittal reviews in conformance with the following requirements:

1) All sets of working drawings under review shall be reprioritized by the Contractor.
2) The proposed reprioritization, including review time for each submittal, shall be agreed upon by the Engineer and the Contractor before it is approved and implemented.
3) The review time for the new top priority set will restart and will not exceed 6 weeks from the time that the Contractor's reprioritization proposal has been approved, unless the set is returned for revisions.
4) The review time for each submittal will be adjusted based on the Contractor's reprioritization and the total number of working drawings under review at the time of the written notification.

When the total number of working drawings under review is less than 60 sheets, then the time to be provided for review for each set of drawings in the sequence shall not exceed 6 weeks for the top priority set, and not exceed 8 weeks from the original date received by the Engineer for each set of lower priority drawings which is still under review.

When the total number of working drawings under review exceeds 60 sheets, then the time to be provided for review for each set of drawings in the sequence shall not exceed 6 weeks for the top priority set, and not exceed 12 weeks from the original date received by the Engineer for each set of lower priority which is still under review.

Should the Engineer fail to review the complete working drawing submittal within the time specified and if, in the opinion of the Engineer, the Contractor's controlling operation is delayed or interfered with by reason of the delay in reviewing the working drawing submittal, an extension of time commensurate with the delay in completion of the work thus caused will be granted in accordance with Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

Approval by the Engineer of the working drawings or field inspection performed by the Engineer will in no way relieve the Contractor of full responsibility for verifying field dimensions.

Steel for members, shown on the plans for Bridge No 34-0003 as fracture critical members, shall conform to the requirements of ANSI/AASHTO/AWS D1.5, Section 12, "AASHTO/AWS Fracture Control Plan (FCP) for Non-Redundant Members." Charpy V-notch (CVN) impact values for fracture critical members shall conform to the requirements for Zone 2.

The first sentence of the second paragraph in Section 55-1.03, "Inspection," of the Standard Specifications is amended to read:

The Contractor shall furnish to the Engineer a copy of mill orders, certified mill test reports, a Certificate of Compliance for all fabricated structural steel to be used in the work, other than steel which is to be used under the provisions in Section 55-2.07, "Unidentified Stock Material, " and other reports or certificates required by the specifications.

MATERIALS

The first paragraph, including the material table, in Section 55-2.01, "Description," of the Standard Specifications is amended to read:

55-2.01 Description.—The various materials shall conform to the specifications of ASTM as listed in the following tabulation with certain modifications and additions as specified:

MATERIAL	SPECIFICATION
Structural steel	ASTM Designation: A 709/A 709M, Grade 36 [250] or {A 36/A 36M}[(a)]
High strength low alloy columbium vanadium steel	ASTM Designation: A 709/A 709M, Grade 50 [345] or {A 572/A 572M, Grade 50 [345]}[(a)]
High strength low alloy structural steel	ASTM Designation: A 709/A 709M, Grade 50W [345 W] or {A 588/A 588M}[(a)]
High-yield strength, quenched and tempered alloy steel plate suitable for welding	ASTM Designation: A 709/A 709M, Grade 100 [690] and Grade 100W [690W] or {A 514/A 514M}[(a)]
Steel fastener components for general applications:	
Bolts and studs which include threaded rods and nonheaded anchor bolts	ASTM Designation: A 307 or AASHTO Designation: M 314, Grade 36 or 55 including supplementary requirements
High-strength bolts and studs which include threaded rods and nonheaded anchor bolts	ASTM Designation: A 449
Nuts	ASTM Designation: A 563 including Appendix X1[(b)]
Washers	ASTM Designation: F 844
Components of high-strength steel fastener assemblies for use in structural steel joints:	
Bolts	ASTM Designation: A 325, Type 1
Tension control bolts	ASTM Designation: F 1852, Type 1
Nuts	ASTM Designation: A 563 including Appendix X1[(b)] or A 563M including Appendix X1[(b)]

Hardened washers Direct tension indicators	ASTM Designation: F 436 or F 436M ASTM Designation: F 959 or F 959M, zinc coated
Carbon steel for forgings, pins and rollers	ASTM Designation: A 668/A 668M, Class D
Alloy steel for forgings	ASTM Designation: A 668/A 668M, Class G
Pin nuts	ASTM Designation: A 36/A 36M
Carbon-steel castings	ASTM Designation: A 27/A 27M, Grade 65-35 [450-240], Class 1
Malleable iron castings	ASTM Designation: A 47, Grade 32510 or A 47M, Grade 22010
Gray iron castings	ASTM Designation: A 48, Class 30B
Carbon steel structural tubing	ASTM Designation: A 500, Grade B or A 501
Steel pipe (Hydrostatic testing will not apply)	ASTM Designation: A 53, Type E or S, Grade B; A 106, Grade B; or A 139, Grade B
Stud connectors	ASTM Designation: A 108 and ANSI/AASHTO/AWS D1.5
(a) Grades that may be substituted for the equivalent ASTM Designation: A 709 steel, at the Contractor's option, subject to the modifications and additions specified and to the requirements of A 709. (b) Zinc-coated nuts that will be tightened beyond snug or wrench tight shall be furnished with a dry lubricant conforming to Supplementary Requirement S2 in ASTM Designation: A 563.	

The second paragraph in Section 55-2.01, "Description," of the Standard Specifications is deleted.
The fifth paragraph in Section 55-2.01, "Description," of the Standard Specifications is amended to read:

All structural steel plate used for the fabrication of tension members, tension flanges, eyebars and hanger plates and for splice plates of tension members, tension flanges and eyebars shall meet the longitudinal Charpy V-notch impact value requirements specified herein. Sampling procedures shall conform to the provisions in ASTM Designation: A 673/A 673M. The H (Heat) frequency of testing shall be used for structural steels conforming to ASTM Designations: A 709/A 709M, Grades 36, 50 and 50W. The P (Piece) frequency of testing shall be used for structural steel conforming to ASTM Designation: A 709/A 709M, Grades 100 and 100W. Charpy V-notch impact values shall be determined in accordance with ASTM Designation: E 23.

The first paragraph in Section 55-2.02, "Structural Steel," of the Standard Specifications is amended to read:

55-2.02 Structural Steel.—Unless otherwise specified or shown on the plans, all structural steel plates, shapes and bars shall conform to ASTM Designation: A 709/A 709M, Grade 36.

Carbon steel for the wind tongue assembly pin shall conform to the requirements of ASTM Designation: A668, Class J. Castings for the wind tongue assemblies bearing blocks shall conform to the requirements of ASTM Designation: ASTM 128, Grade 105-85.

High-strength fastener assemblies, and other bolts attached to structural steel with nuts and washers shall be zinc-coated.

Check Testing.—Structural steel shall conform to the designated ASTM Standard and the check testing requirements of this section.

Check samples shall be furnished for each heat of maximum thickness of:

Fracture critical members.

Damper brackets

Steel plates, shapes or bars containing check samples shall be furnished from the mill with extra length in order to provide for removal of material for check samples at the point of fabrication. Check samples may be cut from either end of the designated plate, shape or bar.

At the option of the Contractor, check samples may be removed at the rolling mill rather than at the point of fabrication. The sample will be removed from the mill plate that will be stripped by the fabricator to produce the designated plate and may be taken from any location within that plate. The mill plate from which samples are removed shall be marked with the same identifying numbers as are used on the samples. If the Contractor requests that samples be removed at the rolling mill, the Contractor will be charged for the cost of providing State inspection at the mill to witness the removal of samples, as provided in "Measurement and Payment" of these special provisions.

Unless otherwise directed, material for check samples shall be removed by the Contractor in the presence of the Engineer. Check samples for plates wider than 24 inches shall be 14 inches wide and 18 inches long with the long dimension transverse to the direction of rolling. Check samples for all other products shall be 18 inches long, taken in the direction of rolling, and the width shall be the product width. Check samples shall be removed and delivered to the Engineer before the material is fabricated into components and preferably when it is still being prepared for fabrication. The direction of rolling, heat numbers, and plate numbers shall be marked on the samples with paint or other indelible marking material or may be steel stamped in one corner of the plate.

Unless otherwise directed, check samples shall be delivered to the Transportation Laboratory at the Contractor's expense. The check samples will be tested by the Transportation Laboratory for compliance with the requirements specified in ASTM and these special provisions. Check sample test results will be reported to the Contractor within 10 working days of delivery to the Transportation Laboratory. In the event several samples are submitted on the same day, an additional day will be added for each 2 samples submitted. The test report will be made for the group of samples.

The results of the tensile and impact tests shall not vary more than 5 percent below specified minimum or 5 percent above specified maximum requirements except that if the initial check test results vary more than 5 percent but not more than 10 percent from the specified requirements, a re-test may be performed on another sample from the same heat and thickness. The results of the re-test shall not vary more than 5 percent from the original specified requirements. If the results of check tests exceed these permissible variations, material planned for use from the heat represented by said check samples shall be subject to rejection.

FABRICATION

The first paragraph of Section 55-3.05, "Facing and Bearing Surfaces," of the Standard Specifications is amended to read:

> **55-3.05 Flatness of Faying (Contact) and Bearing Surfaces.—**Surfaces of bearing and base plates and other metal surfaces that are to come in contact with each other or with ground concrete surfaces or with asbestos sheet packing shall be flat to within 1/32 inch tolerance in 12 inches and to within 1/16 inch tolerance overall. Surfaces of bearing and base plates and other metal bearing surfaces that are to come in contact with preformed fabric pads, elastomeric bearing pads or portland cement mortar shall be flat to within 1/8 inch tolerance in 12 inches and to within 3/16 inch tolerance overall.

Machine-finished surfaces, including the inside surface of the bearing block and pin for the wind tongues, shall be coated as soon as practicable after being accepted, and before removal from the shop, with a corrosion inhibitor. Surfaces of iron and steel castings, machine-finished for the sole purpose of removing scales, scabs, fins, blisters or other surface deformations, shall not be so coated.

The corrosion inhibitor used for coating machine-finished surfaces shall provide a long-term, firm waxy film, resistant to humidity and salt spray and be non-hardening. The corrosion inhibitor shall be a commercially manufactured product for protecting machined surfaces subjected to long periods of storage or adverse conditions during shipment. Before final assembly, the corrosion inhibitor shall be completely removed.

Paragraphs 1 through 5, excluding Section 55-3.14A, of Section 55-3.14, "Bolted Connections," of the Standard Specifications are amended to read:

> **55-3.14 Bolted Connections.—**Bolted connections in structural steel joints, unless otherwise shown on the plans or specified in the special provisions, shall be made with high-strength steel fastener assemblies. These fastener assemblies shall consist of either 1) a high-strength steel bolt, nut and hardened washer or 2) a tension

control bolt, nut and hardened washer. A direct tension indicator (DTI) may be used with the high-strength bolt, nut and hardened washer assembly.

Bolted connections using fastener assemblies shall conform to the "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" (RCSC Specification) approved by the Research Council on Structural Connections of the Engineering Foundation, and the provisions of these special provisions.

When reference is made to the RCSC Specification, the "Allowable Stress Design" version shall be used when allowable stress design is shown on the plans and the "Load and Resistance Factor Design" version shall be used when load factor design or load and resistance factor design is shown on the plans.

All connections made with fastener assemblies shall be tensioned and inspected after tensioning, whether classified as a slip critical or bearing type connection, unless otherwise designated on the plans.

The hardened washer shall be installed under the nut or bolt head, whichever is the element turned in tightening. Nuts shall be located, wherever practicable, on the side of the member that will not be visible from the traveled way. Nuts for bolts that will be partially embedded in concrete shall be located on the side of the member that will be encased in concrete.

Each length and diameter of fastener assemblies used in any one joint of a high-strength bolted connection shall be from the same rotational capacity lot. The Contractor shall keep a record of which rotational capacity lots are used in each joint.

The Contractor shall provide, calibrate and maintain the equipment and tools necessary for the preliminary testing, installation and inspection of all fasteners.

Bolt tension measuring devices and torque wrenches shall be calibrated within one year prior to first being used on the job, and a minimum of once each year thereafter. This calibration shall be done by a qualified independent laboratory or authorized warranty repair and calibration center recognized by the tool manufacturer. Bolt tension measuring devices shall be calibrated, to within one percent of the actual tension value, with a minimum of 4 verification readings evenly spaced over a range of 20 to 80 percent of full scale. Torque wrenches shall have either a dial gage or digital read-out. Torque wrenches shall be calibrated, to within 2 percent of the actual torque value, with a minimum of 4 verification readings evenly spaced over a range of 20 to 100 percent of full scale. Test equipment used for certification and calibration standards shall be traceable to the National Institute of Standards and Technology.

Prior to the use of bolt tension measuring devices or torque wrenches, the Contractor shall furnish to the Engineer certificates of calibration with plots of verification readings for each device or wrench.

In addition to the submittals required in Section 55-1.03, "Inspection," of the Standard Specifications, the Contractor shall furnish certified test reports of tests on fastener components and fastener assemblies performed prior to shipment to the job-site. Certified test reports for fastener components and fastener assemblies shall be furnished to the Engineer prior to use of the fastener assembly. The certified test reports shall include the rotational capacity lot numbers for fastener assemblies supplied and test reports specified in the "Certification," "Report," "Number of Tests and Retests," and "Certification and Test Report" sections in the appropriate ASTM specifications for the fastener components.

For all bolted connections, the contact surfaces shall be cleaned and coated before assembly in conformance with the provisions for cleaning and painting structural steel in the special provisions.

High-strength steel fasteners shall consist of a tension control bolt, nut and hardened washer, whenever practicable. Direct tension indicators shall not be used at any location. Tension control bolt heads shall be round (button-head) and shall be oriented to match the appearance of the existing adjacent rivets, whenever practicable.

High-strength bolted connections using A 490 bolts shall be installed with two hardened washers on the side of the member that will be visible from the traveled way.

Holes for bolted connections in structural steel joints consisting of new and existing structural steel or existing structural steel may consist of both sub-punched or sub-drilled holes and holes punched or drilled full size as approved by the Engineer and shall conform to these special provisions.

The finished holes in structural steel plates nearest to the nut or bolt head shall not be more than 1/16 inch larger than the nominal diameter of the bolt.

When the holes in other existing structural steel plate are 1/16 inch larger than the nominal diameter of the bolt, the holes may be reamed to slots conforming to the provisions for short-slotted holes as defined in "Specification for Structural Joints Using ASTM A325 or A490 Bolts" (RCSC Specification) approved by the Research Council on Structural Connections. The axis of the slot in short-slotted holes in existing interior plies shall be normal to the direction of the load.

Bolts with diameters up to 1/4 inch larger than the diameter of the bolt shown on the plans may be used, provided that the required clearances and edge distances are not reduced below that required for the larger bolt and the remaining net section of the structural steel plate is adequate.

Section 55-3.14, "Bolted Connections," of the Standard Specifications is amended by adding the following paragraphs:

55-3.14B Installation.—If water soluble lubricants are used on components of the fastener assemblies, fastener installation will not be permitted when surface moisture is present at a high-strength bolted connection. The Engineer may require the Contractor to perform additional installation tension tests and rotational capacity tests before fastener installation and tensioning is performed at any high-strength bolted connection during inclement weather.

Bolts shall be tightened to the required tension by use of a tension control bolt installation wrench, a pneumatic or hydraulic wrench, a calibrated manual torque wrench, the turn-of-nut method, or by using mechanically zinc coated direct tension indicators. The pneumatic or hydraulic wrench shall have an adjustable control unit that can be set to positively shut off at the desired torque.

The threaded ends of fastener assemblies projecting past the outer face of the nut (thread stickout), where first full formed threads are present, shall be at least flush with, but not extend more than 1/4 inch beyond, the outer face of the nut. A maximum of one hardened washer, in addition to the single washer required under the turned element, may be installed under the non-turning element of the fastener assembly. The thread stickout of studs, rods and anchor bolts, shall be at least 1/8 inch , and there shall be a minimum of 3 full threads located within the grip of the connection. In addition, a minimum of 3 full threads shall be located between the bearing surfaces of the bolt head and nut. The total stickout shall not be excessive.

Larger bolts, having diameters up to 1/4 inch greater than the diameter of the bolt shown on the plans, may be used if approved by the Engineer provided that spacing and edge distance requirements for the larger bolt are met and the net section is adequate.

When DTIs are used, one DTI shall be installed under each bolt head with the DTI protrusions contacting the bearing surface of the bolt head. To tension the bolt, the bolt head shall be held stationary and the nut turned. Unless otherwise specified, manufacturer's installation procedures shall be followed. Each bolt shall be tensioned in at least 2 tightening stages until at least 50% of the gaps on each DTI are greater than zero and less than 0.005 inch. Complete crushing of all DTI protrusions (0 gaps) on any given DTI will be cause for rejection.

Any tools used to snug tight tension control bolts shall not engage the spline end of the bolt.

The same head orientation shall be used within any one high-strength bolted connection.

55-3.14C Rotational Capacity Testing Prior to Shipment to Job Site.—Rotational capacity tests on fastener assemblies shall be performed as specified in the special provisions.

55-3.14D Installation Tension Testing and Rotational Capacity Testing After Arrival to Job Site.—Installation tension tests and rotational capacity tests on fastener assemblies shall be performed as specified in the special provisions.

55-3.14E Inspection.—For all types of fastener assemblies, at least 10%, but no fewer than 2 bolts of each rotational capacity lot used in each high-strength bolted connection shall be inspected after tensioning in conformance with the requirements of Section 9, "Inspection," of the RCSC Specification. The inspection of a completed joint shall be performed within 48 hours after all fasteners in this joint have been tensioned. The Contractor shall be responsible for determining the job inspecting torque as specified in Section 9(b), "Arbitration Inspection," of the RCSC Specification. A separate inspecting torque shall be determined and used for each different rotational capacity lot of fasteners. The procedure described for determining arbitration torque in steps 1 through 9 of the "Arbitration of Disputes Inspection Torque Method-Short Bolts," section of the "Structural Bolting Handbook," published by the Steel Structures Technology Center, Incorporated shall replace Section 9(b)(2) of the RCSC Specification for determining the job inspecting torque for short bolts. Bolt tension shall be checked at locations selected by the Engineer. Work required to perform such inspection shall be done by the Contractor in the presence of the Engineer and in such a manner that the Engineer can read the torque wrench gage or access the DTI gaps during inspection.

Rotational Capacity Testing Prior to Shipment to Job Site.—Rotational capacity tests shall be performed on all lots of high-strength fastener assemblies prior to shipment to the job site. Galvanized assemblies shall be tested as galvanized. One hardened washer shall be used under each nut for the tests.

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

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

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

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

Long Bolt Test Equipment:

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

Long Bolt Test Procedure:

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

Table A

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

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

Table B

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

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

6. Turn the nut to achieve the applicable minimum bolt tension value listed in Table C. After reaching this tension, record the moving torque, in foot-pounds, required to turn the nut, and also record the corresponding bolt tension value in pounds. Torque shall be measured with the nut in motion. Calculate the value, T (in ft-lbs), where T=[(the measured tension in pounds) x (the bolt diameter in inches) / 48 in/ft].

Table C

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

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

Long Bolt Acceptance Criteria:

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

Table D

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

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

Short Bolt Test Equipment:

1. Calibrated dial or digital torque wrench. A torque multiplier may be required for large diameter bolts.
2. Spud wrench or equivalent.
3. Spacer washers or bushings. When spacer washers or bushings are required, they shall have the same inside diameter and equal or larger outside diameter as the appropriate hardened washers conforming to the requirements of ASTM Designation: F436.
4. Steel plate or girder with a hole to install bolt. The hole size shall be 1/16 inch greater than the nominal diameter of the bolt to be tested. The grip length, including any plates, washers, and additional spacers as needed, shall provide the proper number of threads within the grip, as required in Step 2 below.

Short Bolt Test Procedure:

1. Measure the bolt length. The bolt length is defined as the distance from the end of the threaded portion of the shank to the underside of the bolt head.
2. Install the nut on the bolt so that 3 to 5 full threads of the bolt are located between the bearing face of the nut and the underside of the bolt head. Measure and record the thread stickout of the bolt. Thread stickout is determined by measuring the distance from the outer face of the nut to the end of the threaded portion of the shank.
3. Install the bolt into a hole on the plate or girder and install the required number of washers, and additional spacers as needed, between the bearing face of the nut and the underside of the bolt head to produce the thread stickout measured in Step 2.
4. Tighten the nut using a hand wrench to a snug-tight condition. The snug condition shall be the full manual effort applied to the end of a 12 inch long wrench. This applied torque shall not exceed 20 percent of the maximum allowable torque in Table E.

Table E

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

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

Table F

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

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

Table G

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

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

Short Bolt Acceptance Criteria:

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

Installation Tension Testing and Rotational Capacity Testing After Arrival on Job Site.—Installation tension tests and rotational capacity tests on high-strength fastener assemblies shall be performed by the Contractor prior to acceptance or installation, and after arrival of the fastener assemblies on the job-site. The installation tension tests and rotational capacity tests shall be performed at the job-site, in the presence of the Engineer, on each rotational capacity lot of fastener assemblies.

Installation tension tests shall be performed on 3 representative fastener assemblies in conformance with Section 8, "Installation and Tightening," of the RCSC Specification. For short bolts, Section 8(d), "Joint Assembly and Tightening of Slip-Critical and Direct Tension Connections," of the RCSC Specification shall be replaced by the "Pre-Installation Testing Procedures," of the "Structural Bolting Handbook," published by the Steel Structures Technology Center, Incorporated.

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

At the Contractor’s expense, additional installation tension tests, tests required to determine job inspecting torque and rotational capacity tests shall be performed by the Contractor on each rotational capacity lot, in the presence of the Engineer, if 1) any fastener is not used within 3 months after arrival on the jobsite, 2) fasteners are improperly handled, stored, or subjected to inclement weather prior to final tightening, 3) significant changes are noted in original surface condition of threads, washers or nut lubricant or 4) the Contractor's required inspection is not performed within 48 hours after all fasteners in a joint have been tensioned.

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

Countersunk bolts shall be furnished with a suitable nut and washer and conform to the requirements of ASTM Designation: A449. Countersunk bolts shall have heads conforming to dimensions, tolerances and requirements listed in ANSI/ASME B18.3, for hexagonal socket flat countersunk head cap screws, and shall be marked in accordance to the requirements of ASTM Designation: A449. The conical bearing surface of the head shall have a depressed hex slot in the head and shall be free from fins, seams, irregular surfaces which prevent full bearing and other defects affecting their serviceability. When installed the top surface of the head of countersunk bolts shall not project above the adjacent structural steel surface and may be recessed not more than 1/16 inch from the adjacent steel surface.

Steel fasteners designated as on the plans as A 449 shall be tensioned not less than the value shown on the plans. Prior to installation, the Contractor shall submit to the Engineer for approval the methods and equipment to be used to tension steel fasteners designated as ASTM Designation: A 449 in accordance with Section 55-1.02, "Drawings," of the Standard Specifications. Direct tension indicators shall not be used. The plans shall include methods and equipment to be used to evaluate: 1) the presence of a lubricant, 2) the efficiency of the lubricant, and 3) the compatibility of the high strength steel bolt, nut conforming to Supplementary Requirement S1 and S2 in ASTM Designation: A 563 and hardened washer.

Steel fasteners, including bolts and studs, designated on the plans as A 354, Grade BC, shall conform to the requirements of ASTM Designation: A 354, Grade BC. Steel fastener components for steel fasteners designated as A 354, Grade BC shall include a bolt or stud, as shown on the plans, nut and hardened washer. Nuts for steel fasteners designated as A 354, Grade BC shall conform to Section 55-2.01, "Description," of the Standard Specifications. Nuts shall be zinc coated and be furnished with a dry lubricant conforming to Supplementary Requirement S1 and S2 in ASTM Designation: A 563.

Steel fasteners designated on the plans as A 354, Grade BC shall be tensioned not less than the value shown on the plans. Prior to installation, the Contractor shall submit to the Engineer for approval the methods and equipment to be used to tension steel fasteners designated as A354, Grade BC in accordance with Section 55-1.02, "Drawings," of the Standard Specifications. Direct tension indicators shall not be used. The plans shall include methods and equipment to be used to evaluate: 1) the presence of a lubricant, 2) the efficiency of the lubricant, and 3) the compatibility of the high strength steel bolt, nut and hardened washer.

