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STATE OF CALIFORNIA

DEPARTMENT OF TRANSPORTATION

**NOTICE TO CONTRACTORS
AND**

SPECIAL PROVISIONS

FOR CONSTRUCTION ON STATE HIGHWAY IN

**ALAMEDA AND CONTRA COSTA COUNTIES IN AND NEAR OAKLAND AT CALDECOTT TUNNEL FROM
0.4 km WEST TO 0.5 km EAST OF ALAMEDA-CONTRA COSTA COUNTY LINE.**

DISTRICT 04, ROUTE 24

**For Use in Connection with Standard Specifications Dated JULY 1999, Standard Plans
Dated JULY 1999, and Labor Surcharge and Equipment Rental Rates.**

**CONTRACT NO. 04-163644
04-Ala,CC-24-R9.5/10.0,R0.0/0.5**

**Federal Aid Project
ACNH-P024(027)E**

**Bids Open: October 11, 2000
Dated: August 28, 2000**

OSD

IMPORTANT SPECIAL NOTICES

- The Special Provisions for Federal-aid projects (with and without DBE goals) have been revised to incorporate changes made by new regulations governing the DBE Program (49 CFR Part 26).

Sections 2 and 5 incorporate the changes. Bidders should read these sections to become familiar with them. Attention is directed to the following significant changes:

Section 2, "Disadvantaged Business Enterprise (DBE)" revises the counting of participation by DBE primes, and the counting of trucking performed by DBE firms. The section also revises the information that must be submitted to the Department in order to receive credit for trucking.

Section 2, "Submission of DBE Information" revises the information required to be submitted to the Department to receive credit toward the DBE goal. It also revises the criteria to demonstrate good faith efforts.

Section 5, "Subcontractor and DBE Records" revises the information required to be reported at the end of the project, and information related to trucking that must be submitted throughout the project.

Section 5, "DBE Certification Status" adds new reporting requirements related to DBE certification.

Section 5, "Subcontracting" describes the efforts that must be made in the event a DBE subcontractor is terminated or fails to complete its work for any reason.

Section 5, "Prompt Progress Payment to Subcontractors" requires prompt payment to all subcontractors.

Section 5, "Prompt Payment of Withheld Funds to Subcontractors" requires the prompt payment of retention to all subcontractors.

- **SURETY 2000**

Caltrans is conducting a pilot program in cooperation with Surety 2000, to test electronic bond verification systems. The purpose of the pilot program is to test the use of Surety 2000 for verifying a bidder's bond electronically.

Surety 2000 is an Internet-based surety verification and security system, developed in conjunction with the surety industry. Surety agents may contact Surety 2000 at 1-800-660-3263.

Bidders are encouraged to participate in the pilot program. To participate, the bidder is asked to provide the "Authorization Code" provided by Surety 2000, on a separate sheet, together with the standard bidder's bond required by the specifications. The bidder's surety agent may obtain the "Authorization Code" from Surety 2000.

The Department will use the "Authorization Code" to access the Surety 2000 database, and independently verify the actual bidder's bond and document the functioning of the Surety 2000 system.

"Authorization Codes" will be used only to verify bidder's bonds, and only as part of the pilot program. The use of "Authorization Codes" will not be accepted in lieu of the bidder's bond or other bidder's security required in the specifications during the pilot study.

The function of the Surety 2000 system is to provide an easier way for Contractors to protect their bid security, and to discourage fraud. This system is available to all California admitted sureties and surety agents.

The results of the pilot study will be tabulated, and at some time in the future, the Department may consider accepting electronic bidder's bond verification in lieu of the bidder's bond specified.

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STANDARD PLANS LIST

The Standard Plan sheets applicable to this contract include, but are not limited to those indicated below. The Revised Standard Plans (RSP) and New Standard Plans (NSP) which apply to this contract are included as individual sheets of the project plans.

A10A	Abbreviations
A10B	Symbols
T1A	Temporary Crash Cushion, Sand Filled (Unidirectional)
T2	Temporary Crash Cushion, Sand Filled (Shoulder Installations)
T3	Temporary Railing (Type K)
T7	Construction Project Funding Identification Signs
T10	Traffic Control System for Lane Closure On Freeways and Expressways
RS1	Roadside Signs, Typical Installation Details No. 1
RS2	Roadside Signs - Wood Post, Typical Installation Details No. 2
RS4	Roadside Signs, Typical Installation Details No. 4
ES-1A	Signal, Lighting and Electrical Systems - Symbols and Abbreviations
ES-1B	Signal, Lighting and Electrical Systems - Symbols and Abbreviations
ES-8	Signal, Lighting and Electrical Systems - Pull Box Details
ES-13A	Signal, Lighting and Electrical Systems - Splicing Details

DEPARTMENT OF TRANSPORTATION

NOTICE TO CONTRACTORS

CONTRACT NO. 04-163644

04-Ala,CC-24-R9.5/10.0,R0.0/0.5

Sealed proposals for the work shown on the plans entitled:

STATE OF CALIFORNIA; DEPARTMENT OF TRANSPORTATION; PROJECT PLANS FOR CONSTRUCTION ON STATE HIGHWAY IN ALAMEDA AND CONTRA COSTA COUNTIES IN AND NEAR OAKLAND AT CALDECOTT TUNNEL FROM 0.4 km WEST TO 0.5 km EAST OF ALAMEDA-CONTRA COSTA COUNTY LINE.

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 October 11, 2000, 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 ALAMEDA AND CONTRA COSTA COUNTIES IN AND NEAR OAKLAND AT CALDECOTT TUNNEL FROM 0.4 km