Surface Preparation.—For all bolted connections, the 1) contact surfaces, 2) surfaces of outside members within the grip under bolt heads, nuts and washers and 3) inside surfaces of bolt holes shall be cleaned and coated before assembly in conformance with the provisions for cleaning and painting structural steel of these special provisions.

When zinc-coated fasteners are used, the sheared end of each tension control bolt shall be completely sealed with non-silicone type sealing compound conforming to the provisions in Federal Specification TT-S-230, Type II. The sealant shall be gray in color and shall have a minimum thickness of 50 mils.. The sealant shall be applied to a clean sheared surface on the same day that the splined end is sheared off.

Welding.—The third paragraph of Section 55-3.17, "Welding," of the Standard Specifications is amended to read:

The extent of radiographic testing on groove welds shall be in accordance with the requirements in ANSI/AASHTO/AWS D1.5, Subsection 6.7.1.2. In addition, twenty-five percent of all main member tension groove welds, in material in excess of 1/2 inch thickness, shall be ultrasonically tested.

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

Base Metal Thickness of the Thicker Part Joined, in.	Minimum Partial Joint Penetration Groove Weld Size, in.*
Over 1/4 to 1/2 inclusive	3/16
Over 1/2 to 3/4 inclusive	1/4
Over 3/4 to 1 1/2 inclusive	5/16
Over 1 1/2 to 2 1/4 inclusive	3/8
Over 2 1/4 to 6 inclusive	1/2
Over 6	5/8
*Except the weld size need not exceed the thickness of the thinner part.	

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

Backing for welds that are subject to computed stress which are left in place in the completed structure shall be a single length. Backing shall be of the same material as the structural steel being welded. Single lengths of backing shall be obtained by using a continuous strip, or may consist of lengths of backing joined by full penetration butt welds. Butt welds in the backing material shall be subject to the same kind and frequency of testing as specified for the type of joint in the material being joined. Butt welds in backing material shall be ground flush as necessary to obtain proper inspection and for proper fit-up in the weld joint with which the backing is to be used.

The last three paragraphs in Section 55-3.19, "Bearings and Anchorages," of the Standard Specifications are amended to read:

Mortar to be placed below masonry plates or bearing plates of the bearing assemblies and in anchor bolt sleeves or canisters shall conform to the requirements in Section 51-1.135, "Mortar," of the Standard Specifications except that the proportion of cement to sand shall be one to 3.

The embedded end of anchor bolts shall be either headed or with a nut and washer, and anchor bolts shall be installed with or without either pipe sleeves or corrugated metal canisters, as detailed on the plans. The anchor bolts shall be carefully installed to permit true positioning of the bearing assemblies.

When anchor bolts are installed in pipe sleeves or metal canisters, the pipes or canisters shall be completely filled with mortar. Such mortaring and the construction of mortar pads under masonry plates, if required, shall be done after erection of girders and before placing deck concrete.

Mortar, as shown on the plans, shall conform to the requirements of ASTM Designation: C 1107, Grade B.

Deck expansion joint panels shall be hauled to the East Bay Paint Yard at the SFOBB Toll Plaza and stockpiled. The Contractor shall notify the Engineer a minimum of 2 working days prior to hauling the panels to the Paint Yard.

MEASUREMENT AND PAYMENT

The sixth paragraph in Section 55-4.02, "Payment," of the Standard Specifications is amended to read:

If a portion or all of the welded structural steel is fabricated 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 impracticable and extremely difficult to ascertain and determine the actual increase in such expenses, it is agreed that payment to the Contractor for furnishing said structural steel from each fabrication site located more than 300 air line miles from both Sacramento and Los Angeles will be reduced $5,000 or by an amount computed at $0.020 per pound of structural steel fabricated, whichever is greater, or in the case of each fabrication site located more than 3,000 air line miles from both Sacramento and Los Angeles, payment will be reduced $8,000 or by $0.036 per pound of structural steel fabricated, whichever is greater.

Pay quantities for structural steel will be measured and paid with deductions for perforations in structural steel plates.

If a portion of or all check samples are removed at a mill more than 480 air line kilometers from both Sacramento and Los Angeles, shop inspection expenses will be sustained by the State which are in addition to expenses incurred for fabrication site inspection. Payment to the Contractor for furnishing structural steel will be reduced $2,000 for each mill located more than 480 air line kilometers from both Sacramento and Los Angeles.

Full compensation for plate washers, erection bolts, drilling and coring existing steel, coring existing concrete, carbon equivalency testing repair methods and remedial work as required, prestressing structural steel as shown on the plans, and for mortaring spaces and recesses in and between structural steel members shall be considered as included in the contract price paid per pound for erect structural steel, (bridge) and no separate payment will be allowed therefor.

10-1.35 REMOVE AND ERECT STRUCTURAL STEEL

Erecting structural steel shall conform to the requirements in Section 55, "Steel Structures," of the Standard Specifications, "Order of Work" and "Maintaining Traffic" elsewhere in these special provisions and these special provisions. Removing structural steel shall conform to the requirements in "Bridge Removal (Portion)" elsewhere in these special provisions and these special provisions.

Exposed surfaces of new and existing metal surfaces and connections to existing steel shall be cleaned and painted in accordance with the provisions of "Clean and Paint Structural Steel" elsewhere in these special provisions.

Approval by the Engineer of the plans or field inspection performed by the Engineer will in no way relieve the Contractor of full responsibility for the structural steel erection and removal plan and procedure.

STRUCTURAL STEEL ERECTION AND REMOVAL DRAWINGS.--The Contractor shall submit a complete structural steel erection and removal plan to the Engineer detailing methods, procedures, features and sequences to erect and remove structural steel in a safe and controlled manner. Such drawings shall be prepared by an engineer who is registered as a Civil Engineer in the State of California.

The structural steel erection and removal plan shall conform to the requirements in Section--55-1.02, "Plans and Working Drawings," of the Standard Specifications.

The time to be provided for the Engineer's review of the working drawings for structural steel erection or removal of portions specific structures shall be as follows:

Structure or Portion of Structure	Review Time - Weeks
Continuous truss	12 weeks
Towers W2 - W6	10 weeks
all other locations	10 weeks

In the event that several portions of the erection and removal plans are submitted simultaneously, or an additional plan is submitted for review before the review of a previously submitted plan has been completed, the Contractor shall designate the sequence in which the plans are to be reviewed. In such event, the time to be provided for the review of

any plan in the sequence shall be not less than the review time specified above for that plan, plus two weeks for each plan of higher priority which is still under review.

For structural steel erection or removal over railroads, approval by the Engineer of the structural steel erection and removal plans will be contingent upon the drawings being satisfactory to the railroad company involved.

The structural steel erection and removal plan shall include the following:

The structural steel erection and removal sequence for the entire structure, including individual activities, and the anticipated time required to perform each activity;Contingency plans to be implemented in the event of schedule overruns, equipment failure or inclement weather;

Methods of handling, hoisting and supporting structural steel members;

Equipment locations on the structure during structural steel erection or removal operations and the anticipated loads to be applied to the structure;

Manufacturer product information for any hoisting equipment, rigging, manufactured assemblies or wind monitoring equipment to be used;

Working drawings and calculations for any fabricated items or assemblies;

Additional temporary bracing;

Locations where work is to be performed over or within a horizontal distance of 20 feet from traffic or railroad property;Locations where protective barriers are to be used;

Proposed lane closures or other traffic closures; and

Details and locations of any proposed attachments to the structure to facilitate structural steel erection or removal.

Protective barriers shall conform to "Protective Barriers" elsewhere in these special provisions.

Manufactured assemblies and additional temporary bracing as required shall be designed and constructed in conformance with the provisions in Section 51-1.06, "Falsework," of the Standard Specifications and the following:

The assumed horizontal load to be resisted by the temporary bracing for structural steel erection and removal operations only, shall be the sum of the actual horizontal loads due to equipment, construction sequence or other causes and an allowance for wind, but in no case shall the assumed horizontal load to be resisted in any direction be less than 10 percent of the total dead load of the structure and equipment to be removed.

Two wind monitoring systems shall be used during all structural steel erection or removal operations. The wind monitoring equipment shall be delivered to the Engineer after approval of the structural steel erection and removal plan.

Each wind monitoring system shall have the capability to 1) measure the wind speed, 2) determine the wind direction, 3) record wind data, 4) calculate maximum and fastest mile wind speeds, 5) notify multiple pager numbers when alarm has been activated, and shall have the following features:

1) range of 0 mph to 100 mph, with a maximum accuracy and starting threshold of 1 mph;
2) operating temperature range of -10° to 100° F;
3) resistance to rain and moisture;
4) adjustable alarm to indicate when maximum wind speed and fastest mile wind speed have been exceeded;
5) PC compatible software to interpret the data; and
6) modem to transmit data over standard phone lines.

Prior to the anticipated fastest mile wind speed exceeding 35 mph, the Contractor shall cease all erection or removal operations on the structure and immediately replace any structural steel members that have been removed during the erection or removal operation. Any bolts or rivets removed during these operations that have not been replaced with the bolts shown on the plans, shall be temporarily replaced with erection bolts. Replacement of the members and the installation of bolts or erections shall be completed when the anticipated fastest mile wind speed exceeds 35 mph. When the anticipated fastest mile wind speed decreases to below 35 mph, the Contractor may resume erection or removal operations.

SPECIAL LOCATIONS.--The following additional requirements apply to the structural steel erection or removal that is over or adjacent to roadways that may be closed to public traffic for only brief periods of time:

The closure of roadways to public traffic shall conform to the requirements under "Order of Work" and "Maintaining Traffic" of these special provisions.

Prior to closing a roadway to traffic to accommodate structural steel erection or removal operations, the Contractor shall have all necessary men, materials and equipment at the site as needed to proceed with the removal work in an expeditious manner. While the roadway is closed to traffic, work shall be pursued promptly and without interruption until the roadway is reopened to public traffic.

Additional temporary bracing shall not encroach closer than 8 feet horizontally from the edge or 15 feet vertically above any traffic lane or shoulder that is open to traffic.

A hoisting system shall be used during structural steel erection or removal. The hoisting system shall prevent free fall or unanticipated release of the load.

The hoisting system shall conform to the requirements under "Order of Work" and "Maintaining Traffic" of these special provisions.

All loads not secured to the structure shall be supported at all times by a minimum of two independent hoisting systems or load lines, each having the capacity of supporting the entire load. Each hoisting system shall be equipped with brakes or safety devices capable of promptly stopping and holding the entire load. The brakes shall be self-activating in the event of power or mechanical failure. The safety devices shall be activated by a positive means in the event of wire or rope failure.

Hoisting devices may be placed on or attached to the existing structure. Welding to the existing structure will not be allowed.

At the option of the Contractor, lifting attachments may be welded or bolted to structural steel plate to assist in hoisting the load. Such attachments shall not interfere with the holes shown on the plans.

Attention is directed to "Welding Quality Control" elsewhere in these special provisions.

After placing, any lifting attachments shall be removed. All remaining welds shall be ground flush and any damaged areas shall be repaired in accordance with the requirements of ANSI/AASHTO/AWS D1.5. Any areas of damaged paint shall be painted as directed in "Clean and Paint Structural Steel" elsewhere in these special provisions.

Prior to proceeding with structural steel erection or removal, an engineer for the Contractor who is registered as a Civil Engineer in the State of California and has a minimum of four years experience in structural steel construction, shall inspect the hoisting system and lifting attachments, for conformity with the working drawings. The Contractor's registered engineer shall certify in writing that the hoisting system and lifting attachments substantially conform to the details on the working drawings, and that the material and workmanship are satisfactory for the purpose intended. A copy of this certification shall be available at the site of the work at all times.

The Contractor's registered engineer shall be present at the bridge site when structural erection and removal operations occur when the bridge is closed for brief periods. The Contractor's registered engineer shall inspect the structural steel erection or removal operation and report in writing on a daily basis the progress of the operation. A copy of the daily report shall be submitted to the Engineer and available at the site of the work at all times. Should an unplanned event occur, the Contractor's registered engineer shall submit immediately to the Engineer for approval, the procedure of operation proposed to correct or remedy the occurrence.

PAYMENT.--Full compensation for the structural steel erection and removal plan, including temporary bracing systems , protective barriers, wind monitoring system, hoisting systems and the Contractor's registered engineer, shall be considered as included in the contract price paid per pound for erect structural steel, bridge and no separate payment will be allowed therefor.

10-1.36 WIRE CABLE WRAPPING

This work shall consist of removing existing wire cable and installing wire cable wrapping in accordance with the details shown on the plans, the provisions in “Steel Structures,” of the Standard Specifications and these special provisions.

Wire cable wrapping shall consist of placing red lead paste on all exposed cable surfaces and placing wire wrapping.

MATERIALS.--Wire for wrapping the cables shall be 0.148 inch diameter carbon steel wire, conforming to the requirements of ASTM Designation: A 641, Class A, soft temper.

Red lead paste shall be a mixture of 100 pounds dry lead, conforming to the requirements of ASTM Designation D 83, 97 percent grade and 8-1/2 pounds of raw linseed oil conforming to the requirements of ASTM Designation D 234. Red lead paste shall have a consistency of thick oily paste.Red lead paste shall be premixed by the manufacturer and

shipped to the job site in sealed one gallon containers. The containers shall be clearly labeled to indicate the hazardous nature of the contents. The supply of red lead paste on the job site at any one time shall not exceed the quantity to be used in one calendar month. All unused red lead paste shall remain the property of the Contractor and shall be disposed of as provided in Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications.

Red lead paste that separates in transit or in storage shall be carefully mixed on-site in such a manner as to prevent any spillage.

All work involving new or existing red lead paste shall be performed in accordance with the requirements for disturbing existing paint systems in “Existing Highway Facilities” elsewhere in these special provisions except that “Work Area Monitoring” is not required for the application of the red lead paste.

The manufacturer shall furnish certificates of compliance in accordance with Section 6-1.07, “Certificates of Compliance,” of the Standard Specifications for all material used.

CONSTRUCTION.--The Contractor shall protect unwrapped portions of the main cables against weathering at all times when work is not in progress by methods approved by the Engineer. The Contractor shall keep the main cable compressed and prevent the existing wire wrapping from loosening beyond the limits for removal shown on the plans.

The exposed main cable shall be coated with red lead paste prior to placing the wire cable wrapping and the cable bands. The Contractor shall notify the Engineer in writing at least 3 working days but no more than 14 calendar days prior to placing the red lead paste on the exposed main cable.The exposed main cable will be inspected by the State prior to the application of the red lead paste at each location. This inspection will be completed within 14 working days as defined in Section 8-1.06, “Time Completion,” of the Standard Specifications, after the wire cable wrapping has been removed.

The wrapping devices, materials and equipment necessary to complete the work shall be packaged, handled and transported in a manner which will ensure that they will be suitable for the work.

Prior to the wire wrapping or placing cable bands, the exposed main cable surface shall be completely coated with red lead paste. The paste shall be of uniform thickness and cover 100 percent of the exposed cable surfaces. The paste shall be applied at a thickness that is sufficient to completely fill all voids between main cable wires and wrapping wires or cable bands. The thickness of the paste shall be closely controlled during application to minimize the quantity of excess paste that will migrate to outside surface of the wire wrapping as a result of the wire wrapping procedure.

The installation of the wire cable wrapping shall be done within a maximum of two hours after the red lead paste is applied around the outer surface of the main cable. At the end of each working day, all portions of the red lead paste covered main cables shall be completely wrapped.

The wrapping shall extend into the caulking grooves in the ends of the collar bands or the cable bands, and the ends of the wire shall be securely fastened to the band bolts to prevent loosening of the wire wrapping.

After the installation of the wire cable wrapping, all red lead paste on the outer surface shall be carefully wiped off leaving no visible trace of red lead on the wrapping wire.

TEST SECTION.--A test section of the wire cable wrapping shall be successfully completed at a location approved by the Engineer before beginning work on the remaining areas to be wrapped. The test section approved by the Engineer shall be used as the standard of comparison in determining the acceptability of the wire cable wrapping.

MEASUREMENT.--Measurement for the wire cable wrapping, including application and disposal of red lead paste, shall be per linear foot of main cable completely wrapped with new wire cable wrapping.

10-1.37 CABLE BANDS

The construction of cable bands shall conform to the details shown on the plans and to the provisions in Section 55, “Steel Structures,” of the Standard Specifications, Section 75, "Miscellaneous Metal," and these special provisions.

Cable bands shall include cable bands, eyebars, steel plates and high strength fasteners.

Red lead paste shall be furnished, applied, handled, and excess disposed of in accordance with the procedures specified in “Wire Cable Wrapping,” elsewhere in these special provisions.

The Contractor shall retighten the cable band bolts after all cable bands have been installed.

MATERIALS.--Materials for the cable bands including cable saddle extension shall conform to the requirements of ASTM Designation: A148 Grade 80-50.

Caulking material shall conform to the requirements of ASTM Designation: C920 Type S, Grade NS, Class 25.

Shop drawings shall include the name of the fabricator of the castings, manufacture information for spherical bearings, and the sequence for the installation of cable bands.

Spherical bearings shall be fabricated from stainless steel and be constructed with a single seal. Material for the spherical bearings shall conform to the requirements of ASTM Designation: A316. Spherical bearings shall accommodate a minimum 5 degree transverse rotation without damage to the device.

Cable tie pins and nuts shall be galvanized.

MEASUREMENT.--Cable bands will be measured by the unit from the actual count of cable bands installed. A unit shall consists of all portions of cable bands placed between two adjacent cable suspender assemblies.

PAYMENT.--The contract unit price paid for cable bands shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals and for doing all the work involved in the furnishing and installing of the cable bands, including eyebars, steel plates, high strength fasteners, spherical bearings, cable tie pins, nuts and retightening of the bolts, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

10-1.38 ZINC METALLIZING

The inside surface of the cable bands shall be coated with zinc metallizing in accordance with the details shown on the plans and these special provisions.

The surface shall be steam cleaned in accordance with the provisions of Surface Preparation Specification No. 1, "Solvent Cleaning," including the commentary for steam cleaning, of the Steel Structures Painting Council.

Surface irregularities, including sharp edges, cracks delaminations, and pits, interfering with the performance of the coating shall be removed by grinding or other suitable means.

The surface shall be dry blast cleaned in accordance with the provisions of Surface Preparation Specification No. 10, "Near-White Blast Cleaning," of the Steel Structures Painting Council. Blast cleaning shall leave all surfaces with a dense, uniform, angular, anchor pattern of no less than 1 1/2 mils as measured in accordance with ASTM Designation: D4417.

The coating material shall be zinc alloy wire of minimum of 99.9 percent purity and conform to Military Specification: MIL-W-6712, "Wire, Metallizing." The Contractor shall have an independent laboratory certify the purity of all zinc wire to be used on this project and list the percentage of each impurity. The Contractor shall obtain certification and submit the laboratory test results to the Engineer for each lot of zinc used before the application of zinc.

The zinc metallizing shall be applied prior to shipment to the jobsite. Zinc metallizing shall not be applied when the atmospheric or surface temperature is less than 70° F nor when the relative humidity exceeds 60 percent. The zinc metallizing shall not be applied to a surface which shows any sign of surface moisture.

Application equipment shall be electric-arc or oxyacetylene flame spray type. Compress air used for spraying shall be clean, oil-free and dry in accordance with ASTM Designation: D4285. Air line filters and moisture separators shall be installed upstream from the spraying equipment.

At least one layer of zinc metallizing shall be applied within 4 hours of blasting and before any rusting has occurred on the surface. Any contamination between layers must be removed by the Contractor, at the his expense, in accordance with the material supplier's written instructions before any additional material is applied.

At least 15 working days prior to applying the zinc metallizing to the cable bands, the Contractor shall submit a test specimen at least 2 ft x 2 ft x 0.25 in. The testing shall be performed at an independent testing facility approved by the Engineer. A copy of the test results shall be furnished to the Engineer within 5 working days following completion of testing.

The zinc metallizing shall pass all of the following tests:

1. Visual test: Surfaces shall be visually inspected using a lens with a magnification of 10. To be acceptable, the zinc metallizing shall have uniform appearance and follow the form of the steel surface. The zinc metallizing shall not contain any lumps, blisters, coarse texture or loosely adhering particles, nor shall it contain any cracks, pinholes, chips or other defects which expose the steel surface.

2. Adhesion test: Three aluminum or steel discs shall be cemented to the test specimen. After curing and within 48 hours of the zinc metallizing application, the test discs shall be pulled with a calibrated Proceq, Model DYNA Z5, or equal. The procedure and test equipment provided by Proceq shall be used for calibration, except that pre-scoring the zinc metallizing around the test disc will not be required. The minimum adhesion strength shall be 150 psi or greater.

3. Thickness test: The total thickness of the zinc metallizing shall be not less than 10 mils nor more than 14 mils over the entire surface. The thickness of zinc metallizing shall be measured in place with a calibrated magnetic film

thickness gage in accordance with the provisions of Paint Application Specification No. 2, "Measurement of Dry Paint Thickness with Magnetic Gages," Steel Structures Painting Council. Uniform gun movement shall be used to ensure uniform thickness.

All test specimens shall become the property of the Contractor and shall be disposed of as provided in Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications.

At least 20 percent, but no fewer than 2 cable bands shall be tested by the independent laboratory prior to shipment to the jobsite. If the adhesion test cannot be conducted on the inside surface of the cable bands, the test shall be conducted on a test panel having the same thickness as the cable band, thermally sprayed with the same equipment at the same time and under the same conditions as the cable bands.

Any damage to the coating resulting from testing shall be dry blast cleaned and zinc metallizing reapplied as specified herein. A copy of the test results shall be furnished to and approved by the Engineer prior to shipment of the cable bands to the jobsite.

Any cable bands delivered to the jobsite with visible damage to the zinc metallizing caused by shipping, handling or installation will be rejected.

Full compensation for zinc metallizing shall be considered as included in the contract unit price paid for cable bands and no separate payment will be allowed therefor.

10-1.39 CLEAN AND PAINT STRUCTURAL STEEL

Exposed new metal surfaces and connections to existing steel shall be cleaned and painted in conformance with the provisions in Sections 59-2, "Painting Structural Steel," and 91, "Paint," of the Standard Specifications and these special provisions.

Additional cleaning and painting outside of the limits designated herein, shall be done as directed by the Engineer and will be paid for as extra work as provided in Section 4-1.03D of the Standard Specifications.

All debris produced when the existing paint system is disturbed shall be contained as specified in "Existing Highway Facilities" elsewhere in these special provisions.

The Contractor shall provide suitable enclosures to permit cleaning and painting during inclement weather. Provisions shall be made to artificially control atmospheric conditions inside the enclosures within limits suitable for cleaning throughout the cleaning operation, painting throughout the painting operation, and for the drying period in accordance with ASTM designation: D 1640. Full compensation for providing and maintaining such enclosures shall be considered as included in the prices paid for the various contract items of work requiring paint and no additional compensation will be allowed therefor.

No extension of contract time will be granted as a result of temperature or humidity which exceeds the limits for cleaning or painting designated herein, except as approved by the Engineer.

The fifth paragraph in Section 59-1.03, "Application," of the Standard Specifications is amended to read:

> Unless otherwise specified, should 7 days elapse between paint applications, the painted surface shall be water rinsed prior to the next paint application. Water rinsing is defined as a pressurized water rinse with a minimum nozzle pressure of 1200 psi . During rinsing, the tip of the pressure nozzle shall be placed between 12 inches and 18 inches from the surface to be rinsed. The nozzle shall have a maximum fan tip angle of 30°.

Fresh water shall be used for water rinsing operations. Water from water rinsing operations shall not be permitted to fall into the bay, or on public traffic, to flow across shoulders or lanes occupied by public traffic, or to flow into gutter or other drainage facilities.

The ninth paragraph in Section 59-1.03, "Application," of the Standard Specifications is amended to read:

> Runs, sags, thin and excessively thick areas in the paint film, skips and holidays, or areas of non-uniform appearance shall be considered as evidence that the work is unsatisfactory, and the Contractor may be required to blast clean the areas and reapply the paint.

The second paragraph in Section 59-2.01, "General," of the Standard Specifications is amended to read:

> All exposed surfaces of structural steel and other metals, including inside surfaces of bolt holes when required, except galvanized or metalized surfaces, shall be cleaned and painted.

The first subparagraph of the first paragraph in Section 59-2.12, "Painting," of the Standard Specifications is amended to read:

Structures, other than sign structures, shall be blast cleaned and painted with the total thickness of undercoats before erection. Finish coats and final coats shall be applied after erection. If concrete deck is to be placed on a steel member to be painted, finish coats and final coats shall be applied after concrete deck placement. After erection and deck placement, but before applying subsequent paint, areas where paint has been damaged or has deteriorated and exposed unpainted surfaces shall be thoroughly cleaned, foreign substances shall be removed, and surfaces shall be spot painted with undercoats to the specified thickness. Damaged areas of undercoat paint shall be blast cleaned and painted as specified in the special provisions.

The third paragraph in Section 59-2.12, "Painting," of the Standard Specifications is amended to read:

Contact surfaces of stiffeners, railings, built up members, or any open seam exceeding 6 mils in width that would retain moisture, shall be caulked with non-silicone, chemically-curing type sealing compound conforming to the provisions in Federal Specification TT-S-230, Type II, or other approved material. The sealing compound shall be applied no sooner than 72 hours after the last application of undercoat. The sealing compound shall be allowed to cure as recommended by the manufacturer prior to water rinsing and application of the first finish coat. When no finish coats are applied, the sealing compound shall be gray in color.

The fourth paragraph in Section 59-2.12, "Painting," of the Standard Specifications is amended to read:

The dry film thickness of the paint will be measured in place with a calibrated Type 2 magnetic film thickness gauge in conformance with the requirements of Steel Structure Painting Council Specification SSPC-PA2.

The existing paint systems consist of materials listed in "Existing Highway Facilities" of these special provisions.

CLEANING

New metal surfaces and existing wind tongue connections as shown on the plans, except where galvanized, shall be dry blast cleaned in conformance with the provisions of Surface Preparation Specification No. 10, "Near White Blast Cleaning," of the Steel Structures Painting Council. Blast cleaning shall leave surfaces with a dense, uniform, angular anchor pattern of no less than 1 1/2 mils as measured in conformance with the requirements of ASTM Designation: D 4417.

Areas of existing steel to the limits specified herein, except where galvanized, shall be water rinsed in conformance with the provisions in Section 59-1.03, "Application," of the Standard Specifications and dry spot blast cleaned in conformance with the provisions of Surface Preparation Specification No. 6, "Commercial Blast Cleaning," of the Steel Structures Painting Council. Blast cleaning shall leave surfaces with a dense, uniform, angular anchor pattern of no less than 1 mil as measured in conformance with the requirements of ASTM Designation: D 4417.

The areas of existing steel to be dry spot blast cleaned shall consist of, as a minimum: (1) contact surfaces of structural steel connections, (2) member surfaces under bolt heads, nuts or washers of all new high-strength bolted connections (3) exposed bare surfaces of existing steel remaining after trimming, cutting, drilling or reaming, (4) all areas of existing steel within a 4-inch radius measured in any direction from the of point of application of heat for welding or flame cutting and (5) all areas within 4 inches square of the centerline of rivets or bolts to be removed. Inside surfaces of tower saddle castings, tower side gussets and tower center gussets shall be dry spot blast cleaned.

Dry spot blast cleaning of the inside of holes remaining after rivet removal, enclosed tower legs and enclosed cells will not be required.

Enclosed cells shall be defined as chords, as designated on the plans, enclosed on 4 sides with solid steel plate from panel point to panel point.

A report titled "Survey of Existing Paint Thickness," 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.

Abrasives used for blast cleaning existing steel shall conform to the requirements of Abrasive Specification No. 1, "Mineral and Slag Abrasives," of the Steel Structures Painting Council and shall not contain hazardous material. Silica sand abrasives, if used, shall be Class A as defined therein.

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 except silica sand to be used for existing steel.

The inside surfaces of bolt holes shall be cleaned in conformance with the provisions of Surface Preparation Specification No. 1, "Solvent Cleaning," of the Steel Structures Painting Council, and visible rust shall be removed.

All exposed galvanized surfaces shall be prepared and painted in accordance with Section 59-3, "Painting Galvanized Surfaces," of the Standard Specifications and these special provisions, except that the abrasive blast and pre-treatment of vinyl wash primer will not be required. Exposed galvanized surfaces shall be roughened by sanding with 120-grit sandpaper or equivalent. Surface roughening shall not remove galvanizing.

PAINTING

Blast cleaned new metal surfaces and existing wind tongue connections dry blast cleaned in accordance with the provisions of Surface Preparation Specification No. 10. shall receive a single undercoat consisting of a waterborne inorganic zinc coating conforming to the provisions of AASHTO Designation M 300, Type II, except that: 1) the first 3 sentences of Section 4.7, "Primer Field Performance Requirements," and the entire Section 4.7.1 shall not apply, and 2) zinc dust shall be Type II in conformance with ASTM Designation: D 520. The inorganic zinc coating shall be listed on the qualified products list which may be obtained from the Transportation Laboratory.

Inorganic zinc coating shall be used within 12 hours of initial mixing.

Application of inorganic zinc coating shall conform to provisions for applying zinc-rich coating in Section 59-2.13, "Application of Zinc-Rich Primer," of the Standard Specifications.

Inorganic zinc coating shall not be applied when the atmospheric or surface temperature is less than 45°F nor more than 85°F, nor when the relative humidity exceeds 85 percent.

The single undercoat of inorganic zinc coating shall be applied to the required dry film thickness in 2 or more applications within 4 hours after blast cleaning.

The total dry film thickness of all applications of the single undercoat of inorganic zinc coating shall be not less than 4 mils nor more than 8 mils, except that the total dry film thickness on each contact surface of high strength bolted connections, including the surfaces of outside existing members within the grip under bolt heads, nuts and washers, shall be between 1 mil and 4 mils and may be applied in one application.

Areas where mudcracking occurs in the inorganic zinc coating shall be blast cleaned and repainted with inorganic zinc coating to the specified thickness.

The inorganic zinc coating shall be tested for adhesion and cure. The locations of the tests will be determined by the Engineer. The sequence of the testing operations shall be determined by the Contractor. The testing for adhesion and cure will be performed no sooner than 72 hours after application of the single undercoat of inorganic zinc coating. At the Contractor's expense, satisfactory access shall be provided to allow the Engineer to determine the location of the tests and to test the inorganic zinc coating cure. The inorganic zinc coating shall pass both of the following tests:

The inorganic zinc coating shall have a minimum adhesion to steel of 600 psi when measured at no more than 6 locations per connection or member using a self-aligning adhesion tester in conformance with the requirements in ASTM Designation: D 4541. The Contractor, at the Contractor's expense, shall: (1) verify compliance with the adhesion requirements, (2) furnish test results to the Engineer, and (3) repair the coating after testing.

The inorganic zinc coating shall exhibit a solid, hard and polished metal surface when firmly scraped with the knurled edge of a quarter. Inorganic zinc coating that is powdery, soft or does not exhibit a polished metal surface, as determined by the Engineer, shall be repaired by the Contractor, at the Contractor's expense, by blast cleaning and repainting with inorganic zinc coating to the specified thickness.

Except as approved by the Engineer, a minimum curing time of 72 hours shall be allowed between application of inorganic zinc coating and water rinsing.

Exposed areas of inorganic zinc coating shall be thoroughly water rinsedin conformance with the provisions in Section 59-1.03, "Application," of the Standard Specifications.

Blast cleaned existing metal surfaces and areas exposed by rivet, bolt or bridge removal not blast cleaned shall receive the following undercoat paint system. The phenolic type undercoats shall be listed on the qualified products list which may be obtained from the Transportation Laboratory, (916) 227-7000.

The first undercoat, conforming to the requirements for Red Primer, High Solids Phenolic Type, Formula PB-201B, shall be applied in one or more applications to a dry film thickness of not less than 2 mils.

The second undercoat, conforming to the requirements for Pink Primer High Solids Phenolic Type Formula PB-202B, shall be applied in one or more applications to a dry film thickness of not less than 2 mils.

Application of phenolic type undercoats will not be permitted when the relative humidity exceeds 90 percent.

Phenolic type undercoats shall be applied by brush, daubers or rollers.

The first undercoat shall be applied to the required dry film thickness within 4 hours after blast cleaning.

Except as approved by the Engineer, a minimum drying time of 12 hours shall be allowed between the application of the first and second undercoats.

The second undercoat is not required for existing steel contact surfaces of structural steel connections and existing contact surfaces under bolt heads, nuts or washers of all high-strength bolted connections. Except as approved by the Engineer or otherwise specified, a minimum drying time of 1 hour shall be allowed between the application of the first phenolic type undercoat and the erection of structural steel to the structural steel connection. High strength bolts may be installed immediately after the application of the first phenolic type undercoat.

The total dry film thickness of undercoats, except those surfaces with only the first undercoat, shall be not less than 4 mils nor more than 8 mils.

Exposed areas of phenolic type undercoating shall be thoroughly water rinsed in conformance with the provisions in Section 59-1.03, "Application," of the Standard Specifications. Except as approved by the Engineer, a minimum drying time of 72 hours shall be allowed between application of second undercoat and water rinsing.

The first finish coat shall be applied within 48 hours following the water rinsing.

All exposed areas of inorganic zinc coating, phenolic undercoating and galvanized surfaces shall receive the following finish coats:

The first finish coat, conforming to the requirements for Non-Leafing Aluminum Finish Paint-Waterborne Acrylic Latex, Formula PWB-159D, shall be applied in one or more applications to a dry film thickness of not less than 2 mils.

The second finish coat, conforming to the requirements for Leafing Aluminum Finish Paint-Waterborne Acrylic Latex, Formula PWB-160D, shall be applied in one or more applications to a dry film thickness of not less than 2 mils.

Application of finish coats will not be permitted when the relative humidity exceeds 80 percent.

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

The total dry film thickness of all applications of inorganic zinc coating and finish coat paint shall be not less than 8 mils nor more than 16 mils .

MEASUREMENT AND PAYMENT

Dry spot blast cleaning and undercoat painting areas of existing surfaces will be measured in accordance with the limits specified herein and will be paid for as spot blast clean and paint undercoat.

The contract price paid per square foot for spot blast clean and paint undercoat shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in dry spot blast cleaning and painting undercoat on the existing surfaces 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 clean and paint structural steel shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in cleaning and painting the surfaces of the new structural steel galvanized surfaces and finish coats on undercoated areas of existing metal, complete in place, including water rinsing, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

10-1.40 MISCELLANEOUS METAL (BRIDGE)

Miscellaneous metal (bridge) shall conform to the provisions for miscellaneous bridge metal in Section 75, "Miscellaneous Metal," of the Standard Specifications and these special provisions.

Attention is directed to “Welding Quality Control” elsewhere in these special provisions.

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

high strength rods and studs

ladder at Pier W4
bronze plate for anchorage girder

Steel fasteners using high-strength rods and studs shall conform to the provisions for steel fasteners and for bolted connections in Section 55, "Steel Structures," of the Standard Specifications and in "Steel Structures" elsewhere in these special provisions.

Bronze plates for anchorage girder shall conform to the requirements of ASTM Designation: B22, Bronze Alloy C86300.

An approved thread locking system, consisting of a cleaner, primer and anaerobic adhesive, shall be applied where shown on the plans. Lubricants and foreign materials shall be removed from the threaded areas of both parts using the cleaner and small wire brush. The primer shall be applied to cover the threaded areas of both parts. The anaerobic adhesive shall be applied to fill the male threads in the area of the final position of the nut. The nut shall be installed at the location or to the torque shown on the plans, and an additional fillet of anaerobic adhesive shall be applied completely around the exposed junctions of the nut and male part. Full compensation for furnishing and applying the thread locking system shall be considered as included in the contract price paid for the item of work requiring the system and no separate payment will be made therefor.

The third subparagraph of the second paragraph of Section 75-1.03, "Miscellaneous Bridge Metal," of the Standard Specifications is amended to read:

3. Manhole frames and covers, frames and grates, ladder rungs, guard posts, and access door assemblies.

The third subparagraph of the eleventh paragraph of Section 75-1.03, "Miscellaneous Bridge Metal," of the Standard Specifications is amended to read:

Cast-in-place inserts shall be ferrule loop or cast iron type.

All metal parts of anchorage devices shall be fabricated from steel, except iron castings for cast-in-place inserts shall be malleable iron or ductile iron.

All metal parts of anchorage devices, except mechanical expansion anchors and iron castings for cast-in-place inserts, shall be hot-dip or mechanically galvanized. Mechanical expansion anchors may be hot-dip or mechanically galvanized, made from stainless steel, or coated with electrodeposited zinc conforming to the requirements of ASTM Designation: B 633. Iron castings shall be mechanically galvanized.

The second paragraph in Section 75-1.06, "Measurement," of the Standards Specifications is amended to read:

Scale weights will not be required when miscellaneous iron and steel, miscellaneous bridge metal, miscellaneous metal (restrainer), or pumping plant metal work are designated as final pay items in the Engineer's Estimate.

10-1.41 INSTALL SEISMIC MONITORING CASING

Install seismic monitoring casing shall consist of drilling into soil and rock, sampling soil and rock, providing a log of test borings and a boring report, and furnishing and installing casing for seismic monitoring equipment at the downhole locations shown on the plans in the vicinity of the State maintenance yard near Bent A. Seismic monitoring casing shall be in accordance with the details shown on the plans and these special provisions.

Install seismic monitoring casing includes the following operations in the following order:

1. Drill 3-inch diameter hole, perform Standard Penetration Tests (SPT) and collect rock cores, and prepare a log of test borings and boring report.
2. Allow State forces to perform P-S suspension logging.
3. Drill 8-inch diameter hole for installation of casing.
4. Furnish and install 4-inch diameter polyvinyl chloride (PVC) pipe casing, including equipment furnished and attached to the bottom of the casing by the State.
5. Grout the annulus between the 8-inch diameter hole and the 4-inch diameter casing, and install covers.

MATERIALS.--The seismic monitoring casing shall consist of 4-inch diameter Schedule 80 screw joint (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 and installed by State forces.

Grout for placement in the annular space between the casing and the hole shall be proportioned as follows:

Grout Type	Elevation in Hole	Grout Proportion
A	The bottom 35 feet.	2 sacks of cement and 1 sack of bentonite per 60 gallons of water.
B	Up from 35 above the bottom.	12 sacks of cement, and 1 sack of bentonite per 80 gallons of water.

The Contractor shall furnish sufficient quantities of grout for filling the annular space between the casing and the hole.

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 Manual” 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 10 working days in advance of drilling borings.

All borings shall be made under the site supervision of, the log of test borings stamped by, and the test boring submittal signed by a Geologist or Civil Engineer 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 and shall be at least 3 inches in diameter.

Borings shall be drilled to a depth equal to that of the deepest hole at the downhole location.

Standard Penetration Tests (SPT) shall be made in all soil types and performed in accordance with ASTM D1586 in each test boring at 2.5 foot maximum intervals and terminate when bedrock is encountered. Soil classification and descriptions shall conform to the requirements for visual-manual procedures in ASTM D 2488.

Bedrock shall be continuously cored with at least 90% core recovery. Rock shall not be logged from drill cuttings. Rock quality designation (RQD) shall be made taken at 5 foot maximum intervals. Rock shall be cored using an outer and inner core barrel drilling system. The outer core barrel shall be fitted with either a diamond impregnated or polycrystalline drill bit and have an outside diameter of at least 3 inches. The split inner tube core barrel shall have an inside diameter of at least 2 inches.

Prior to removal from the split inner tube barrels and placement into core boxes, rock cores shall be photographed. After core boxes are filled, and prior to removal from the drilling platform, rock cores shall be photographed. All rock core photographs shall be color, 5″ x 7″, and labeled with the borehole number, sample elevation, scale, and date and time photographed.

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

The log of test borings including the soil and rock classification shall conform to the document “Soil and Rock Logging Classification Manual: Field Manual,” published by the Engineering Service Center, Caltrans, dated August 1995.

After completion of all borings, the Contractor shall furnish to the Engineer a test boring submittal that includes photographs of rock cores, 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 60 pound (minimum) 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).

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. SPT data.
10. Depth increments of borings.
11. Graphic log.
12. Soil classifications and descriptions.
13. Rock classifications and descriptions.
14. Log symbol legend.
15. 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 rock cores.
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. The Contractor shall notify the Engineer in writing not less than 5 working days prior to completing boring, sampling, and logging operations in order for the State forces to be on site to perform P-S suspension logging. The Contractor shall allow 3 working days for the State forces to complete P-S suspension logging.

INSTALL CASING.--The seismic monitoring casing shall be installed into an 8-inch diameter hole. The hole shall be drilled by mud rotary methods and shall be centered over the 3-inch diameter hole described in the section “Borings” in these special provisions.

The 4-inch diameter pipe casing shall be installed from the ground surface to the depth as shown on the plans. The Contractor shall notify the Engineer in writing not less than 15 working days prior to installing the casings in order for personnel from the California Division of Mines and Geology (CDMG) to attach the Bishops Hat to the casing and extend instrumentation cables through the casing. CDMG personnel will be on site for the installation and grouting of the casings.

Grouting of the annular space between the casing and the hole shall be done in multiple lifts. 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 feet of grout has been placed, the tips of grout delivery tubes shall be within 6 inches 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 feet 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 feet 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.

MEASUREMENT AND PAYMENT.--

Seismic monitoring casing shall be measured and paid for as install seismic monitoring casing. The length of seismic monitoring casing to be paid for shall be the total length in place in the completed work, measured from the bottom tip of the casing to the ground surface.

The contract price paid per linear foot for install seismic monitoring casing shall include full compensation for 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 and rock, SPT sampling, collecting rock cores, preparing a log of test borings and boring report, furnishing and installing casing, grouting, and disposing of material resulting from drilling holes and grouting, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

SECTION 10-2. (BLANK)

SECTION 10-3. ELECTRICAL FACILITIES (SEISMIC RETROFIT)

10-3.01 DESCRIPTION

Electrical facilities (seismic retrofit) shall conform to the provisions in Section 86, "Signals, Lighting and Electrical Systems," of the Standard Specifications and these special provisions.

Electrical facilities (seismic retrofit) shall consist of:

1. Lower Deck Lighting
2. Navigational lighting system
3. Magnetic detector system
4. CCTV camera cables modifications
5. Bridge phone system
6. Navl modifications
7. Existing lighting equipment removal
8. Electrical Facilities from SFA to W-1
9. Damper work at SFA and YBIA
10. Utility platforms, camera and old call box system
11. Upper deck lighting foundations
12. Lighted sign, continuous span chord work, RTU feeder, truss verticals
13. Upper chord work
14. Spares
15. South pier and North pier W-4 electrical system
16. 15 kV cable and substation system

10-3.02 ABBREVIATIONS

The following abbreviations are added to those listed in Section 1-1.02, “Abbreviations,” of the Standard Specification:

IPCEA	Insulated Power Cable Engineering Association
JIC	Joint Industry Conference
MFMA	Metal Framing Manufacturers Association
NAVL	Navigational Lighting

NEC	National Electric Code
PVC	Polyvinyl Chloride
REA	Rural Electrification Administration
UR	Underwriter's Recognized Component
USCG	United States Coast Guard
TMS	Traffic Management System

10-3.03 CODES AND STANDARDS

All work performed and material installed or furnished in this contract shall conform to Section 86-1.02, "Regulations and Code" and the following codes and standards subject to the modifications and additional requirements in these special provisions:

1. California Administrative Code, Title 24, Part 3 Basic Electrical Regulations.
2. National Fire Protection Association Standards.
3. REA Standard, "Fully Color-Coded, Polyethylene-Insulated, Polyethylene-Jacketed Telephone Cable," shall apply to telephone communication conductors and cables.
4. IPCEA No. A-61-402, NEMA WC-5, "Thermoplastic-Insulated Wire and cable for the Transmission and Distribution of Electrical Energy," shall apply to high voltage cable and 600-volt class conductors.
5. U.S. Department of Transportation, Unites States Coast Guard "Bridge Lighting and Other Signals, Enclosure 6".
6. All local ordinances.

10-3.04 COST BREAK-DOWN

The Contractor shall furnish to the Engineer a cost break-down for each contract lump sum item of work described in this Section 10-3.

The Contractor shall determine the quantities required to complete the work shown on the plans. The quantities and values shall be included in the cost break-down submitted to the Engineer for approval. The Contractor shall be responsible for the accuracy of the quantities and values used in the cost break-down submitted for approval.

No adjustment in compensation will be made in the contract lump sum prices paid for the various electrical work items due to any differences between the quantities shown in the cost break-down furnished by the Contractor and the quantities required to complete the work as shown on the plans and as specified in these special provisions.

The sum of the amounts for the units of work listed in the cost break-down for electrical work shall be equal to the contract lump sum price bid for the work. Overhead and profit shall be included in each individual unit listed in the cost break-down, however, costs for traffic control system shall not be included. Bond premium, temporary construction facilities, plant and other items will not be paid for under the various electrical work items and shall be included in the mobilization bid item for the entire project.

The cost break-down shall be submitted to the Engineer for approval within 20 days after the contract has been approved. The cost break-down shall be approved, in writing, by the Engineer before any partial payment for the items of electrical work will be made.

At the Engineer's discretion the approved cost break-down may be used to determine partial payments during the progress of the work and as the basis of calculating the adjustment in compensation for the item or items of electrical work due to changes ordered by the Engineer. When an ordered change increases or decreases the quantities of an approved cost break-down, the adjustment in compensation may be determined at the Engineer's discretion in the same manner specified for increases and decreases in the quantity of a contract item of work in accordance with Section 41.03B, "Increased or Decreased Quantities," of the Standard Specifications.

The cost breakdown shall be divided in the following categories. Within each category, each item of work shall be broken down, as a minimum, to include the listed items:

LIGHTING MODIFICATIONS FOR THE FOLLOWING BID ITEMS:

a. STERLING SUBSTATION TO SFA
b. SFA TO PIER W-2
c. PIER W-2 TO PIER W-3
d. PIER W-3 TO PIER W-5
e. PIER W-5 TO PIER W-6
f. PIER W-6 TO YBIA

g. YBI UTILITY TUNNEL
h. STERLING SUBSTATION
i. PIER W-4 SUBSTATION
j. YBI SUBSTATION

Conduit - list by each size and installation method
Luminaires - each type
Junction and/or splice boxes - each size and type
Armored cable - each type, conductor number and sizes
Conductors - each size and type
Armored cable connectors -each size and type
Luminaire mounting or hanger - each type
Fused splice connectors - each size and type
Conduit bodies - each size and type
Lighting circuit control equipment - each item and quantity
Conduit and cable clamps - each size and type
Scaffolding and rigging - each incidence and type
Equipment or material removal - each item and quantity
Temporary lighting - per square foot
Paint removal, Priming, Painting - per square foot
Rental equipment with cost exceeds $5,000 - each item
Items that are nearly all labor with cost exceeds $5,000 - each item

BRIDGE TOWER NAVIGATIONAL LIGHTING (MODIFICATIONS)

Conduit - list by each size and installation method
Junction and/or splice boxes - each size and type
Armored cable - each type, conductor number and sizes
Conductors - each size and type
Armored cable connectors -each size and type
Conduit bodies - each size and type
Conduit and cable clamps - each size and type
Scaffolding and rigging - each incidence and type
Equipment or material removal - each item and quantity
Temporary lighting - each item
Paint removal, Priming, Painting - per square foot
Rental equipment with cost exceeds $5,000 - each item
Items that are nearly all labor with cost exceeds $5,000 - each item

MAGNETIC DETECTOR MODIFICATIONS

Conduit - list by each size and installation method
Junction and/or splice boxes - each size and type
Armored cable - each type, conductor number and sizes
Conductors - each size and type
Armored cable connectors -each size and type
Conduit bodies - each size and type
Conduit and cable clamps - each size and type
Scaffolding and rigging - each incidence and type
Equipment or material removal - each item and quantity
Temporary lighting - per square foot
Paint removal, Priming, Painting - per square foot
Rental equipment with cost exceeds $5,000 - each item
Items that are nearly all labor with cost exceeds $5,000 - each item

CCTV CAMERA CABLES (MODIFICATION)

Conduit - list by each size and installation method
Navigation Cabinet - each
Splice Box (24" x 20" x 10") - each
AC current sensor relay - each
30 Ampere contactor - each
50 Ampere, 240 Volt 2 pole circuit breaker - each
30 Ampere, 120 Volt 1 pole circuit breaker - each
CCTV control cable (15#18) - each
Telephone Cable (6 pair #19) - each
Junction Box (12” x 8” x 4”) - each
Liquid Tight Flexible Conduit (1 1/2”) - each
Conductors - each size and type
Paint removal, Priming, Painting - per square foot

BRIDGE PHONE SYSTEM MODIFICATIONS

Telephone cable - each size and type
Telephone cable connector - each size and type
Scaffolding and rigging - each incidence and type
Equipment or material removal - each item and quantity
Rental equipment with cost exceeds $5,000 - each item
Items that are nearly all labor with cost exceeds $5,000 - each item

NAVL MODIFICATIONS

Conduit - list by each size and installation method
Junction and/or splice boxes - each size and type
Armored cable - each type, conductor number and sizes
Conductors - each size and type
Armored cable connectors -each size and type
Conduit bodies - each size and type
Conduit and cable clamps - each size and type
Scaffolding and rigging - each incidence and type
Equipment or material removal - each item and quantity
Temporary lighting - per day
Paint removal, Priming, Painting - per square foot
Rental equipment with cost exceeds $5,000 - each item
Items that are nearly all labor with cost exceeds $5,000 - each item

EXISTING LIGHTING EQUIPMENT REMOVAL

Conduit - list by each size and removal method
Armored cable - list by size, type and removal method
Junction and/or splice boxes - each size and type
Conduit and cable clamps - each type
Fluorescent lighting - each fixture
Lighting brackets - each
Paint removal, Priming, Painting - per square foot
Rental equipment with cost exceeds $5,000 - each item
Items that are nearly all labor with cost exceeds $5,000 - each item

SOUTH PIER / NORTH PIER W-4 MODIFICATIONS

Conduit - list by each size and installation method
Luminaires - each type

Junction and/or splice boxes - each size and type
Armored cable - each type, conductor number and sizes
Conductors - each size and type
Armored cable connectors -each size and type
Luminaire mounting or hanger - each type
Conduit bodies - each size and type
Conduit and cable clamps - each size and type
Scaffolding and rigging - each incidence and type
Paint removal, Priming, Painting - per square foot

OTHER MODIFICATIONS IN BID ITEMS NOT LISTED ABOVE

Conduit - list by each size and installation method
Junction and/or splice boxes - each size and type
Armored cable - each type, conductor number and sizes
Conductors - each size and type
Armored cable connectors -each size and type
Conduit bodies - each size and type
Conduit and cable clamps - each size and type
Scaffolding and rigging - each incidence and type
Equipment or material removal - each item and quantity
Temporary lighting - per square foot
Rental equipment with cost exceeds $5,000 - each item
Items that are nearly all labor with cost exceeds $5,000 - each item
Utility platforms - each location
Call box cable - each size and type
Telephone Cable - each type installation over 100 feet
Magnetic detector cable - each size and type
Equipment relocation or modification - each item
Spares - each item
Paint removal, Priming, Painting - per square foot

10-3.05 EQUIPMENT LIST AND DRAWINGS

The Contractor shall submit within 60 calendar days after approval of the contract, a complete list of equipment which he/she proposes to install, manufacturer's catalog information, shop drawings of custom fabricated units and such other data as required by the Engineer.

The Contractor shall submit 3 working days prior to beginning work in certain areas as depicted in the plans, a complete list of equipment which he/she proposes to install, manufacturer's catalog information, shop drawings and such other data as required by the Engineer.

Drawings submitted by the Contractor shall be approximately the same size as the contract plans (24" x 36").

The list shall include all items identified on the plans or in these special provisions by the Manufacturer's designation. The list shall be complete as to the Manufacturer's name, catalog number, address, and telephone number. The catalog information shall contain information such as physical size, weight, rating, and such additional data as may be required by the Engineer. All data submitted shall be clearly identified by the name of the project and shall be made in quadruplicate.

The list of equipment to be submitted by the Contractor shall include but not limited to the following:

1. Armored Cables, cables, conductors, cable connectors, splices and terminations, strain relief connectors
2. Conduits, liquid tight conduits and fittings, conduit bodies, clamps, hangers, fittings
3. Junction boxes, splice boxes, enclosures, covers, doors
4. Lighting luminaires, tubes, hangers, control equipment, fuses, splices
5. Hardware, fasteners, screws, bolts, nuts, washers
6. Scaffolding, rigging
7. Equipment and material removal
8. Temporary equipment installation
9. Electrical components.

10-3.06 MAINTAINING EXISTING AND TEMPORARY ELECTRICAL SYSTEMS

The Contractor shall provide any and all necessary temporary facilities as required to keep all electrical facilities in continuous operation as described below. The Contractor is responsible for coordinating all electrical work with all other Contractors and entities. Temporary electrical facilities shall be installed as required prior to structural or other work that may effect the electrical facilities.

Where damage to facilities is caused by the Contractor's operations, the Contractor shall, at Contractor's expense, repair or replace damaged facilites promptly in accordance with the Standard Specifications. If the Contractor fails to complete the repairs, the repairs will be made by State forces at the Contractor's expense.

All facilities shall remain in full operation 24 hours per day except:

1. Part of the MARINE Navigational Lighting system may be inoperative for construction providing:

   a. That the Marine Radar Beacon system is completely operational across the entire bridge.
   b. And that the weather is clear enough as determined by the Engineer.
   c. And only one channel of the Navigational Lighting system is inoperative at a time.

2. Part of the AIRCRAFT Navigational Lighting system may be inoperative for construction providing:

   a. That the Contractor shall maintain existing navigational circuits during construction.
   b. And the electrical shutdown shall be limited to periods between sunrise and sunset on clear days. The Engineer shall determine if it is safe to shutdown under unclear conditions.
   c. And the Contractor shall complete the electrical work at one location before beginning at another location.

3. Portions of the highway lighting system may be inoperative during construction providing:

   a. It is during daylight hours and that the weather allows as determined by the Engineer
   b. Or temporary, Engineer approved, lighting of a minimum of 1/2 foot-candles of highway lighting is provided throughout the construction zone. The temporary lighting maximum to minimum ration shall be less than 7 to 1. The Contractor shall have a calibrated light meter available for measuring lighting levels. The Contractor shall demonstrate to the Engineer upon demand that the light levels are being met.

4. Portions of the Call Box system may be inoperative providing:

   a. No more than two consecutive call boxes are inoperative at any location, and no less than six operational call boxes separate any inoperative call box or pair of call boxes,
   b. Or the Contractor shall provide personnel whose sole responsibility is to contact the TMS personnel in the event that the motoring public should require an operational call box. The Contractor shall notify the TMS personnel of the exact location of the troubled vehicle. The Contractor shall contact the TMS personnel within one minute of the incident occurrence. The Contractor shall inform the motorist within one minute after notification that the TMS personnel have been notified.

5. Portions of the Magnetic Detector system may be inoperative for construction providing no more than one location (10 detectors per location) is inoperative at a time unless prior written approval is given by the Engineer.

6. Portions of the bridge communication system may be inoperative for construction providing:

   a. The down time is approved by the bridge maintenance department through the Engineer
   b. And only one telephone location is inoperative at a time
   c. And the telephone located at the pier W-4 substation remains operational at all times.

7. Portions of the CCTV camera system may be inoperative for construction providing:

a. The Contractor shall modify existing CCTV circuits, one tower at a time.
b. And the CCTV camera modification work at each tower shall be completed in 5 consecutive working days except tower 2 work shall be completed in 10 consecutive working days.
c. If longer down time is required, the Contractor shall submit for approval a temporary relocation proposal.

10-3.07 CONDUIT

Conduit to be installed shall be the rigid steel or rigid non-metallic type unless otherwise specified.

When a standard coupling cannot be used for coupling metal type conduit, a UL listed threaded union coupling, as specified in the third paragraph in Section 86-2.05C, "Installation," of the Standard Specifications, or a concrete-tight split coupling or concrete-tight set screw coupling shall be used.

LIQUID TIGHT FLEXIBLE CONDUIT (LTF).--Use of LTF is permitted where depicted on the plans only. The LTF conduit shall be non-metallic. The conduit shall meet the requirements of UL non-metallic conduit. The conduit shall conform to the provisions of article 351 of the NEC under “Non-Metallic LTF conduit”.

The PVC jacket shall be UL approved sunlight resistant.

10-3.08 CONDUCTORS, CABLES AND WIRING

Splices shall be insulated by "Method B". All ends of unused conductors shall be insulated with electrical PVC tape.

The Contractor shall provide the Engineer a Certificate of Compliance from the manufacturer in accordance with the provisions of Section 6-1.07, "Certificates of Compliance," of the Standard Specifications for all the conductors and cables furnished for the project, including medium voltage cables.

The third paragraph of Section 86-2.08B, "Multiple Circuit Conductors," of the Standard Specifications is amended to read:

Conductors for wiring wall and soffit luminaires shall be stranded copper, with insulation rated for use at temperatures up to 125°C.

In addition to the requirements for splices in detector circuits, the open end of cable jackets or tubing shall be sealed in a manner similar to the splicing requirements to prevent the entrance of water.

Section 86-2.09D, "Splicing," of the Standard Specifications is amended by retitling as "Splicing and Terminations," and the last paragraph is amended to read:

All splices and terminal lugs for conductor sizes No. 8 and smaller shall be soldered by the hot iron, pouring or dipping method. Open flame soldering will not be permitted.

10-3.08A CLOSED CIRCUIT TELEVISION CABLES

Television control (TVC) cable shall consist of 15 No. 18 conductors, unshielded and with an outer jacket. Each conductor shall have a minimum of 16 tinned copper stands with a minimum of 15 mils insulation. Individual conductor insulation shall be chrome PVC with a nominal thickness of 40 mils. The outside diameter of the jacket shall not exceed 0.55 inch.

Color code for TVC cable shall be:

1. Black
2. White
3. Red
4. Green
5. Orange
6. Blue
7. White/ Black
8. Red/ Black
9. Green/ Black
10. Orange/ Black
11. Blue/ Black
12. Black/ White
13. Red/ White

14. Green/ White
15. Blue/ White

10-3.08B TELEPHONE CABLE

Portions of the existing bridge telephone and communication system shall be removed to facilitate structural work. The Contractor shall replace the entire bridge communication system rather than splice the existing communication cable system. The Contractor shall install the new Telephone Cable (TC) and make the system fully operational prior to removing any existing communication systems or equipment. The existing bridge communication system cable shall be replaced with the cable described as follows:

The telephone cable (TC) shall consist of at least 8 pairs of No. 16 minimum copper conductors except in the West Bay Towers where it shall consist of at least 6 pairs of No. 19 minimum. Conductors shall be twisted in pairs. Each conductor shall be insulated with color coded material rated at 600 Volts. The insulation shall be 18-mils minimum.

Color code for TC cable at the West Bay Towers only 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 aluminum or copper shield which contains a drain wire. In the West Bay Towers, the core shall be protected by a non-hygroscopic polyester film with a single longitudinally applied 5-mil thick corrugated copper shield (or 8-mil thick 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 flame retardant, moisture resistant, sunlight resistant, heat stabilized polyethylene or PVC material of 0.066 inch thickness minimum. Splices shall not be allowed, except on terminal blocks inside splice boxes provided by the Contractor for that purpose, and specified elsewhere in these special provisions. Note that distances between some splice boxes will be at least 2.300 feet.

Some of the equipment that shall be removed which is part of the telephone system is the old auto call system located on the lower deck, north side. Other equipment may require removal or relocation to facilitate structural work. It is the responsibility of the Contractor to verify each communication circuit completely prior to any modifications or work on the telephone system.

All conductors shall be terminated inside existing communication equipment as required. Connection to the existing cable shall be made at the locations depicted on the plans using existing equipment and methods.

The TC shall be secured to the structure using cable or wire ties spaced at a maximum of 10 feet apart, and no more than 1 foot from any splice, junction box, or routing angle. There shall be less than 3 inches of slack between any two attachment points, and the TC shall not sag more than 6 inches between any two attachments. The TC shall not be secured to existing cables, AC, conduits, pipes, or other non-structural equipment. Conduit channel supports are acceptable supports, used conduit clamps are not. The TC shall be placed such that no more than 3 feet total of cable is suspended between any two secured points for horizontal runs.

If a suitable structural member is not available for attachment, the Contractor shall install one, or drill one 1/4 inch maximum diameter hole in the structure at the required location. A device for attachment to the structure shall be stainless steel, and attached to the structure using fastening methods described elsewhere in these special provisions. Use of wire holders with adhesive backs is prohibited. No glue or adhesive of any kind shall be used for attachment.

10-3.08C ARMORED CABLE (Not applicable to 15 kV modifications)

All armored cable shall have the following characteristics:

1. UL listed type MC;
2. Volt rated 0° C to +90°C;
3. NEC Class 1 and 2, Division 2, and Class 3, Division 1 and 2;
4. Conductors shall be bare annealed copper, Class B stranding per ASTM-B8
5. Insulation shall be crosslinked polyethylene per ICEA Standard S-66-524 and shall meet or exceed UL Standard 44 for XHHW conductors;
6. Circuit identification shall be permanent markings on or part of the insulation;

7. Armor shall be aluminum, and shall be positively interlocking or welded seam corrugation type;
8. Jacket shall be extruded black or gray PVC rated 0°C to +90°C sunlight resistant;
9. Conductor size and number per plan.

10-3.08D COMMUNICATION CABLE

The communication cable shall be a 50 No. 19 shielded twisted pair conductor cable. Conductors shall be solid annealed copper. The insulation shall be polyolefin with standard telephone color coding. A non-hydroscopic wrap shall be applied over the cable core. A 1.75 mil (minimum thickness) copper synthetic polymer back tape, overlapped to provide 100 percent coverage, and a 19 stranded copper drain wire shall be provided. The outer jacket shall be black polyethylene. The cable shall be rated 300 volts, and shall be suitable for wet and dry locations and for installation in conduit.

Unless otherwise specified or shown, at least 9 inches of cable slack shall be left in each junction box and 3 feet of cable slack in each pull box. Cable slack shall be coiled neatly and the bare end of the conductors taped.

10-3.09 CONNECTORS, SEALANTS, COMPOUNDS, WIRE TIES, AND SPLICING

TELEPHONE CABLE STRAIN RELIEF CONNECTOR.--The Telephone Cable (TC) shall enter the bottom of the new TC splice box by way of a strain relief connector. The TC shall enter existing equipment by way of a strain relief connector located per field conditions, and the end sealed using a silicone or urethane based waterproofing sealant at least 1/4 inch thick.

The strain relief connector housing shall be made of high quality steel or aluminum. The strain relief connector shall be designed specifically for attachment of the size and type of TC selected by the Contractor for this project, and shall be UL listed.

ARMORED CABLE CONNECTORS.--All armored cable connectors shall be of the type specifically manufactured for use with the type armored cable being installed. All connectors shall be of the size corresponding to the armor size on which it is to be installed. The connectors shall have the following characteristics:

1. UL listed type MC.
2. UL listed for outdoor use.
3. Provide a positive grounding bond from the armor to the termination enclosure.
4. Made of a non-corrosive material such as stainless steel, brass, or copper free aluminum.

COMMUNICATION CABLE SPLICES (on towers only).--Splices for twisted pair, shielded cables as recommended by the cable manufacturer and suitable for the environment that it is situated in shall be used. The Contractor shall submit the splicing method to the Engineer for approval.

CABLE OR WIRE TIES.--The cable or wire ties shall be the nylon, self locking, weather resistant type, and shall be UL listed recognized (UR). The tensile strength of the ties shall be rated 50 pounds minimum, and shall be 120 pounds minimum when used on the lighting armored cable clamps. The length of the ties shall be 9 inches or less. At no time shall 2 or more ties be attached together.

Installation of cable or wire ties shall be with the use of installation tools designed specifically for installing the type of ties being used. The “tails” or excess tie material shall be removed to within 1/4 inch of the locking head. The reusable or releasable type ties shall not be used.

ANTI-CORROSION COMPOUND.--All terminations using lugs, terminal blocks, pressure connectors, or where the termination or conductor is exposed, shall be treated with an anti-corrosion compound. The anti-corrosion compound shall be manufactured specifically for use on electrical devices by a manufacturer that specializes in making compounds for electrical applications.

WIRE PULLING COMPOUND.--Section 86-2.09B “Installation” shall be modified to include the following:

The inert lubricant (wire pulling compound) shall be of the non-petroleum type. It may be factory prepared or field mixed according to the manufacturer’s specifications. The pulling compound shall be one of the ready-to -use types listed below, or the manufacturer’s equivalent for field mixing:

American Cable Colloid Co. - Sli X-300
Cable Associates, Inc. - Gel-Lube 7/5
Generam Machine Products Co. - No. 7437-PC
Ideal Industries, Inc. - Aqua-Gel II or CW
Mac Products, Inc. - MacLube No. CA-51
Minerallac Electric Co. - Minerallac H-2B
Plymouth Rubber Co. - No. 45 Cable Pulling Lubricant
Polywater Corp. - "A", "G", "J", or "WJ"

SILICONE AND URETHANE SEALANT COMPOUNDS.--All Silicone and urethane sealant compounds shall comply with the following:

a. Be manufactured specifically for sealing against water or waterproofing
b. Provide a positive seal against water after curing
c. Cures without shrinkage
d. Normal use temperature from at or below -20° F to at or above +200° F
e. Cures at room temperature
f. Remain pliable after curing
g. Completely cure within 72 hours

At no time shall silicone or urethane sealant compound be applied for a thickness of more than 1/2 inch.

10-3.10 CABINETS, JUNCTION BOXES, SPLICE BOXES

TELEPHONE CABLE SPLICE BOX.--Telephone Cable (TC) splice boxes shall be placed at locations shown on the plans. Each TC spice box shall be rated NEMA 3R, sized six inches wide by eight inches long by four inches deep, minimum. The cover shall be side hinged, and shall have a nameplate on the cover labeled "BRIDGE PHONE SYSTEM".

Each TC splice box shall have permanently mounted inside, one terminal block with 18 electrically separated compression type dual lugs. The terminal lugs shall be specifically designed for terminating 16 AWG copper conductors. The terminal block shall be rated 300V AC minimum, and shall be provided with nickel, silver, or cadmium plated brass binder head screw terminals. Each terminal block shall be rated 5A minimum with No. 10x8-mm nickel plated brass binder hear screws and nickel plated brass inserts. Each pole position shall be provided with 2 terminal positions. The terminal blocks shall be the barrier type, with shorting bars in each of the positions, and be provided with integral type marking strips.

All terminations shall have an anti-corrosion compound applied to the conductor and terminal lug at the time of termination.

NAVIGATION CABINET.--The cabinet shall be NEMA type 3R, 12 gauge galvanized steel. The cabinet shall have drip shield top and seam-free sides for both front and back. The cabinet shall have mounting holes on the back. The cabinet shall have galvanized steel lift-off hinges with stainless steel hinge pin. The Contractor shall drill holes to the cabinet (as required by the plans) and provide weather-proof connectors for conduit installation. The cabinet shall be painted per standard specifications**.**

TOWER SPLICE BOX AND TERMINAL BLOCKS

Tower splice box.--The tower splice box shall NEMA be type 3R, 14 gauge galvanized steel. The cover of the box shall be side hinged. The box shall be painted with the same type and color of paint being used on the structure.

Terminal blocks (0 to 600 volts).--All the terminal blocks shall meet the following requirements:

1. UL 486 E and UL 1059.
2. Capable of termination of all power and/or control circuits entering or leaving equipment, boxes or cabinets.
3. Screw clamp compression, dead front barrier type, with current bar provided direct contact with wire between the compression screw and yoke.
4. Yoke, current bar and clamping screw shall be high strength and high conductivity metal.
5. Yoke shall guide all strands of wire into terminal.

6. Current bar shall ensure vibration-proof connection.
7. Terminals shall be:

   a. Capable of wire connections without any special preparation other than stripping.
   b. Capable of jumper installation with no loss of terminal or rail space.
   c. Individual, rail mounted, secured to the back of splice box or navigation cabinet.

LIGHTING SPLICE BOX.--For the purpose of these special provisions, a lighting splice box shall be the enclosure in which the lower deck luminaire feeder taps into the lighting branch circuit. The branch circuit's splice and the luminaire's fused splice connector is located inside the splice boxes.

The lighting splice box shall be made of non-corrosive metal such as 12 GA galvanized or stainless steel, or of cast metal such as iron or copper free aluminum. Cast assemblies shall be finished with a non-corrosive bonded coating such as epoxy/polyester or zinc electroplate/acrylic paint. Non-cast assemblies shall be finished with a baked on polyester powder coating typical of exterior electrical equipment. Non-cast assemblies shall be the welded seam type, rated NEMA 3R.

The splice box cover shall be composed of the same material as the housing, or from other material discussed above. The cover shall be attached to the housing by no less than four stainless steel screws, The cover gasket shall be composed of material commercially available for use in electrical outdoor enclosures.

The cast housing shall be mountable with no less than 2 external mounting lugs or ears. Non-cast assemblies shall be mounted with no less than 4 screws or bolts. The assembly shall be water tight after mounting and all cables and the cover are installed.

The minimum dimensions shall comply with the following:

Conductor	Longitudinal dimension (inches)	Volume (cubic inches)	Opening area (square inches)
#8	7.6	70	20
#6	8.8	80	25
#4	11.0	100	30
#2	14.0	130	40

The minimum inside longitudinal dimension shall be 7.6 inches. The minimum volume shall be 70 cubic inches. The housing opening shall be unobstructed for at least 20 square inches. The Armored Cable (AC) attachment method shall be water tight, and provide a positive ground. The branch and feeder AC shall enter from the sides or bottom of the box. Entry into the top of the box is prohibited.

After installation, the splice box and connectors shall be completely painted with the same type and color of paint being used on the structure.

JUNCTION BOXES.--Junction boxes shall conform to the details shown on the plans and as specified in these special provisions.

All junction boxes to be installed in wet or outdoor locations shall meet NEMA Standard for Type 3R enclosures and those for indoor locations shall conform to NEMA Standards for Type 12 enclosures. Junction boxes shall also conform to JIC Standards for pull boxes. Junction boxes shall be fastened with stainless steel screws.

All junction boxes shall be provided with removable front covers secured with non-corrosive screws or screw held latches. Provisions for drainage of water caused by condensation shall be provided for each junction box installed outdoors.

Junction boxes shall be standard commercial products specifically manufactured for the use in electrical installations.

After installation, the junction boxes shall be completely painted with the same type and color of paint being used on the structure. Attention is directed to priming and painting under "Clean and Paint Structural Steel" section elswhere in these special provisions. The name plate shall not be painted.

10-3.11 FOUNDATION BOLTS

Foundations and pedestals that are removed shall be installed in the same location as before removal. The bolts used to reattach the foundations and pedestals shall be of the same size that was removed. The bolts shall be the high strength type.

10-3.12 NAMEPLATES

Nameplates shall be installed on equipment as shown on the plans.

Nameplates shall be laminated phenolic plastic, black front with white core. Lettering shall be etched through the outer covering, indicating the function of the device or assembly unit. The character size shall be 1/4 inch unless otherwise noted.

The nameplates shall be fastened to the enclosure's exterior surface using stainless steel rivets or stainless steel screws.

10-3.13 SPARES

The Contractor shall provide the following spares prior to the acceptance of the contract:

1. two spare lighting contactors of the same type installed
2. two spare lighting circuit breakers of the same type installed
3. two spare lighting circuit control transformers of the same type installed
4. six spare primary fuses of the same type installed
5. three spare secondary fuses of the same type installed
6. two spare ballasts of the type used in the 250 W HPS fixtures
7. ten spare ballasts of the type used in the 150 W HPS fixtures
8. two spare lamps of the type that are used in the 250 W HPS fixtures
9. ten spare lamps of the type that are used in the 150 W HPS fixtures
10. two spare ignitors of the type that are used in the 250 W HPS fixtures
11. ten spare ignitors of the type that are used in the 150 W HPS fixtures
12. two spare 15 ampere, three pole circuit breakers of the same type that are used in the Beale Street low voltage control center
13. one spare 15 ampere, three pole circuit breaker of the same type that is used in the Beale Street low voltage control center
14. one spare 45 ampere, three pole circuit breaker of the same type that is used in the Sterling low voltage control center

The spares shall be delivered to the SFOBB electrical shop following arrangements with the Engineer.

10-3.14 LUMINAIRES, LAMPS, TESTING, LIGHTING CONTROL EQUIPMENT

10-3.14A LUMINAIRES

All luminaires on this contract shall have a nominal wattage rating according to the plans, and comply with Section 86-6.01 "High Pressure Sodium Luminaires" of the Standard Specifications with the following changes and additions:

All lighting fixtures shall be complete with ballasts and lamps and operate from a nominal 480V, 60 Hertz power source and shall be capable of starting and operating the specified lamp within the limits specified by the lamp manufacturer. The luminaries shall be suitable for wet locations per UL 1572, listed for 40°C Ambient, and meet the requirements of UL 595 marine.

Materials.--Materials within the luminaire shall be supplied in accordance with the following requirements:

1. The housing and door shall be die cast copper free aluminum alloy 360.1 with a minimum thickness of 0.10 inch. Door assembly shall have mechanical stops to limit gasket compression to 25% and prevent permanent distortion.
2. The reflector assembly shall consist of high purity aluminum of minimum 0.03 inch thick sheet. Aluminum used for the reflector shall be #3002 alloy.
3. All lighting fixtures shall be painted. Painted finishes of fixtures and accessories shall be applied such that the entire assembly is rendered completely corrosion resistant.
4. Where aluminum parts come in contact with bronze or stainless steel parts, apply to both surfaces a coating of corrosion protection material.
5. Components, fasteners and hangers required shall be Type 316 stainless steel.
6. Lampholders and lamp sockets shall hold lamps securely.

7. Gasketing shall be hollow core extruded Silicone Rubber. All shapes used shall be completely cover flange to which gasket is affixed.

Finish.--The luminaire housing shall be alkaline cleaned and covered with zinc phosphate to provide a non-conducting bond between the base metal and paint. A sealing layer of non-chrome material shall cover the zinc phosphate to maximize corrosion resistance. After a deionizing water rinse, polyester powder paint shall be electrostatically applied and cured at 218°C. Final finish thickness shall be 2 to 4 mils.

The luminaire housing shall have a painted polyester finish to withstand a one thousand (1,000) hour salt spray test as specified in ASTM Designation: B 117 with no more than 1/8" creep from a substrate scribe mark on material of a type identical to that used in fixture construction.

A flexure test per ASTM D522 of the paint finish shall be performed on a .040" thick 1100 aluminum test panel and no cracking shall be evident at the 1/8" bend radius.

The aluminum reflector shall be treated to provide the necessary light reflectance compatible with the optical design requirements.

Lampholders.--The lampholders shall be porcelain keyless medium or mogul construction, as required by lamp size, wired with high temperature 16 Gauge wiring. The sockets shall be pulse rated at 4 kV. The screw shell shall be nickel-plated brass and shall incorporate anti-vibration grips. The center contact shall be spring loaded.

Ballasts.--The ballast operating characteristics shall comply with the recommendations of the lamp manufacturer with regard to lamp electrical characteristics. The ballast shall be suitable for line voltage (+/- 10%) with a 0.9 power factor, and maximum current crest factor of 1.8. The ballast shall provide reliable lamp starting at -40°C. The ballast shall conform to the applicable requirements of UL 1029.

The Ballasts and all related electrical components shall be removable and replaceable as a single unit without disturbing the aiming.

Wiring.--The fixture wires shall be stranded tinned-copper construction, not smaller than No. 16 AWG. The insulation shall be crosslinked polyolefin (UL style 3321) and 150°C rated. Wireways and wiring channels shall have rounded edges or bushed holes wherever conductors pass through. Insulated Bushings shall be installed at points of entrance and exit of wiring. Each luminaire shall be fused internally with a fast-acting type fuse to disconnect the luminaire from the branch circuit in case of ballast failure or other electrical problem within the luminaire.

Fixture hardware.--Screws, bolts, or other assembly and mounting parts, shall be Type 316 stainless steel.

Welding.--Locate weld inside assemblies to be anodized to conceal visible discoloration in the heat-affected zone. Where weld metal will be exposed after anodizing, select a filler alloy to closely match composition of the base metal. Comply with parent metal manufacturer's recommendations for such filler alloys.

Mechanical construction.--The housing shall be heavy duty die-cast copper free aluminum. The door shall contain all electrical components including the socket with a quick disconnect plug and shall be hinged for installation or removal. Complete replacement of all electrical components shall take less than 60 seconds. The luminaire shall be designed and suitable for mechanized cleaners with no exposed clasps or latches.

Lens assembly.--The optical assembly shall be fully enclosed and gasketed. It shall include an anodized reflector. The reflector shall have transverse elliptical fluting to minimize re-direction of light energy through the arc tube and to provide even illumination on the lighted surface, free from streaks or striations. The lens shall be 0.175 inch minimum thickness tempered glass.

Optical control/photometric performance.--The luminaries shall have a symmetrical photometric distribution. The Isolux curve of the luminaires shall match those in the plans.

Mounting brackets for fixture supports.--Mounting brackets shall be integral to a bolted metal framing system. and constructed according to the plans. The fixture shall fit the mounting bracket without modification.

Ignitors.--The device(s) which interface the ballast with the tube, sometimes called the “starter” or “ignitor” shall be called the ignitor for the purposes of these special provisions. The ignitor shall be designed to eliminate stress

on the ballast due to a missing or burned out tube by directing the high voltage spike directly to the lamp without being directed to the lamp through the ballast windings, or by stopping the starting cycle. The ignitor shall be capable of being used with the type of ballasts used in this project. The ignitor shall be designed so that a cycling or extinguishing lamp shall not adversely affect the ignitor or ballast The ignitor shall be UL listed. The ignitor shall be warranted against defective materials and workmanship for a period of at least five years.

Installation.--The luminaires shall be mounted centered between the floor beams. The luminaires shall be mounted on the stringer that is over the outside lane, but closest to the adjacent lane. The luminaires shall not be mounted directly above the traveler rail or on a stringer outside of the traveler rail. It shall be possible to replace the luminaire from the outside lane without closing the adjacent lane.

The installation of the luminaires shall be according to the plans, the manufacturer's instructions, and adjusted per field conditions with the Engineers approval. The luminaire shall be adjusted such that the light illuminating the floor beam within the cutoff region is minimized.

10-3.14B LUMINAIRE LAMPS

All luminaires on this contract shall have a lamp installed. The type of lamp shall be High Pressure Sodium, wattage corresponding to what is shown on the plans. All lamps shall be manufactured specifically for the type of luminaire selected, modification of the lamp or luminaire is prohibited.

All lamps shall be the dual element, instant restrike type.

10-3.14C LIGHTING CURRENT TESTING

After all of the luminaires on a circuit have been installed, the Contractor shall make and record true RMS current measurements in the presence of the Engineer with all luminaires illuminated. The Contractor shall provide a typed or computer generated form on which the measurements are to be recorded. The Contractor shall provide a true RMS current meter for this purpose.

The measurements shall be taken on all phases of each branch at fifteen and thirty luminaires from the end of the circuit and at the lighting control enclosure. The current measurements shall demonstrate that the loads are nearly balanced.

10-3.14D LIGHTING CONTROL EQUIPMENT

The Contractor shall install any and all devices and equipment required to make the lighting circuits fully functional. All new equipment shall be installed in the existing control enclosures as required. Existing hand switches and indicator light housings and lenses shall remain in place. The Contractor shall replace all existing indicator bulbs with like kind. All control equipment shall be UL listed.

Lighting contactors.--All lighting contactors shall be manufactured specifically for the purpose of controlling sodium vapor lighting loads. The contactors shall be rated as shown on the plan, 480V, 60 Hz, and have a control circuit voltage of 120V, 60 Hz. They shall be the electrically or magnetically held type, and shall have three poles for controlling lighting power, and two poles for control circuit use.

All lighting contactors shall be of the same manufacturer and model number.

Lighting circuit breaker.--All lighting circuit breakers shall be manufactured specifically for the purpose interrupting power to sodium vapor lighting loads. The circuit breakers shall be of the three pole molded plastic, thermal magnetic type, and shall be rated as shown on the plans at 480 V, 60 Hz. They shall have a UL listing for the interrupting rating (RMS symmetrical amperes) of at least 18,000 amperes.

All lighting circuit breakers shall be of the same manufacturer and model number, or have identical mounting dimensions.

Control circuit transformer.--All lighting circuit control transformers shall be manufactured specifically for the purpose of powering lighting or motor control circuits. The transformers shall be rated as shown on the plans, 120V, 60 HZ, of the 55 degrees centigrade rise 105 degrees centigrade class, and shall have a fuse block that is an integral part of the unit, and the fuse block shall have all the fuses installed.

All control circuit transformers shall be of the same manufacturer and model number, or have identical mounting dimensions.

Control circuit transformer fuses.--All lighting circuit control transformer fuses shall be manufactured specifically for the purpose of protecting control transformers. The primary fuses shall be sized as shown on the plans, and the secondary fuse shall be sized as shown on the plans time delay type.

All lighting circuit control transformers shall be of the same manufacturer and model number, or have identical exterior dimensions.

Substitutions.--Substitutions for the control circuit transformer VA capacity only (and related fuses) may be made if the Contractor demonstrates to the Engineer by using the manufacturer's data that the proposed lighting contactors and indicator lights will function correctly using a 90% secondary voltage and the published sealed and inrush currents of the devices. The Contractor shall match the primary and secondary fuses to the proposed transformer using manufacturer's data and the appropriate NEC requirements. All substitutions are subject to the approval of the Engineer.

10-3.15 BEALE STREET SUBSTATION TRANSFORMER, DISCONNECT AND CIRCUIT BREAKERS

BEALE STREET TRANSFORMER AND DISCONNECT.--The transformer shall be a dry-type distribution transformer suitable for reverse feeding. The transformer shall be sized per the plans, 480V delta primary to 480/277V wye secondary, of the two winding type, self-cooled, and with series multiple windings. The transformer shall be designed, manufactured, and tested in accordance with all the latest applicable ANSI, NEMA and IEEE standards, and shall be UL listed and bear the UL label. The transformer shall be designed for continuous 60 Hertz operation at rated KVA, for 24 hours a day, 365 days a year operation, with normal life expectancy as defined in ANSI C57.96.

The transformer shall have a 185 degree C insulation system, and shall be 115 degree rise. Required performance shall be obtained without exceeding the above indicated temperature rise in a 40 degree C maximum ambient, with a 30 degree C average over 24 hours. All insulation materials shall be flame-retardant and shall not support combustion as defined in ASTM Standard Test Method D635.

The transformer core shall be constructed with high grade, non-aging, grain-oriented, silicon steel with high magnetic permeability, and low hysteresis and eddy current losses. Maximum magnetic flux densities shall be substantially below the saturation point. The transformer core volume shall allow efficient transformer operation at 10% above the highest tap voltage. The core laminations shall be tightly clamped and compressed. Coils shall be of electrical grade aluminum with continuous wound construction. The core and coil assembly shall be completely encapsulated in a proportioned mixture of resin and aggregate to provide a moistureproof, shock resistant seal. The core and coil encapsulation system shall minimize the sound level.

The enclosure shall be wall mountable rated NEMA 12, and shall be made of heavy gauge steel and shall be degreased cleaned, primed, and finished with ANSI 61 color weather resistant enamel. The transformer shall be equipped with a wiring compartment suitable for conduit entry and large enough to allow convenient wiring. The maximum temperature of the enclosure shall not exceed 90 degrees C. The core of the transformer shall be grounded to the enclosure.

The transformer shall have at a minimum, full capacity taps for +5%, +2.5%, -2.5%, and-5%, of nominal voltage.

The transformer disconnect shall be placed and shall contain all of the devices and features depicted in the plans. The transformer disconnect shall be a 3 pole, rated for 600 VAC, 60 ampere minimum, and shall have an interrupting capacity of not less than 10,000 symmetrical RMS amperes. The enclosure shall be NEMA 12 wall mountable, and be made of heavy gauge steel and shall be degreased cleaned, primed, and finished with ANSI 61 color weather resistant enamel. The transformer disconnect shall be General Electric, Westinghouse, Square D, or equal.

CIRCUIT BREAKERS.--All circuit breakers shall have a nominal amperage rating according to the plans, and comply with the circuit breaker portion of Section 86-62.11 "Service" of the Standard Specifications with the following changes:

All circuit breakers shall have an interrupting rating of 14,000 amperes RMS symmetrical per UL and NEMA standards. All circuit breakers shall be General Electric TED, Westinghouse EHD, or equal. All circuit breakers shall be designed specifically for use on the type of loads which they are used.

Enclosed circuit breakers shall be NEMA type 12. The enclosure shall contain a neutral lug which is isolated from ground. The normal power disconnect shall be 3 pole, 100 ampere frame, with 1 alarm switch for remote indication. The unit shall have an external disconnect handle, which shall be padlockable.

Beale Street low voltage control center replacement branch circuit breakers shall be General Electric TED 134015, Westinghouse EHD 3015, Square D FAL 34015, or equivalent.

10-3.16 EQUIPMENT SUPPORT, CONCRETE ANCHORS, MISCELLANEOUS METAL, FASTENERS, MISCELLANEOUS ELECTRICAL DEVICE

LIGHTING SPLICE BOX SUPPORT.--All lighting splice boxes shall be permanently mounted to the structure. Direct attachment to the structure may not be possible in most locations, and at these locations, a support shall be attached to the structure, and the splice box attached to the support. It is permissible to use existing splice box supports where available.

The splice box support shall be placed as depicted on the plans, or within 5 feet of a vertical structural member.

The splice box support shall be made of a non-corrosive metal such as stainless steel or hot dip galvanized steel. The minimum thickness for any support shall be 1/8 inch, and other dimensions such as to allow for securing the splice box to the structure. All splice box supports shall be pre-drilled before galvanizing or finishing.

The support shall attach to the structure at a minimum of 2 places using 1/4 - 20 stainless steel hardware or by fasteners described elsewhere in these special provisions. The splice box shall attach to the support using a minimum of two 1/4-20 (minimum) stainless steel bolts, washers, and nuts.

After installation, the splice box support shall be completely painted with the same type and color of paint being used on the structure.

CONDUIT AND ARMORED CABLE SUPPORT.--All conduits and armored cables shall be supported with hangers, brackets, straps, supports, clamps, gutters, and devices depicted in the plans. They shall be secured to surfaces by bolts or fasteners suited for the purpose. All fastening methods shall remain secure to the surface after prolonged exposure to vibration and movement of the conduits and cables.

For single runs, single-hole malleable iron clamps of a size suitable for the conduit or cable shall be used. For multiple runs, conduits shall be grouped together using methods and devices common in the industry. New conduit and armored cable shall be installed on existing channel strut where existing channel strut space is available.

All supports shall be installed in locations where required by the NEC and shall be suitable for the installation.

CONCRETE ANCHORS.--Where concrete anchors are required, such devices shall conform to the provisions in section 75-1.03, “Miscellaneous Bridge Metal,” of the Standard Specifications.

MISCELLANEOUS METAL.--Miscellaneous metal shall consist of clamps, clamp fasteners, supports, support channels and fittings, threaded conduit extensions, couplings, armored cable clamps, and other metal products required to connect or fasten cable, conduit, luminaire, or other equipment in conformance with these special provisions. Unless otherwise specified in these special provisions, miscellaneous metals shall be in accordance with Section 75, “Miscellaneous Metal” of the Standard Specifications.

Other items may be standard commercial products specifically manufactured for the use in electrical installations and shall be galvanized in a manner consistent with the intended application.

Full compensation for conforming to the above requirements shall be considered as included in the contract prices paid for the various contract items of work and no additional compensation will be allowed therefor.

FASTENERS.--Conduit clamps, armored cable clamps, cable or wire tie supports, and splice box support which are to be attached to the steel structure by means of fasteners such as screws or bolts may use drill-and-tap, drill and nut-and-bolt, power actuated fasteners, and self-drilling screws.

Attachment using drilling or drilling and tapping shall be in accordance with trade practices using equipment specifically designed for the purpose intended, and sized accordingly. All hardware used in attachment shall be for 1/4-20 stainless steel bolts unless otherwise specified or required by equipment being installed.

Power actuated fasteners used on this contract shall be manufactured specifically for attaching clamps to structural members. The fasteners shall be sized incorporating the structural member and clamp load.

Power actuated fasteners shall be installed by properly trained and licensed operators as described in ANSI Standard A 10.3. Training and licensing shall be provided by the manufacturer or by the manufacturer’s designated representative. Job site performance tests as recommended by the manufacturer shall be conducted. Installation shall be according to the manufacturer’s specifications in all applications.

All power actuated fasteners shall manufactured from AISI 1062 steel, and have a typical minimum tensile strength of 280,000 psi and a typical minimum shear strength of 160,000 psi. They shall be of the 1/4”-20 threaded stud type, with the shank sized according to the structural member thickness,.

Self drilling screws used on this contract shall be manufactured specifically for attaching clamps to structural members. The self drilling screws shall be No. 14 or larger, and be at least 3/4 inches long.

Self drilling screws shall be installed by properly trained operators using equipment specifically designed for the installation of self drilling screws. The screw driver shall have an adjustable torque, screw depth, or variable drive clutch which results in a depth adjustment feature. Installation shall be according to the manufacturer's specifications in all applications.

MISCELLANEOUS ELECTRICAL DEVICE.--All power switches and outlets shall meet the latest NEMA Standards for Industrial System or be specification grade. Specification grade is defined as a product that meets or exceeds heavy duty NEMA test requirements. Specification grade device shall equal or exceed UL requirements. The size and type shall be as indicated on the plans and specified in these special provisions.

10-3.17 CALL BOX EQUIPMENT

CALL BOX CONNECTORS AND PINS.--All call box connectors shall be of the type shown on the plans or equivalent.

All pins to be installed into the callbox connectors shall be sized as shown on the plans, and shall be gold plated unless otherwise indicated on the plans.

CALL BOX TERMINAL BLOCK.--Each splice made in the call box cable shall be terminated on a terminal block supplied by the Contractor for that purpose. The terminal block shall be permanently mounted inside an existing or new (NEMA 3R) junction box.

Each terminal block shall be rated 660V, minimum, AC and shall be provided with nickel, silver, or cadmium plated brass binder head screw terminals.

Each terminal block shall be rated 20A and shall be provided with the number of poles to complete all terminations with No. 10x8-mm nickel plated brass binder head screws and nickel plated brass inserts. Each pole position shall be provided with 2 terminal positions. The terminal blocks shall be the barrier type, with shorting bars in each of the positions, and be provided with integral type marking strips.

The terminal positions shall be specifically designed for terminating 16 AWG copper conductors. All terminations shall have an anti-corrosion compound applied to the conductor and terminal lug at the time of termination.

10-3.18 PROTECTION OF EXISTING UTILITIES AND MAINTENANCE FACILITIES

Protection of existing utilities and maintenance facilities shall consist of providing temporary support and protection for the utilities, related structures and other maintenance facilities on the bridge, and shall conform to the provision in section 7-1.11 "Preservation of Property," of the Standard Specifications. These utilities and facilities include, but are not limited to:

1. Utility platforms, walkways, access ladders;
2. Air lines, electrical lines, lighting equipment, navigational equipment, seismic equipment and related support structures and appurtenances;
3. Traveler and other scaffolds.

Full compensation for conforming to the above requirements shall be considered as included in the contract prices paid for the various contract items of work and no additional compensation will be allowed therefor.

10-3.19 15 KV CABLE, 15 KV SPLICE BOX, CABLE TRAY AND SUPPORTS

15 KV POWER CABLE.--For this portion of the Special Provision, the term "cable(s)" shall refer to 15 kV shielded power cables run separately, grouped, or within armor. The term "armored cable" shall refer to three of these cables encased within an interlocked armor.

All cables shall be of the same gauge and manufacturer, and installed per the plans. The cables shall run continuously, and without splices except where shown on the plans.

Cable.--If the ambient temperature of where the cables are stored drops below -12°C, then the cables shall not be handled for at least 24 hours after the temperature rises above -12°C. The cables shall remain in an ambient temperature of at least 16°C for 24 hours prior to installation.

The components of the cable shall have the following characteristics:

1. Cables.--Cables shall be shielded, and rated 15kV by the manufacturer. Cables shall be UL listed Type MV-90 or MV-105. The cable shall have a performance record demonstrating a minimum of 20 years successful operating experience in utility and industrial power cable applications.

2. Conductors.--Conductors shall be Class "B" Copper Stranding sized per the plans. Conductors shall be encased with a material which reduces conductor-insulation stress.

3. Insulation and shield.--The insulation shall be a corona immune material. The insulation shall be ethylene-propylene rubber (EPR) base, rated at 133%. The insulation compound shall not contain polyethylene. The discharge of the insulation shall be demonstrated by withstanding 21 kV for 250 hours without failure when tested in accordance with the method described in ASTM D2275-89. The insulation shall be compounded by the cable manufacturer in its own facility. The insulation shall be encased with an insulating or semi-conducting shield. The shield shall be covered with a 0.005 inch copper tape shield with 20% overlap.

4. Jacket.--The jacket shall be PVC or Polyethylene, of at least 0.080 inches thickness. The jacket surface shall be printed as required by UL 1072.

The Contractor shall submit to the Engineer for approval the manufacturer and manufacturer's specifications of all power cables.

Armored Cable.--All armored cable shall contain three cables described above except without a jacket. The cables shall be fully encased within a filler to protect the shielding tape from the armor. The assembly shall be encased by a metallic interlocked armor, and the armor encased within a 0.060 inch thick minimum PVC or polyethylene jacket.

Cable and Armored Cable Pulling.--The Contractor shall submit in writing to the Engineer for approval, a schedule of pulls prior to cable installation. The Contractor shall certify in writing that the cable installation meets the requirements of the cable manufacturer and these special provisions concerning pulling tensions, allowable sidewall pressures, and installed radius limitations.

All conduits and ducts to be used, new and existing, shall be swabbed or brushed prior to installing any cable. All conduits or ducts over 200 feet in length shall be pre-lubricated prior to installing any cable.

The Contractor shall schedule with the Engineer a time in which the pulling process can be monitored by the Engineer. The Contractor shall not be compensated for the installation of any power cables which are installed in the Engineer's absence.

The cables and armored cables shall be installed using the pulling eye method. The pulling eye (s) shall be a system manufactured specifically for attaching a pull eye directly on to the conductors of shielded power cables. The single or multiple type may be employed. If not factory installed, the appropriate installation tools and kits shall be used. The eye (s) shall be sized to specifically to fit the shielded power cable being installed.

All quadrant blocks and radius cable sheaves shall have a minimum radius of 24 inches and at least five equally spaced sheaves or a minimum radius of 36 inches and at least three equally spaced sheaves. All sheaves shall be at least 2.7 inches in width.

The maximum pulling force that may be exerted on the combined cables is 1,650 lbf. The maximum pulling force that may be exerted on the armored cable is 2,500 lbf.

All pulls totaling more than 200 feet or incorporating bends totaling more than 80 degrees must incorporate the use of a dynamometer, force gauge, tension measuring or limiting device. The dynamometer or force gauge shall be adjustable to limit or stop the pulling force of the machine, or the display shall be marked prominently enough that the force can be read from a distance of 10 feet by the Engineer.

The pulling compound to be used shall be of the non-petroleum type. It may be factory prepared, or field mixed according to the manufacturer's specifications. The pulling compound shall be one of the ready-to-use types listed below, or the manufacturer's equivalent for field mixing:

American Cable Colloid Co. - Sli X-300
Cable Associates, Inc. - Gel-Lube 7/5
Generam Machine Products Co. - No. 7437-PC
Ideal Industries, Inc. - Aqua-Gel II or CW
Mac Products, Inc. - MacLube No. CA-51
Minerallac Electric Co. - Minerallac H-2B
Plymouth Rubber Co. - No. 45 Cable Pulling Lubricant
Polywater Corp. - "A", "G", "J", or "WJ"

Terminating.--All terminations and splices shall be done by personnel certified in Medium Voltage Cable Splicing. Certification shall be by a company that manufactures high or medium voltage cables, high or medium voltage cable splices, or union certification. The Contractor shall submit to the Engineer for approval the qualifications of any and all personnel that will be involved in terminating or splicing the medium voltage cables.

The cables shall be terminated in the substations using equipment and devices specifically designed for use with shielded power cable. The cables shall be installed onto the existing terminal lugs of the switchgear after removing the existing cables from the terminal lugs. All bolts, washers, and torque values shall be submitted to the Engineer for approval.

The cables shall be spliced onto the armored cable inside the new 15 kV junction box at the San Francisco Anchorage. The cables shall be spliced to the armored cable using equipment and devices specifically designed for use on the cables being installed.

All terminations and splices shall employ the no-stress cone hand-applied taped method.

All proposed termination and splice methods and equipment shall be submitted to the Engineer for approval three working days before work may begin. Do not order or fabricate any materials or devices unless approved by the Engineer.

Conduct of work.--The Engineer will make all arrangements with the Utilities and State forces for de-energizing or energizing the existing medium voltage system as required to perform the contract work. The Engineer will also perform all switching operations on State equipment on which the Contractor may need to work. The Contractor shall submit a schedule of work for approval ten working days before any of these services are required.

All work shall be performed during the hours specified elsewhere in these special provisions. All State electrical facilities shall be fully operational prior to 1400 each work day. The Contractor shall be financially responsible for any accident that may occur because of the Contractor's failure to restore a facility to full operation prior to 1400 of any day.

The Contractor shall be responsible for any and all damage to equipment or material due to improper handling, testing, or servicing procedures. The Contractor shall replace or restore to its original condition any equipment or material so damaged during the course of work at the Contractor's expense.

The new medium voltage system shall be installed, tested, and fully operational before the existing medium voltage system is to be removed, abandoned, or modified. The Contractor is responsible for coordinating this work with all other Contractors so that no part of the construction is delayed for the installation of the new medium voltage system. The Contractor shall be financially liable for any and all delays that are a result of failure to install the new medium voltage system.

Safety.--In general, all work, testing, servicing, and cleaning should be performed on apparatus de-energized and disconnected from the power source. Power circuits shall have conductors shorted to ground by a hot line grounding device. All safety equipment deemed necessary to prevent potential injury to personnel or damage to equipment shall be provided by the Contractor.

Testing.--All cables must pass an installed d.c. high-pot test as described in ICEA S-68-516. Testing on the medium voltage cables shall be performed in accordance with applicable standards and manufacturer's procedures and requirements. All testing and operational procedures shall be performed in the presence of the Engineer. Written documentation of all tension measurements and d.c. high-pot test results must be submitted to the Engineer before payment.

15 KV SPLICE BOX.--The 15 kV splice box shall be placed, sized, and fabricated per the plans and field conditions. They shall be made using the continuously welded seam method. The housing shall be 12 gauge. All edges shall ground and de-burred. The splice boxes shall be primed and painted with the same color and type of primer and paint used on the structural members.

15 kV splice box (Type I).--The Bridge 15 kV splice box (type I) shall be fabricated following an inspection of the field conditions. The placement of the attachments and other unique features shall be adjusted to fit field conditions. The Bridge 15 kV splice box shall be reinforced at the attachment points using 12 gauge plates, sized 3 inches square, and welded to the housing. The splice box shall attach to the structure using at least eight 1/2 inch bolts in 2 rows spaced per field conditions. The Contractor shall provide any and all other materials necessary to securely mount the splice box to the bridge. The front doors shall be double hinged, and shall be 14 gauge, attached with 1/4 inch captive bolts and washers spaced no more than 6 inches apart. The side doors shall be side hinged, and shall be 14

gauge, attached with 1/4 inch captive bolts and washers spaced no more than 6 inches apart. All materials and hardware shall be stainless steel.

15 kV splice box (Type II).--The 15 kV splice box (type II) shall be fabricated following an inspection of the field conditions. The 15 kV splice box shall attach to the structure using at least four 3/8 inch bolts placed per field conditions. Concrete anchors are addressed elsewhere in these special provisions. The removable panels shall be 14 gauge and attach to the housing using 1/4 inch bolts and washers spaced no more than 10 inches apart on each edge. All materials and hardware shall be stainless steel. The splice box shall be rated NEMA 3 or better.

15 KV ARMORED CABLE TRAY AND SUPPORTS.--The 15 kV armored cable tray and supports shall be fabricated per the plans and following an inspection of the field conditions; each location may require unique modifications. All components shall be welded. The cable tray shall be made of mild steel, and shall be hot dip galvanized after fabrication.

10-3.20 TEMPORARY POWER GENERATOR

The Contractor shall supply, install, and maintain a generator (s) as required to keep all electrical facilities fully functional. The placement of the generator (s) and controls shall be per the plans and as directed by the Engineer. The generator (s) shall be fully functional at all times and under all conditions while connected to the loads. Connection time shall be planned such that no system is de-energized for more than 5 minutes.

The Contractor shall supply any and all controls and or circuitry required to correctly interface the generator (s) to the loads. Modification of the temporary lighting control schematic in the plans is permitted to allow for stepping the loads, but only with the Engineer's approval.

Fuel, fuel delivery, and fuel storage shall be provided at the Contractor's expense. Sufficient fuel storage to operate for 2 days and nights shall be maintained at all times in the working fuel tank.

The Contractor shall provide either 1) a backup generator (s) or 2) support personnel available continuously while the generator (s) is operating. The backup generator (s) shall comply with all specifications in these special provisions. The Contractor shall provide any and all switching and control equipment required. All support personnel shall perform inspections of the generator (s) and the load at least once every hour while the generator (s) is in operation. The generator inspector shall be qualified to trouble shoot and repair any problems that may arise with the load and or the generator (s). At no time shall any part of the active load be without power for more than 15 minutes.

The generator (s) shall be 277/480 volt three phase four wire. Frequency regulation shall be +/- 3 hertz maximum when changing from no load to full load. Voltage regulation shall be +/- 2 percent maximum when changing from no load to full load. Steady state frequency variation shall not exceed +/- 0.3 hertz of mean value for all constant loads. Steady state voltage variation shall not exceed +/- 1 percent of mean value for all constant loads. The generator (s) shall be capable of supplying loads with a power factor of 80% and total harmonic distortion of at least 20% while maintaining all other specifications.

The generator (s) shall be capable of supporting two load levels (day and night). The day load level shall be 20 kVA at 90% power factor minimum, and the night load level shall be 62 kVA at 90% power factor minimum. If the Contractor chooses to use the generator (s) to operate construction equipment simultaneously with the electrical facilities, then the generator (s) capacity shall be increased by 120% of the full load wattage or VA of the additional equipment.

The generator (s) shall comply with any and all federal, state, and local laws and regulations concerning noise, fuel storage and usage, environmental, electromagnetic radiation, or other requirements. The Contractor shall be responsible for the clean up and repair to the original condition of any property or facilities soiled or damaged by the generator (s) or related equipment.

10-3.21 NUMBERING ELECTRICAL EQUIPMENT

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

10-3.22 PAINT REMOVAL, PRIMING AND PAINTING

Attention is directed to the sections under "Clean and Paint Structural Steel" section elswhere in these special provisions which are applicable to paint removal, priming and painting. All electrical equipment and materials being installed, removed, relocated, or otherwise modified shall comply with all the applicable sections of the "Clean and Paint Structural Steel" Special Provisions pertaining to this type of work.

Full compensation for paint removal, priming and painting shall be considered as included in the contract prices paid for the various contract items of work and no additional compensation will be allowed therefor.

10-3.23 PERMANENT REMOVAL OF EXISTING EQUIPMENT

For the purpose of these special provisions, the permanent removal of existing equipment shall fall into two categories:

1) When the equipment is to be salvaged, and
2) When the equipment is to become the property of the Contractor.

The removal of equipment for salvage is covered elsewhere in these special provisions, and in the Standard Specifications. This section of the special provisions discusses only the equipment and materials that are to become the Contractor's property.

The Contractor shall be responsible for the removal of equipment and related materials as depicted on the plans in the manner specified governing the removal of equipment for salvage, Also, the removal, transportation, and storage shall be in accordance with the laws and regulations governing the handling of materials coated with lead paint, and other toxic and hazardous materials as required.

The Contractor shall verify any and all circuits in the area of work prior to the removal of any conductor, cable, or related device or equipment. It is possible that conductors or cables depicted to be removed on the plans are still in use by unknown systems. Some of these systems may be 480-volt systems, and other systems may be of critical importance to the safe operation of the bridge.

The Contractor shall be responsible for coordinating with the Engineer and other State forces any assistance that may be required in verifying cable and conductor use. The Contractor shall request assistance from the Engineer three working days prior to the date any assistance may be required. The Contractor is responsible for having any and all of the tools and equipment that he/she may need for verification or testing readily available. If the Contractor is not substantially prepared to perform the necessary testing or verification upon the arrival of the State forces, then the State forces may choose to leave. It is the responsibility of the Contractor to properly utilize the assistance of the State forces. The Engineer shall have the final determining say as to whether the Contractor is adequately prepared, or in any disputes in this matter whatsoever.

Some of the existing equipment and materials to be removed may have considerable value. Information concerning existing systems to be removed is provided in the plans to the extent that the information is known. It is the Contractor’s responsibility to determine the value, if any, from this information alone.

The lump sum price shall include any and all work discussed in this special provision including the value of the materials that are to become the property of the Contractor. No additional compensation will be allowed for any reason concerning the removal, storage, or disposal of existing equipment.

10-3.24 REMOVING, REINSTALLING OR SALVAGING ELECTRICAL EQUIPMENT

All salvaged electrical materials except items listed below shall be hauled to Caltrans Electrical Maintenance Station, 30 Richard Street, San Francisco, CA 94134, (415) 330-6509, and stockpiled. The Beale Street 15 kV circuit breaker, 225 kVA transformer, and fusible switch shall be hauled to Caltrans Electrical Maintenance storage facility located in the Mole substation, which is located in Oakland California, south of the Bay Bridge, and west of the Bridge Toll Plaza near the Bridge take-off; (510) 286-1092.

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

10-3.25 DISPOSING OF ELECTRICAL EQUIPMENT

All ballasts and all fluorescent lamps shall be disposed of in accordance with California Department of Health Services Regulations set forth in Title 22, Division 4, Chapter 30, of the California Code of Regulations (CCR).

All existing equipment on the bridge are coated with lead bearing paint. Disposal of these devices shall be handled in accordance with California Department of Health Services Regulations set forth in Title 22, Division 4, Chapter 30, of the California Code of Regulations.

Ballasts which contain polychlorinated biphenyl (PCB) are designated extremely hazardous wastes, and fluorescent tubing and mercury lamps are designated hazardous wastes under Article 9, Section 66680 of Title 22, Chapter 30 (CCR).

When there are 25 or more fluorescent lamps in combination on the project, to be disposed of, they shall be treated as recyclable hazardous waste and shall be recycled within the State of California in conformance with Article 12, Chapter 30 of Title 22 (CCR) by a currently certified recycler such as but not limited to:

1. Exceltrans Inc.,
   P.O. Box 866
   Benicia, CA 94510
   Telephone No. (707) 745-8907

2. Roberts Enterprises
   2021 South Myrtle Avenue
   Monrovia, CA 91016
   Telephone No. (818) 303-2053

The Contractor shall package and ship recyclable hazardous waste via a currently certified hauler in conformance with Article 12, Chapter 30 of Title 22 CCR and all other applicable local, State, and Federal regulations.

The Contractor shall furnish the Engineer with a statement as to which certified hauler and which certified recycler he proposes to utilize, together with a copy of the recycler's interim status document and/or a copy of the variance letter from the Department of Health Services. Said statement shall be furnished within 15 calendar days after the contract has been approved by the Attorney General.

The State assumes generator responsibility for these wastes. The Engineer will prepare the Hazardous Waste Manifest for Shipment.

Full compensation for hauling, stockpiling, and disposal of fluorescent tubing and mercury lamps shall be considered as included in the contract price paid for the electrical item involved and no additional compensation will be allowed therefor.

10-3.26 PAYMENT

The contract lump sum price paid for the following items shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in installing, modifying or removal of said items, complete in place, including paint removal, priming and painting of said items, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer:

1. Lower Deck Lighting (Sterling Substation to SFA)
2. Lower Deck Lighting (SFA to Pier W-2)
3. Lower Deck Lighting (Pier W-2 to Pier W-3)
4. Lower Deck Lighting (Pier W-3 to Pier W-5)
5. Lower Deck Lighting (Pier W-5 to Pier W-6)
6. Lower Deck Lighting (Pier W-6 to YBIA)
7. Lower Deck Lighting (YBI Utility Tunnel)
8. Lower Deck Lighting (Sterling Substation)
9. Lower Deck Lighting (Pier W-4 Substation)
10. Lower Deck Lighting (YBI Substation)
11. Bridge Tower Navigation Lighting (Modification)
12. Magnetic Detector Modifications
13. CCTV Camera Cables (Modification)
14. Bridge Phone system Modifications
15. NAVL Modifications
16. Existing Lighting Equipment Removal
17. Electrical Facilities Modifications (SFA to W-1)
18. Modification from Damper Work at SFA and YBIA
19. Utility Platforms, Camera and Old Call Box System Modifications
20. Upper Deck Lighting Foundation Modifications
21. Lighted Sign, Continuous Span Chord Work, RTU Feeder, Truss Verticals Modifications.
22. Modification from Upper Chord Work
23. Spares
24. South Pier W-4 Modification
25. North Pier W-4 Modification
26. 15KV Modifications

Full compensation for scaffolding or rigging and rental electrical equipment required to perform electrical work shall be considered as included in the contract lump sum price paid for the electrical involved and no additional compensation will be allowed therefor.

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

SECTION 10-4 SEISMIC MONITORING ELECTRICAL SYSTEM

10-4.01 GENERAL

SCOPE.--This work shall consist of installing the seismic monitoring electrical system work in accordance with the details shown on the plans, the provisions in Section 86, "Signals, Lighting and Electrical Systems" of the Standard Specifications, the provisions in Chapter 6, "Specifications for Cabinet Models 332, 334 and 336", of the Traffic Signal Control Equipment Specifications, the Standard Plans, 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 shown on the plans.

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

Order of work.--

The time to start and perform 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 Section 8-1.01, "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 after pre-job meeting with California DMG personnel:

FBA pigtails
Seismic sensor mounting plates
"Bishops Hat" Downhole Specially formed sealed cap
Seismic Recorder No. 2 cabinets

The Contractor shall notify the Engineer in writing not less than 20 working days in advance when the Contractor wants the DMG to deliver the State Furnished material to the Contractor.

State-furnished and installed material.--

The Contractor shall notify the Engineer in writing at least 30 working days in advance when the Contractor wants The California Division of Mines and Geology (DMG) to install and test their equipment as specified elsewhere in these special provisions. The following seismic sensors and recorders will be furnished and installed by the State:

Downhole seismic sensors complete with cable to surface
Seismic sensors
Seismic recorders
Displacement sensor

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 coductor numbers.

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

Seismic Sensor Cable
Telephone cable
Interconnect Cable
Gutter
Junction boxes (Cast and NEMA Type 4X SST)
Seismic sensor enclosures (Cast and NEMA Type 4X SST)
Pull boxes
Downhole box
GFCI Receptacles
Circuit breakers
Disconnect switches
Seismic Recorder cabinets
Manhole

Access and Contractor assistance.--After all Contractor supplied equipment, conduit and cable has been installed, the Contractor shall provide DMG personnel 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 or 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 the DMG will meet with the Engineer and the Contractor at the job site to work out a mutually agreeable schedule.

1. Seismic recorder locations (3 Total):

   a) DMG will need ready access to the recorder cabinets prior to their installation for the purpose of measuring and preparing to mount the recorders into the cabinets.

   b) DMG will need approximately 3 days access per recorder location to install and wire the recorders.

   c) DMG will also need access to each recorder location during the installation and testing of the seismic sensors wired to that specific recorder location.

   d) DMG will need approximately 3 days access per recorder location during the final system testing and any necessary troubleshooting and repair.

2. Normal seismic sensor enclosure locations:

   a) DMG will require approximately 30 minutes access time at each enclosure on a minimum of two occasions (installation and operational testing) to accomplish their work.

3. Downhole (normal and pile cap) and Free field locations:

   a) DMG will require approximately 1/2 day access time for each downhole and free field location plus two additional days for wiring and testing.

Testing

After the complete installation of the Seismic Monitoring Electrical System by both the Contractor and California Division of Mines and Geology (DMG), the complete system will be tested by California Division of Mines and Geology 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, and/or repaired as required at the contractor's expense, and the complete system shall be retested. If problems occur with State installed equipment, it will be replaced, or repaired as required, and retested all at the State's expense.

CONDUITS AND FITTINGS.--

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

Rigid steel conduit shall be used unless otherwise shown on the plans or specified in these special provisions.

Unless otherwise specified or shown on the plans, liquid-tight flexible metal conduit shall be used on the bridge at the locations shown on the plans.

PVC coated rigid steel conduit shall be used on the pile caps and piers to a height 20 feet above the pile cap. This conduit shall be installed with "clamp backs" to space conduit off the concrete surface.

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.

Conduit shall be concealed in the Paint Facility building. All other conduits shall be exposed, unless otherwise shown on the plans.

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

Locations of conduit runs shall be planned in advance of the installation and coordinated with the seismic retrofit work in the same areas and shall not unnecessarily cross other conduits or pipes, nor block access to mechanical or electrical equipment.

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 or bridge structures using specified fasteners, clamps and hangers.

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

Multiple conduit runs shall be supported with construction channel secured to the 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.

All floor and wall penetrations shall be sealed water-tight.

Conduit terminations.--Rigid steel conduits shall be securely fastened to cabinets, boxes and gutters using 2 locknuts and insulating metallic bushing connectors. Conduit terminations at exposed weatherproof enclosures and cast metal boxes shall be made watertight using weatherproof hubs.

Grounding bushings with bonding jumpers shall be installed on all type of conduits terminating at concentric knockouts.

CABLES AND CONDUCTORS .--

Cables.--

Seismic Sensor cable.--Seismic Sensor cable, SSC, shall be four (4) twisted pairs stranded tinned copper conductors, AWG #22 (7 x 30 strands), insulation 0.007 inch thick, individually shielded pairs with an aluminum-polyester shield and AWG #22 stranded tinned copper drain wire for each pair, overall nominal outside diameter of 0.3 inch or less and outer jacket of 0.009 inch thick. Cable shall be instrument cable, NEC rated CLP2 plenum cable rated for 150°C. Cable shall be similar to Beldon 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 United 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 sensor enclosures to the recorder cabinets as shown on the plans.

Telephone cable.--Telephone cable shall be waterproof filled-sheath, ISDN rated cable with four (4) twisted pairs, individually shielded stranded conductor, minimum AWG #22 tinned copper, polyethylene insulated, with a foil aluminum-polyester shield, and chrome PVC jacket rated for 300 Volts. Cable spools shall be of sufficient length to allow the cables to be installed without splices from Pacific Bell service point to the three seismic recorders.

Interconnect cable.--Interconnect cable, IC, shall be EIA RS-485 Applications cable, Plenum type, NEC rated CL2P for temperature of 150 degrees C. Cable shall be similar to Belden cable #9844 but plenum rated. The cable shall have eight (8) tinned copper, insulated conductors (4 twisted pairs). Overall aluminum-polyester shield and 24 AWG stranded tinned copper drain wire. Overall tinned copper braid shield (90% coverage). Overall nominal O.D. of 0.35 inches or less, with outer jacket of 0.009 inches 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 United 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 conform to section 86-2.08 “Conductors” of the Standard Specifications.

Wire connections 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 type.

Conductor and cable installation.--Conductors and cables 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 and cables that insulation is not damaged. An approved non-petroleum base and insulating type pulling compound shall be used as needed.

Conductor identification.--The neutral and equipment grounding conductors shall be identified as follows:

Neutral conductor shall have a white or natural gray insulation except that conductors No. 4 and larger may be identified by distinctive white marker such as paint or white tape at each termination.

Equipment grounding conductor shall be bare or insulated. If insulated, equipment grounding conductors shall have green or green with one or more yellow stripes insulation over its entire length except that conductors No. 4 and larger may be permanently identified by distinctive green markers such as paint or green tape over its entire exposed insulation.

Feeder and branch circuit ungrounded 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
120/240V-Single phase	Black, blue

Where one or more branch circuit enters or leaves a conduit, panel, gutter, or junction box, each conductor shall be identified by its panelboard and circuit number. 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. Self-laminating wrap around type, printable, transparent, permanent heat bonding type thermoplastic film markers.
3. Pre-printed, white, heat-shrinkable tubing.

Seismic sensor cable identification.--Each seismic sensor cable shall be identified with the cable number shown on the plans at each termination and wherever accessible. at each junction box and pull box. Identification shall be made with one of the methods specified under "Conductor Identification" elsewhere in these special provisions.

ELECTRICAL BOXES.--

Unless otherwise shown or specified, all seismic junction boxes shall be NEMA Type 4X SST junction boxes. Seismic cast metal junction boxes shall be installed at the locations shown on the plans. Both type of boxes shall be as specified in these special provisions.

Seismic cast metal junction box.--Seismic 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 cast inscription "SEISMIC JUNCTION BOX" in 1" high letters.

Seismic NEMA Type 4X SST junction and pull box.--Seismic NEMA Type 4X SST junction box and pull 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.

Seismic recorder cabinets.--Seismic recorder No. 3 cabinet shall be type 1B cabinet conforming to Section 2, "Housing Requirements" in Chapter 6, "Specifications for Cabinet Models 332, 334 and 336", of the Traffic Signal Control Equipment Specifications with the following exceptions:

Paragraph 6.2.1 is amended to read:

The housing shall include, but not be limited to, the following:

Enclosure	Hinges and Door Catches
Doors	Gasketing
Latches/Locks	Cage supports

Paragraph 6.2.4 is amended to read:

The housing ventilation including intake, exhaust and filtration are as follows:

Paragraphs 6.2.4.3 and 6.2.4.4 shall be deleted.

In addition, the police panel and cabinet cage are not required.

Cabinet shipping requirements - The cabinet shall be delivered mounted on a plywood shipping pallet. The pallet shall be bolted to the cabinet base. The cabinet shall be enclosed in a slipcover cardboard packing shell. The housing doors shall be blocked to prevent movement during transportation.

All bolts, nuts, washers, screws (size 8 or larger), hinges and hinge pins shall be stainless steel unless otherwise specified. The cabinet shall have 4 spacer brackets installed at two heights as directed by the engineer. The cabinet shall come with all mounting hardware required for installation. The cabinet shall be installed as shown in the plans and as recommended by the manufacturer.

Seismic recorder No.1 cabinet shall be similar except shall consist of two cabinets of the same size mounted side by side as shown on the plans. Seismic recorder No. 2 cabinets will be State-as shown on the plans.

Gutter.--Gutter at seismic recorder No. 2 shall be steel, NEMA Type 1 without knockouts and with dimensions as shown on the plans.

Seismic sensor enclosure.--All Seismic sensor enclosures, except sensor enclosure Type 6, shall be stainless steel NEMA Type 4X, 316 or 316L, hinged cover box of dimensions shown on the plans. A nameplate with the inscription "SEISMIC ENCLOSURE #" in 1" high letters shall be installed on the front cover (the # shall correspond to the # of the enclosure shown on the plans).

The back side of the enclosure shall be a flush and smooth surface. The enclosure shall be Hoffman, catalog # A-1412CHNFSS6; -Circle AW, catalog # 14126-4xschc (without upper lower mounting flanges and with padlock hasp similar to catalog # APLKJIC; or equal.

Seismic sensor enclosure, Type 6.--Seismic sensor enclosure Type 6, 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" 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 six foot depth for extended periods. 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 one inch conduit connector centered between mounting lugs on one side only. The enclosure shall also have a mounting button drilled and tapped for 1/4"x20" located in the center (±1/8") of the inside bottom of the enclosure. The enclosure shall be O-Z Gedney, catalog # YF-1212.6-SUB, with raised cast inscription “SEISMIC ENCLOSURE #” in 1" high letters on the cover (the # shall correspond to the # of the enclosure shown on the plans), mounting button P/N 1 MBT (installed in the center inside the bottom of the box), mounting lugs P/N 4 ML1816 attached to each side, and one P/N BDT 100 conduit connector hole centered between mounting legs on one side; Crouse Hinds, catalo # WCB121208-1000G (except box shall be 6" deep), with mounting straps and raised cast inscription “SEISMIC enclosure #” in 1" high letters on the cover (the # shall correspond to the # of the enclosure shown on the plans), mounting pad blind tapped for 1/4"x20" installed in the center inside the enclosure, and one drilled and tapped (NPT) 1" (conduit) hole centered between mounting straps on one side only; or equal.

Underground pull box.--Underground pull box shall be high density reinforced concrete traffic rated box with the size shown on the plans.

Underground Pull box installation.--Electrical underground pull box covers or lids shall be marked "ELECTRICAL." The bottom of pull boxes shall be bedded in 6 inches of clean, crushed rock or gravel and shall be grouted with 1 1/2-inch thick grout prior to installation of conductors. Grout shall be sloped to a one-inch PVC pipe drain. Conduit shall be sealed in place with grout.

Top of pull boxes shall be flush with surrounding grade or top of curb. In unpaved areas where pull box is not immediately adjacent to and protected by a concrete foundation, pole or other protective construction, the top of pull box shall be set at plus 0.1 feet above surrounding grade.

Downhole and free field junction box.--Downhole and free field junction box shall be the same as seismic sensor enclosure Type 6, except the box size shall be 14"x8"x6"D. Cast mounting lugs shall be attached on 8" sides, minimum of two lugs each side. One each bossed, drilled and tapped (NPT) hole to accept a two inch conduit connector centered between mounting lugs on one side only. One each bossed, drilled and tapped (NPT) hole to accept a one inch water tight strain relief connector per down hole cable as required. These holes are to be centered between the lid and the bottom along a 14" side of the box. The box shall be O-Z Gedney, Catalog No. YF-140806-SUB with mounting lugs, Catalog No. 4ML1816, one hole, Catalog No. BDT200, and appropriate number of holes for down hole cables, Catalog No. BDT100; Crouse-Hinds, Catalog No. WCB120806-3-0000G0(****)00 (except box shall be 14" long); or equal. In the Crouse Hinds box catalog number the ****'s represent the appropriate number of conduits required for a given box.

Manhole.--Manhole for the free field shall be 5'x5' (outside dimensions) x3' deep with walls, bottom and top thicknesses as shown on the plans. The manhole shall be precast or cast-in-place concrete designed for H-20-44 bridge loading. A 3' square hole shall be cut out or formed within the bottom of the manhole. The frame and cover shall be cast iron and cover shall have provisions for hold down bolts. Bolts shall be included. Conduits terminating inside the manhole shall end with bushings specified elsewhere in these special provisions. A cable pulling iron shall be installed in the wall opposite each conduit entrance. Manhole cover shall have engraved inscription "SEISMIC" in 1" high letters.

Manhole installation.--The top of the manhole shall be installed 1/2" above the finished grade in unpaved areas and flush with grade in paved area. Where conduits enter the manhole, the space around the conduits shall be grouted tightly or cast thru the bottom.

Downhole box.--Downhole box shall be high density reinforced concrete box having an inside diameter of 14 inches minimum. The box shall be designed for installation in heavy truck traffic areas. Box cover shall be cast iron with provisions for hold down bolts. Bolts shall be included. Box cover shall have engraved inscription "SEISMIC" in 1" high letters.

Downhole box installation.--Downhole box installation shall be the same as the manhole installation specified above.

Pile Cap downhole protective enclosure.--Pile cap downhole protective enclosure shall be a fibrelyte enclosure with a flanged bottom rim suitable for bolting to a horizontal surface. The enclosure shall have nominal dimensions of 17" x 30" x 18" deep. The lid shall be a bolt down type.

Pile Cap downhole protective enclosure installation.--Pile cap downhole protective enclosure installation shall be a shown on the plans.

RECEPTACLES AND SWITCHES.--

Duplex receptacles.--Duplex receptacles shall be NEMA Type 5-20R, 3-wire, 20-ampere, 125-volt AC, safety grounding, ivory color, specification grade receptacle suitable for wiring with stranded conductors.

Seismic recorder power disconnect --Seismic recorder power disconnect shall be 20-ampere, 120/277-volt AC, quiet type, specification grade, ivory color switch with silver cadmium alloy contacts. Switch shall be suitable for wiring with stranded conductors. Disconnect shall be mounted in a NEMA type 1 enclosure as shown on the plans.

MISCELLANEOUS MATERIALS.--

Anchorage devices--Anchorage devices shall be corrosion resistant toggle bolts, wood screws, bolts, machine screws, studs, expansion shields, and expansion anchors and inserts.

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

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

Electrical supporting devices--Electrical supporting devices shall be one hole conduit clamps with clamp backs, hot-dipped galvanized, malleable cast iron.

Construction channel shall be 1 5/8" x 1 5/8", 12-gage galvanized steel channel with 17/32 inch diameter bolt holes, 1 1/2 inches on center in the base of the channel.

Nameplates--Nameplates shall be laminated phenolic plastic with white core and black front and back. Nameplate inscription shall be in capitals 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 these special provisions.

10-4.02 TELEPHONE SERVICE

Utility connection.--The Contractor shall make all arrangements and obtain all permits and licenses required for the connection of the Integrated System Digital Network (ISDN) telephone service applicable to this project, shall furnish all labor and materials necessary for such extensions which are not performed or provided by the utility, and shall furnish and install any intermediate equipment required by the serving utilities.

Upon written request by the Contractor, the State will pay all utility permits, licenses, and connection charges directly to the utility. Such request shall be submitted not less than 15 days before service connections are required.

The costs incurred by the Contractor for the extension of utility beyond the limits shown on the plans, and in furnishing and installing any intermediate equipment required by the serving utility, will be paid for as an ordered change as provided for elsewhere in these special provisions.

Full compensation for any costs incurred by the Contractor to obtain the permits and licenses 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.

Installation details.--The Contractor shall submit complete service installation details to the serving utility for approval. Prior to submitting installation details to the serving utility, the Contractor shall have said drawings reviewed and stamped "APPROVED" by the Engineer. Submittals shall be approved by the serving utility prior to commencing work.

Installation of the telephone shall be in accordance with the requirements of the serving utility and as shown on the approved installation details.

10-4.03 MEASUREMENT AND PAYMENT

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

The contract lump sum price paid for seismic monitoring electrical system shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals (except state furnished materials and labor), and for doing all the work involved in furnishing and installing the seismic monitoring electrical system, complete in place, including transportation and storage of state furnished materials, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

SECTION 10-5. WATERLINE RETROFIT

10-5.01 GENERAL

The waterline, located on the Bay Bridge, is owned by the City of San Francisco and operated by the San Francisco Water Department (SFWD). The work on this pipeline will be administered by Caltrans as a part of the San Francisco-Oakland Bay Bridge Seismic Retrofit Project.

From Pier W-1 to the Yerba Buena Anchorage, the waterline expansion loops are to be retrofitted to accommodate the seismic retrofitting of the bridge. In addition, existing expansion joints on the waterline are to be replaced, and a new electrical conduit will be installed from Pier W-1 to the Yerba Buena Anchorage.

COORDINATION.--Attention is directed to Section "Cooperation" elsewhere in these special provisions regarding coordination with other State contracts within the limits of work under this contract.

MAINTAINING TRAFFIC.--The work on the waterline retrofit will require lane closures. The Contractor's attention is directed to Section "Maintaining Traffic" of these special provisions regarding lane closures.

APPROVALS.--Approval by the Engineer of the work on the waterline retrofit will be contingent upon the work and materials furnished and installed being satisfactory to the San Francisco Water Department.

SHUTDOWNS.--Continued operation of the waterline which supplies water to Yerba Buena and Treasure Island is necessary. In order to maintain service to the Island, shutdowns will be limited to 24 hours. After startup, following a shutdown, the waterline must remain in service for 48 hours to replenish depleted storage on the Island.

Draining and refilling of the waterline will be done by the SFWD. Because of the work necessary to drain and refill the line, the Contractor will be allowed a maximum of 2 shutdowns to do the waterline retrofit work.

SUBMITTALS.--Working drawings for the waterline retrofit work shall be submitted to the Engineer in accordance with the provisions in Section 5-1.02, "Plans and Working Drawings," of the Standard Specifications and these special provisions.

The Contractor shall submit to the Engineer for approval 12 copies of catalog cuts , working drawings and work procedures including, but not limited to, the following items:

1. Pipe and fittings.
2. Flexible joints.
3. Expansion joints.
4. Fabricated steel supports and braces
5. Electrical conduits and conduit supports
6. Pull boxes
7. Procedures for disinfecting and protecting pipe and fittings to be used in the waterline retrofit work.

The Contractor shall allow 3 weeks for the Engineer to review the submittals. If revisions are required, as determined by the Engineer, the Contractor shall submit revisions within 7 days. No work shall be performed on the waterline retrofit work until all submittals are approved by the Engineer. Upon approval, 8 additional copies shall be submitted to the Engineer with the required changes.

SALVAGE.--All pipe and fittings which must be removed to accomplish the retrofit work shall become the property of the Contractor. No salvage of materials will be required.

FUNCTIONAL TESTING.--The retrofitted waterline shall be pressure tested. The test pressure shall be 235 psi as measured at the expansion loop at Pier W-1.

DISINFECTION.--Pipe and fittings to be inserted into the existing pipeline for retrofit purposes shall be disinfected by the Contractor. Disinfection of the interior surfaces of the pipe and fittings shall be similar to the methods specified in AWWA Designation: C652-92, Section 4, Method 2. Longer sections of pipe where spraying is impractical shall be capped and filled with the chlorine solution, and then drained. Flushing of the pipe and fittings is not required. Immediately after chlorination, the ends of the pipe and fittings shall be sealed with a double thickness of minimum 10-mil polyethylene taped in place or in a length of minimum 8-mil polyethylene tubing with the ends sealed. The polyethylene sealing material shall be left in place until the pipe or fittings are ready to be installed.

Chlorination of the pipe and fittings shall be done at the Contractor's yard or staging area in the presence of an authorized SFWD representative unless otherwise approved by the Engineer.

10-5.02 PIPE, FITTINGS, AND VALVES

GENERAL.--All pipe, fittings, and valves shall be rated for a test pressure of 300 psi and a working pressure of 200 psi.

PRODUCTS.--

PIPE.--Pipe shall be welded steel conforming to AWWA C200 and AWWA M11, and shall be fabricated from ASTM A570, Grade 45 or A572, Grade 42. Pipe shall have an outside diameter of 10.75 inches and shall have a minimum wall thickness of 0.307 inches (Schedule 30).

FITTINGS.--Fittings shall be forged, conforming to ASTM A234, Grade WPB. Fitting wall thickness to match pipe. Bends shall be short radius unless otherwise shown on the Drawings.

LINING.--Pipe and fittings shall be cement-mortar lined in conformance with AWWA C205.

COATINGS.--Pipe, supports, valves, and fittings shall be primed and painted in accordance with the provisions of Section 59, "Painting," of the Standard Specifications.

JOINTS.--All joints shall be single-butt welded except where flanged joints are shown on the Drawings or otherwise specified herein.

FLANGED JOINTS.-- Flanged joints shall be Class 150 slip-on welding type rated for a minimum 200 psi working pressure with raised faces conforming to ANSI B16.5. Gaskets shall be non-asbestos conforming to the requirements of AWWA Designation: C207, suitable for use with raised face flanges.

Bolts and nuts shall conform to the requirements in Section 55, "Steel Structures," of the Standard Specifications. Bolt length and diameter shall be in accordance with ANSI B16.5.

FLEXIBLE JOINTS.-- Flexible joints shall be flanged, and shall swivel a minimum of 15 degrees in any direction from the centerline of the joint. The ball, case and gland shall be manufactured from a weldable medium carbon cast steel conforming to or exceeding the requirements of ASTM Designation: A148, Grade 80-40.

The gland ring shall have an enlarged bearing area and provide a spherical seat for the ball. After finished machining, the ball shall be rolled under pressure to increase the surface hardness of the sphere and to produce a smooth, mirror-like finish.

The ball joint shall be lubricated with a water resistant grease containing molybedenumdisulfide.

EXPANSION JOINTS.--Double end expansion joints shall have flanged ends and shall be furnished with limiting rods. The body shall be carbon steel conforming to AISI Designation: C1015-20, ASTM Designation: A283 or A285, Grade A PVQ. The slip pipes shall be carbon steel conforming to AISI Designation: C1015-20, ASTM Designation: A283 or A285, and shall be hard chrome-plated on a machined surface.

Gaskets shall be alternate square rings of lubricant impregnated fibrous packing and Grade 60 rubber compound to be resistant to oil, natural gas, acids, alkalies, aliphatic hydrocarbon fluids and water, suitable for a temperature range of 20^0 F to 212^0 F.

Limit rods and body studs, bolts and nuts shall be high strength, low alloy steel with heavy, semi-finished hexagon nuts.

The expansion joints shall be furnished with manufacturer installed anchor bases conforming to the details shown on the plans.

COMBINATION AIR RELEASE ASSEMBLIES.--Combination air release valves shall be suitable for water service and combine the operating features of both an air and vacuum valve and an air release valve. The air and vacuum portion of the valve shall automatically exhaust air during the filling of the pipeline and allow air to re-enter during draining. The air release portion of the valve shall automatically release entrained air that could accumulate in the system. The valve shall be rated at 300 psi. The float shall be guided by a stainless steel guide shaft, shall seal drip tight against a synthetic rubber seal and shall be of all stainless steel construction. The body shall be single body manufactured of cast iron, ductile iron or semi-steel with flanged inlet. The internal parts shall be of stainless steel or Buna-N rubber.

Shutoff (gate) valves shall be iron body, resilient seat, bronze mounted with flanged ends and non-rising stem in accordance with AWWA C 509. Valve shall be hand wheel operated, full port, fusion epoxy coated inside and rated for 200 psi cold water. Valve shall open when turning the hand wheel to the right (clockwise).

FABRICATED STEEL SUPPORTS AND FASTENERS.--Fabricated steel supports and welds shall be in conformance with the details shown on the plans, the provisions in Section 75, “Miscellaneous Metal” of the Standard Specifications, and these special provisions.

Bolts and nuts shall be in accordance with Section 55, "Steel Structures," of the Standard Specifications.

10-5.03 ELECTRIC CONDUIT AND APPURTENANCES

PRODUCTS.--

CONDUIT.--Provide rigid hot-dipped galvanized steel conduits with smooth walls. Conduit shall meet the requirements of ANSI C80.1 and UL6. A polypropylene cord pull line shall be provided in each conduit.

FITTINGS.--Fittings shall meet the requirements of UL 514B and shall be of the threaded galvanized type. Set screw types will not be permitted. Bushing and conduit hubs shall be malleable ireon with integral insulated throat. Conduit bodies shall be cast ferrous, sized as required by NFPA 70. Couplings shall be as subpplied by conduit manufacturer. Expansion fittings shall be factory fabricated, lateral movement type only.

END CAPS.--End caps shall snugly fit to the conduit. Caps shall have separate removable plugs matching the inner duct layout. Removable plugs shall have a connector for fastening the pull line.

BENDS.--At the Contractor's option, conduit bends shall be either polyvinyl chloride coated flexible steel or rigid galvanized steel as shown on the plans. Bends shall have a 4-foot bending radius with inner ducts and couplings matching the conduit. Rigid steel bends shall be factory fabricated.

SUPPORT AND FRAMING CHANNELS.--Support and framing channels shall be in conformance with the details shown on the plans, the provisions in Section 75, "Miscellaneous Metals," of the Standard Specifications and these special provisions.

PULL BOXES.--Electrical pull boxes shall be NEMA 250, Type 4X, 14-gauge conforming to ASTM Designation: A 240 and shall be furnished with an interior barrier. Pull box covers shall be hinged and provided with clamps. Hardware and machine screws shall be Type 316 stainless steel conforming to the requirements in ASTM Designation: A 167.

10-5.04 EXECUTION

GENERAL.-- All waterline retrofit work shall be coordinated with the work required for the bridge structure retrofit.

Contractor shall schedule required shutdowns with SFWD. Shutdown periods shall be in accordance with shutdowns as hereinbefore specified and shall be scheduled with SFWD a minimum of 3 working days before a planned shutdown.

Bolts, nuts and gaskets salvaged from the existing installation shall not be reused. Reconnection to existing flanges shall be made with new materials.

The Contractor shall provide temporary plugs which are to be inserted into the open end of any pipe during any period when no work is being done on the open end. Care shall be taken to insure that no debris is allowed to enter open ends of existing pipe at any time.

After the pipeline has been drained by SFWD, trapped water in sags within the work area shall be removed by the Contractor. Where possible, such water shall be captured and/or drained to a tank, and ultimately disposed of in the City of San Francisco's sanitary sewer system.

INSTALLATION OF PIPING.--Provide temporary hangers or cable supports as required to support existing pipeline where it is being lowered at expansion loops, or for insertion of new expansion joints.

FIELD CUTTING OF PIPE.--Cut pipe with pipe cutting device. Use care to avoid damage to pipe lining, remove and replace loosened, damaged, or broken lining. Bevel ends for butt welding.

FIELD WELDING (GENERAL).--The Contractor shall make any tests necessary to verify the type of the existing steel pipe, and be responsible for determining the proper grade and type of electrode and welding methods.

Field welding shall be in accordance with AWWA Designation: C206. Butt welds shall have complete penetration and fusion. Repair defective welds by chipping, grinding, flame gouging, or air-arc gouging.

FIELD WELDING OF EXISTING PIPE--Prior to field cutting of existing pipe which is to be field welded, the pipe shall be spot blast cleaned with abrasive blasting in conformance with Section 59-2.03, "Blast Cleaning," of the Standard Specifications. The pipe shall be blast cleaned back a minimum of 4 inches from the location for the new weld.

Abrasive used for blast cleaning shall not contain hazardous material.

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, except for silica sand.

Spot blasted areas of the pipe shall be primed and coated in accordance with the provisions of Section 59, "Painting," of the Standard Specifications.

WELDING OF FLANGES.--Shop or field welding of flanges shall be in accordance with the requirements of AWWA C207.

RETROFITTING OF EXPANSION LOOPS.--Remove existing 90 degree bends, spools, flexible joints, and connecting piping as shown on the Drawings. Cut pipe and install new flanges as required. Install new hangers and supports, lower pipeline and reconnect to existing. Note that the new 90 degree bends, flexible joints and connecting piping shall be the same overall length as the existing.

INSTALLATION OF NEW EXPANSION JOINTS.--Remove existing pipe as required to install new expansion joints, and field weld flanges to the pipe to receive the new expansion joint. The new joints should be installed so that the expansion portion of the joint is midway between open and closed at a temperature of approximately 60 degrees F.

ELECTRICAL CONDUIT INSTALLATION.--Install electrical conduits and appurtenances in accordance with the details shown on the plans and the provisions in Section 86-2.05C, "Installation," of the Standard Specifications.

ELECTRICAL CONDUIT EXPANSION JOINTS.--Place expansion joint midway between pull boxes, but not less than every 200 feet.

PULL BOXES.--Install pull boxes at the locations shown on the plans. Drill as necessary to connect conduits. Installation shall be plumb and level. The pull boxes are to be supported independently of the conduit. Connection to conduits shall be made in conformance with the conduit manufacturer's recommendation.

COATINGS FOR CONDUIT AND PULL BOXES.--Conduits, supports, and pull boxes shall be primed and painted in accordance with the provisions in Section 59, "Painting," of the Standard Specifications.

All exposed galvanized surfaces shall be prepared and painted in accordance with the provisions in Section 59-3, "Painting Galvanized Surfaces," of the Standard Specifications.

10-5.05 PAYMENT

The work performed under this Section "Waterline Retrofit" will be paid for as follows:

Retrofit and Lower Expansion Loops .....lump sum
Replace Expansion Joints .....lump sum
Install Electrical Conduit .....lump sum

The contract lump sum price paid for retrofit and lower expansion loops shall include full compensation for furnishing and installing all labor, materials, tools, equipment, and incidentals for doing all the work involved in retrofitting and lowering expansion loops, 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 replace expansion joints shall include full compensation for furnishing and installing all labor, materials, tools, equipment, and incidentals for doing all the work involved in replacing expansion joints, 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 install electrical conduit shall include full compensation for furnishing and installing all labor, materials, tools, equipment, and incidentals for doing all the work involved in electrical conduit installation, 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 spot blast cleaning and painting shall be considered as included in the contract lump sum prices paid for the various contract items under waterline retrofit work and no additional compensation will be made therefor.

Full compensation for furnishing and installing all miscellaneous metal and expansion devices used for steel supports and fasteners shall be considered as included in the contract lump sum prices paid for the various contract items under waterline retrofit work and no separate payment will be made therefor.

Full compensation for the support adjustment at Tower W6 shall be considered as included in the contract lump sum price paid for retrofit and lower expansion loops and no separate payment will be made therefor.

Full compensation for furnishing and installing air valves shall be considered as included in the contract lump sum price paid for retrofit and lower expansion loops and no separate payment will be made therefor.

SECTION 11. (BLANK)

SECTION 12. (BLANK)

SECTION 13. RAILROAD RELATIONS AND INSURANCE

SECTION 13-1. RELATIONS WITH RAILROAD COMPANY

13-1.01 GENERAL.--The Contractor's attention is directed to the track and right of way of the San Francisco Minicipal Railway Company, hereinafter referred to as "Railroad," at State Route 80, at the West Bay Superstructure.

13-1.02 RAILROAD REQUIREMENTS .--The Contractor shall not pile or store any materials, nor park any equipment, when not in use, any closer than 15'-0" to the center of the nearest Railroad track.

The details of construction affecting Railroad property not included in the contract plans and any infringement on the above clearance due to the Contractor's operations, shall be submitted to the Railroad for approval before such work is undertaken.

When working within thirty-five (35) feet of the Railroad's grade crossing, the Contractor shall determine the schedule of train movements so that he can perform his work at such times that will not interfere with the operations of the Railroad. If necessary to suspend light rail service during demolition/reconstruction, the most advantageous times for the Railraod would be on Saturdays and Sundays, when service levels are at their lowest and the impact on the Railroad passengers are least. The Railroad will accomodate the contractor any other day if necessary, and the responsibility of contacting the Railroad will be as described in 13-1.04.

The Contractor shall, upon completion of the work covered by this contract, to be performed by Contractor upon the premises of Railroad, promptly remove from the premises of the Railroad all of Contractor's tools, implements and other materials, whether brought upon said premises by said Contractor or any Subcontractor, employee or agent of Contractor or any Subcontractor, and cause said premises to be left in a clean and presentable condition.

13-1.03 Protection of Railroad Facilities:-

(1) Railroad representatives, conductors, flagmen or watchmen will be provided by Railroad to protect its facilities, property and movements of its trains or engines.

(a) When any part of any equipment is standing or being operated within 10 feet, measured horizontally from centerline of any track on which trains may operate, or when any erection or construction activities are in progress within such

(b) For any excavation below elevation of track subgrade if, in the opinion of Railroad's representative, track or other railroad facilities may be subject to settlement or movement

(c) During any clearing, grubbing, grading, or blasting in proximity to Railroad which, in the opinion of Railroad's representative, may endanger railroad facilities or operations.

(d) During any of the Contractor's operations when, in the opinion of Railroad's representatives, railroad facilities, including, but not limited to, tracks, buildings, signals, wire lines or pipe lines, may be endangered

(2) The cost of inspection , flagging or suspending light rail service by Railroad during the period of constructing that portion of the project located on or near Railroad property, as deemed 0ecessary for the protection of Railroad's facilities and trains, will be borne by the State for a period of 100 consecutive calendar days beginning on the date work commences on or near property of Railroad. The Contractor shall pay to the State liquidated damages in the sum of $500 per day for each day in excess of the above 100 days the Contractor works on or near Railroad property, and which requires flagging protection of Railroad's facilities and trains.

13-1.04 WORK BY RAILROAD--Work by the Railroad will be on as-needed bases. The State Engineer will be directly responsible for contacting the Railroad for any work or assistance the contractor may need before commencing with his work under this project. The contact person for the Railroad will be Mr. Len Olson at - (415) 554-9286. The Railroad will receive at least 48 hours notification from the State Engineer for any work or assistance request. The Railroad will provide flagging and Inspection work whenever contractor is working within thirty-five (35) feet of the Railroad tracks.

13-1.05 LEGAL RELATIONS--The provisions of this Section, "Relations with Railroad Company," and the provisions shall inure directly to the benefit of the Railroad.

SECTION 13 -2. RAILROAD PROTECTIVE INSURANCE

The term "Railroad" shall be understood to mean the San Francisco Minicipal Railway Company.

In addition to any other form of insurance or bonds required under the terms of the contract and specifications, the Contractor will be required to carry insurance of the kinds and in the amounts hereinafter specified.

Such insurance shall be approved by the Railroad before any work is performed on Railroad's property and shall be carried until all work required to be performed on or adjacent to the Railroad's property under the terms of the contract is satisfactorily completed as determined by the Engineer, and thereafter until all tools, equipment and materials have been removed from Railroad's property and such property is left in a clean and presentable condition.

The insurance herein required shall be obtained by the successful bidder and he or she shall furnish the Agreement Section, Structures, Engineering Services Center, California Department of Transportation, State of California, 1801 30th Street, Sacramento, California 95816, with two completed certificates, in the form attached hereto, signed by the insurance company or its authorized agent or representative, reflecting the existence of each of the policies required by 1 and 2 below including coverage for X, C and U and completed operations hazards, the original policy of insurance and one certified copy thereof required by 3 below. The Engineer will convey one of the certificates of policy certifying 1 and 2 and the original policy of insurance required by 3 to Railroad upon receipt from successful bidder. Engineer will notify successful bidder whether Railroad approves the insurance policies.

Certificate of insurance shall guarantee that the policy under 1 and 2 will not be amended, altered, modified or cancelled insofar as the coverage contemplated hereunder is concerned, without at least thirty (30) days notice mailed by registered mail to the Engineer and to Railroad. Full compensation for all premiums which the Contractor is required to pay on all the insurance described hereinafter shall be considered as included in the prices paid for the various items of work to be performed under the contract, and no additional payment will be made therefor or for additional premiums which may be required by extensions of the policies of insurance.

The approximate ratio of the estimated cost of the work over or under or within 50 feet of Railroad's tracks to the total estimated cost is 0.01. Approximate daily train traffic is about 150 trains a day.

1. Contractor's Public Liability and Property Damage Liability Insurance

The Contractor shall, with respect to the operations he performs within or adjacent to Railroad's property, carry regular Contractor's Public Liability and Property Damage Liability

Insurance providing for the same limits as specified for Railroad's Protective Public Liability and Property Damage Liability insurance to be furnished for and in behalf of Railroad as hereinafter provided.

If any part of the work within or adjacent to Railroad's property is subcontracted, the Contractor in addition to carrying the above insurance, shall provide the above insurance on behalf of the subcontractors to cover their operations.

2. Contractor's Protective Public Liability and Property Damage Liability Insurance.

The Contractor shall, with respect to the operations performed for him by subcontractors who do work within or adjacent to Railroad's property, carry in his own behalf regular Contractor's Protective Public Liability and Property Damage Liability Insurance providing for the same limits as specified for Railroad's Protective Public Liability and Property Damage Liability Insurance to be furnished for and on behalf of Railroad as hereinafter provided.

3. Railroad's Protective Public Liability and Property Damage Liability Insurance

The Contractor shall, with respect to the operations he performs within or adjacent to Railroad's property or that of any of his subcontractors who do work within or adjacent to Railroad's property perform, have issued and furnished in favor of Railroad, policy or policies of insurance in the Railroad Protective Liability Form as hereinafter specified.

Railroad Protective Liability Form

_____

(Name of Insurance Company) DECLARATIONS

Item 1. Named Insured:

San Francisco Minicipal Railway Company
949 Presidio Avenue,
San Francisco, California 94115

Item 2. Policy Period: From _____to _____ 12:01 a.m., Standard Time, at the designated job site as stated herein.

Item 3. The insurance afforded is only with respect to such of the following coverages as are indicated in Item 6 by specific premium charge or charges. The limit of the company's liability against such coverage or coverages shall be as stated herein, subject to all the terms of this policy having reference thereto.

Coverage	Limits of Liability Each Occurrence	Aggregate
A Bodily Injury Liability	$500,000	$1,000,000
B Property Damage Liability and	Combined Single Limit	for Coverages A, B & C
C Physical Damage to Property		

Item 4. Name and Address of Contractor:

Item 5. Name and Address of Governmental Authority for whom the work by the Contractor is being performed: State of California, acting by and through its Department of Transportation, P.O. Box 942874, Sacramento, California 94274-0001.

Item 6. Designation of the Job Site and Description of Work:

FOR CONSTRUCTION ON IN THE CITY AND COUNTY OF SAN FRANCISCO AT SAN FRANCISCO-OAKLAND BAY BRIDGE FROM 0.2 MILE WEST OF SAN FRANCISCO ANCHORAGE TO EAST END OF YEBRBA BUENA TUNNEL

Premium Bases	Rates per $100 of Cost		Advance Premiums	
	Coverage A	Coverages B & C	Coverage A	Coverages B & C
Contract Cost	$	$	$	$
Rental Cost	$	$	$	$

Countersigned_____19_____by_____

_____
Title

POLICY

_____
(Name of Insurance Company)

A _____ insurance company, herein called the company, agrees with the insured, named in the declarations made a part hereof, in consideration of the payment of the premium and in reliance upon the statements in the declaration made by the named insured and subject to all of the terms of this policy:

INSURING AGREEMENTS

I. Coverage A--Bodily Injury Liability.

To pay on behalf of the insured all sums which the insured shall become legally obligated to pay as damages because of bodily injury, sickness, or disease, including death at any time resulting therefrom, hereinafter called "bodily injury," either (1) sustained by any person arising out of acts or omissions at the designated job site which are related to or are in connection with the work described in Item 6 of the declarations, or (2) sustained at the designated job site by the Contractor or any employee of the Contractor, or by any employee of the Governmental Authority specified in Item 5 of the Declarations, or by any designated employee of the insured whether or not arising out of such acts or omissions.

Coverage B--Property Damage Liability.

To pay on behalf of the insured all sums which the insured shall become legally obligated to pay as damages because of physical injury to or destruction of property, including loss of use of any property due to such injury or destruction, hereinafter called "property damage," arising out of acts or omissions at the designated job site which are related to or are in connection with the work described in Item 6 of the declarations.

Coverage C--Physical Damage to Property.

To pay for direct and accidental loss of or damage to rolling stock and their contents, mechanical construction equipment, or motive power equipment, hereinafter called "loss," arising out of acts or omissions at the designated job site which are related to or are in connection with the work described in Item 6 of the declarations; provided such property is

owned by the named insured or is leased or entrusted to the named in-sured under a lease or trust agreement.

II. Definitions.

(a) **Insured**.--The unqualified word "insured" includes the named insured and also includes any executive officer, director or stockholder thereof while acting within the scope of his duties as such.

(b) **Contractor.--**The word "contractor" means the Contractor designated in Item 4 of the declarations and includes all subcontractors of said Contractor but shall not include the named insured.

(c) **Designated employee of the insured.--**The words "designated em-ployee of the insured" mean:

(1) any supervisory employee of the insured at the job site,

(2) any employee of the insured while operating, attached to or engaged on work trains or other railroad equipment at the job site which are assigned exclusively to the Contractor, or

(3) any employee of the insured not within (1) or (2) who is specifically loaned or assigned to the work of the Contractor for prevention of accidents or protection of property, the cost of whose services is borne specifically by the Contractor or by governmental authority.

(d) **Contract.--**The word "contract" means any contract or agreement to carry a person or property for a consideration or any lease, trust or interchange contract or agreement respecting motive power, rolling stock or mechanical construction equipment.

III. Defense, Settlement, Supplementary Payments.

With respect to such insurance as is afforded by this policy under Coverages A and B, the company shall:

(a) defend any suit against the insured alleging such bodily injury or property damage and seeking damages which are payable under the terms of this policy, even if any of the allegations of the suit are groundless, false or fraudulent; but the company may make such investigation and settlement of any claim or suit as it deems expedient;

(b) pay, in addition to the applicable limits of liability:

(1) all expenses incurred by the company, all costs taxed against the insured in any such suit and all interest on the entire amount of any judgment therein which accrues after entry of the judgment and before the company has paid or tendered or deposited in court that part of the judgment which does not exceed the limit of the company's liability thereon;

(2) premiums on appeal bonds required in any such suit, premiums on bonds to release attachments for an amount not in excess of the applicable limit of

liability of this policy, but without obligation to apply for or furnish any such bonds;

(3) expenses incurred by the insured for such immediate medical and surgical relief to others as shall be imperative at the time of the occurrence;

(4) all reasonable expenses, other than loss of earnings, incurred by the insured at the company's request.

IV. Policy Period, Territory.

This policy applies only to occurrences and losses during the policy period and within the United States of America, its territories or possessions, or Canada.

EXCLUSIONS

This policy does not apply:

(a) to liability assumed by the insured under any contract or agreement except a contract as defined herein;

(b) to bodily injury or property damage caused intentionally by or at the direction of the insured;

(c) to bodily injury, property damage or loss which occurs after notification to the named insured of the acceptance of the work by the governmental authority, other than bodily injury, property damage or loss resulting from the existence or removal of tools, uninstalled equipment and abandoned or unused materials;

(d) under Coverages A (1), B and C, to bodily injury, property damage or loss, the sole proximate cause of which is an act or omission of any insured other than acts or omissions of any designated employee of any insured;

(e) under Coverage A, to any obligation for which the insured or any carrier as his insurer may be held liable under any workmen's compensation, unemployment compensation or disability benefits law, or under any similar law; provided that the Federal Employers' Liability Act, U.S. Code (1946), Title 45, Sections 51-60, as amended, shall for the purposes of this insurance be deemed not to be any similar law;

(f) under Coverage B, to injury to or destruction of property (1) owned by the named insured or (2) leased or entrusted to the named insured under a lease or trust agreement.

(g) 1. Under any liability coverage, to injury, sickness, disease, death or destruction

(a) with respect to which an insured under the policy is also an insured under a nuclear energy liability policy issued by Nuclear Energy Liability Insurance Association, Mutual Atomic Energy Liability Underwriters or Nuclear Insurance Association of Canada, or would be an insured under any such policy but for its termination upon exhaustion of its limit of liability; or

(b) resulting from the hazardous properties of nuclear material and with respect to which (1) any person or organization is required to maintain financial protection

pursuant to the Atomic Energy Act of 1954, or any law amendatory thereof, or (2) the insured is, or had this policy not been issued would be, entitled to indemnity from the United States of America, or any agency thereof, under any agreement entered into by the United States of America, or any agency thereof, with any person or organization.

2. Under any medical payments coverage, or under any Supplementary Payments provision relating to immediate medical or surgical relief, to expenses incurred with respect to bodily injury, sickness, disease or death resulting from the hazardous properties of nuclear material and arising out of the operation of a nuclear facility by any person or organization.

3. Under any liability coverage, to injury, sickness, disease, death or destruction resulting from the hazardous properties of nuclear material, if

(a) the nuclear material (1) is at any nuclear facility owned by, or operated by or on behalf of, an insured or (2) has been discharged or dispersed therefrom;

(b) the nuclear material is contained in spent fuel or waste at any time possessed, handled, used, processed, stored, transported or dis-posed of by or on behalf of an insured; or

(c) the injury, sickness, disease, death or destruction arises out of the furnishing by an insured of services, materials, parts or equipment in connection with the planning, construction, maintenance, operation or use of any nuclear facility, but if such facility is located within the United States of America, its territories or possessions or Canada, this exclusion (c) applies only to injury to or destruction of property at such nuclear facility.

4. As used in this exclusion:

"hazardous properties" include radioactive, toxic or explosive properties;

"nuclear material" means source material, special nuclear material or byproduct material;

"source material", "special nuclear material", and "byproduct material" have the meanings given them in the Atomic Energy Act of 1954 or in any law amendatory thereof; "spent fuel" means any fuel element or fuel component, solid or liquid, which has been used or exposed to radiation in a nuclear reactor;

"waste" means any waste material (1) containing byproduct material and (2) resulting from the operation by any person or organization of any nuclear facility included within the definition of nuclear facility under paragraph (a) or (b) thereof;
"nuclear facility" means

(a) any nuclear reactor,

(b) any equipment or device designed or used for (1) separating the isotopes of uranium or plutonium, (2) processing or utilizing spent fuel, or (3) handling, processing or packaging waste,

(c) any equipment or device used for the processing, fabricating or alloying of special nuclear material if at any time the total amount of such material in the custody of the insured at the premises where such equipment or device is located consists of or contains more than 25 grams of plutonium or uranium 233 or any combination thereof, or more than 250 grams of uranium 235,

(d) any structure, basin, excavation, premises or place prepared or used for the storage or disposal of waste, and includes the site on which any of the foregoing is located, all operations conducted on such site and all premises used for such operations;

"nuclear reactor" means any apparatus designed or used to sustain nuclear fission in a self-supporting chain reaction or to contain a critical mass of fissionable material;

with respect to injury to or destruction of property, the word "injury" or "destruction" includes all forms of radioactive contamination of property.

(h) under Coverage C, to loss due to nuclear reaction, nuclear radiation or radioactive contamination, or to any act or condition incident to any of the foregoing.

CONDITIONS

(The conditions, except conditions 3, 4, 5, 7, 8, 9, 10, 11 and 12, apply to all coverages. Conditions 3, 4, 5, 7, 8, 9, 10, 11 and 12, apply only to the coverage noted thereunder.)

1. Premium.--The premium bases and rates for the hazards described in the declarations are stated therein. Premium bases and rates for hazards not so described are those applicable in accordance with the manuals in use by the company.

The term "contract cost" means the total cost of all work described in Item 6 of the declarations.

The term "rental cost" means the total cost to the Contractor for rental of work trains or other railroad equipment, including the remuneration of all employees of the insured while operating, attached to or engaged thereon.

The advance premium stated in the declarations is an estimated premium only. Upon termination of this policy the earned premium shall be computed in accordance with the company's rules, rates, rating plans, premiums and minimum premiums applicable to this insurance. If the earned premium thus computed exceeds the estimated advance premium paid, the company shall look to the Contractor specified in the declarations for any such excess; if less, the company shall return to the said Contractor the unearned portion paid.

In no event shall payment of premium be an obligation of the named insured.

2. Inspection.--The named insured shall make available to the company records of information relating to the subject matter of this insurance.

The company shall be permitted to inspect all operations in connection with the work described in Item 6 of the declarations.

3. Limits of Liability, Coverage A.--The limit of bodily injury liability stated in the declarations as applicable to "each person" is the limit of the company's liability for all damages, including damages for care and loss of services, arising out of bodily injury sustained by one person as the result of any one occurrence; the limit of such liability stated in the declarations as applicable to "each occurrence" is, subject to the above provision respecting each person, the total limit of the company's liability for all such damage arising out of bodily injury sustained by two or more persons as the result of any one occurrence.

4. Limits of Liability, Coverages B and C.--The limit of liability under Coverages B and C stated in the declarations as applicable to "each occurrence" is the total limit of the company's liability for all damages and all loss under Coverage B and C combined arising out of physical injury to, destruction or loss of all property of one or more persons or organizations, including the loss of use of any property due to such injury or destruction under Coverage B, as the result of any one occurrence.

Subject to the above provision respecting "each occurrence," the limit of liability under Coverages B and C stated in the declarations as "aggregate" is the total limit of the company's liability for all damages and all loss under Coverages B and C combined arising out of physical injury to, destruction or loss of property, including the loss of use of any property due to such injury or destruction under Coverage B.

Under Coverage C, the limit of the company's liability for loss shall not exceed the actual cash value of the property, or if the loss is of a part thereof the actual cash value of such part, at time of loss, nor what it would then cost to repair or replace the property or such part thereof with other of like kind and quality.

5. Severalty of Interests, Coverages A and B.-- The term "the insured" is used severally and not collectively, but the inclusion herein of more than one insured shall not operate to increase the limits of the company's liability.

6. Notice.--In the event of an occurrence or loss, written notice containing particulars sufficient to identify the insured and also reasonably obtainable information with respect to the time, place and circumstances thereof, and the names and addresses of the injured and of available witnesses, shall be given by or for the insured to the company or any of its authorized agents as soon as practicable. If claim is made or suit is brought against the insured, he shall immediately forward to the company every demand, notice, summons or other process received by him or his representative.

7. Assistance and Cooperation of the Insured, Coverages A and B.--The insured shall cooperate with the company and, upon the company's request, attend hearings and trials and assist in making settlements, securing and giving evidence, obtaining the attendance of witnesses and in the conduct of suits. The insured shall not, except at his own cost, voluntarily make any payment, assume any obligation or incur any expense other than for such immediate medical and surgical relief to others as shall be imperative at the time of accident.

8. Action Against Company, Coverages A and B.--No action shall lie against the company unless, as a condition precedent thereto, the insured shall have fully complied with all the terms of this policy, nor until the amount of the insured's obligation to pay shall have been finally determined either by judgment against the insured after actual trial or by written agreement of the insured, the claimant and the company.

Any person or organization or the legal representative thereof who has secured such judgment or written agreement shall thereafter be entitled to recover under this policy to the extent of the insurance afforded by this policy. No person or organization shall have any right under this policy to join the company as a party to any action against the insured to determine the insured's liability. Bankruptcy or insolvency of the insured or of the insured's estate shall not relieve the company of any of its obligations hereunder.

Coverage C.--No action shall lie against the company unless, as a condition precedent thereto, there shall have been full compliance with all the terms of this policy nor until 30 days after proof of loss is filed and the amount of loss is determined as provided in this policy.

9. Insured's Duties in Event of Loss, Coverage C.--In the event of loss the insured shall:

(a) protect the property, whether or not the loss is covered by this policy, and any further loss due to the insured's failure to protect shall not be recoverable under this policy; reasonable expenses incurred in affording such protection shall be deemed incurred at the company's request;

(b) file with the company, as soon as practicable after loss, his sworn proof of loss in such form and including such information as the company may reasonably require and shall, upon the company's request, exhibit the damaged property.

10. Appraisal, Coverage C.--If the insured and the company fail to agree as to the amount of loss, either may, within 60 days after the proof of loss is filed, demand an appraisal of the loss. In such event the insured and the company shall each select a competent appraiser, and the appraisers shall select a competent and disinterested umpire. The appraisers shall state separately the actual cash value and the amount of loss and failing to agree shall submit their differences to the umpire. An award in writing of any two shall determine the amount of loss. The insured and the company shall each

pay his chosen appraiser and shall bear equally the other expenses of the appraisal and umpire.

The company shall not be held to have waived any of its rights by any act relating to appraisal.

11. Payment of Loss, Coverage C.--The company may pay for the loss in money but there shall be no abandonment of the damaged property to the company.

12. No Benefit to Bailee, Coverage C.--The insurance afforded by this policy shall not inure directly or indirectly to the benefit of any carrier or bailee, other than the named insured, liable for loss to the property.

13. Subrogation.--In the event of any payment under this policy, the company shall be subrogated to all the insured's rights of recovery therefor against any person or organization and the insured shall execute and deliver instruments and papers and do whatever else is necessary to secure such rights. The insured shall do nothing after loss to prejudice such rights.

14. Application of Insurance.--The insurance afforded by this policy is primary insurance.

15. Three Year Policy.--A policy period of three years is comprised of three consecutive annual periods. Computation and adjustment of earned premium shall be made at the end of each annual period. Aggregate limits of liability as stated in this policy shall apply separately to each annual period.

16. Changes.--Notice to any agent or knowledge possessed by any agent or by any other person shall not effect a waiver or a change in any part of this policy or estop the company from asserting any right under the terms of this policy; nor shall the terms of this policy be waived or changed, except by endorsement issued to form a part of this policy.

17. Assignment.--Assignment of interest under this policy shall not bind the company until its consent is endorsed hereon.

18. Cancellation.--This policy may be canceled by the named insured by mailing to the company written notice stating when thereafter the cancellation shall be effective. This policy may be canceled by the company by mailing to the named insured, Contractor and governmental authority at the respective addresses shown in this policy written notice stating when not less than 30 days thereafter such cancellation shall be effective. The mailing of notice as aforesaid shall be sufficient proof of notice. The effective date and hour of cancellation stated in the notice shall become the end of the policy period. Delivery of such written notice either by the named insured or by the company shall be equivalent to mailing.

If the named insured cancels, earned premium shall be computed in accordance with the customary short rate table and procedure. If the company cancels, earned premium shall be computed pro rata. Premium adjustment may be made either at the time cancellation is effected or as soon as practicable after cancellation becomes effective, but payment or tender of unearned premium is not a condition of cancellation.

19. Declaration.--By acceptance of this policy the named insured agrees that such statements in the declarations as are made by him are his agreements and representations, that this policy is issued in reliance upon the truth of such representations and that this policy embodies all agreements existing between himself and the company or any of its agents relating to this insurance.

In witness whereof, the _____ Insurance Company has caused this policy to be signed by its president and a secretary at _____, and countersigned on the declarations page by a duly authorized agent of the company.

(Facsimile of Signature) (Facsimile of Signature)

_____ _____

Secretary President

CERTIFICATE OF INSURANCE

This is to certify to: RAILROAD FILE NO.:
MUNI AT WEST BAY SUPERSTRUCTURE

(1) Agreement Section, Structures, Engineering Services Center
California Department of Transportation
State of California
1801 30th Street, Sacramento, California 95816

(2) and to the following Railroad Company

that such insurance as is afforded by the policy or policies described below for bodily injury liability and property damage liability is in full force and effect as of the date of this certificate and covers the following contractor as a named insured with respect to liability for damages arising out of operations performed by or for the named insured in connection with the contract or work described below.

1. Named Insured and Address

This is to certify that policies of insurance listed below have been issued to the insured named above and are in force at this time. Notwithstanding any requirement, term or condition of any contract or other document with respect to which this certificate may be issued or may pertain, the insurance afforded by the policies described herein is subject to all the terms, exclusions and conditions of such policies.

2. Description of Work

Contract No. _____

3. Coverages	Policy Expiration Date	Limits of Liability Each Occurrence	Aggregate
Contractor's Bodily Injury Liability and Property Damage Liability			
Umbrella or Excess Liability			

All of the coverages include coverage for the completed operations hazard, and X, C and U exposures.

Name of Insurance Company by Coverage

Coverages	Company	Policy Number
Bodily Injury Liability		
Property Damage Liability		
Umbrella or Excess Liability		

4. The policy or policies described above will not be amended, altered, modified or cancelled until thirty (30) days after written notice thereof has been given by registered mail to the (1) Office Engineer, Division of Construction, Department of Transportation, and (2) the Railroad named as certificate holder in this certificate.

Certificate Date:

For _____
(Insurance Company)

By _____
(Authorized Agent or Representative)

State of California
Department of Transportation
DH-0S-A104(10-28-88)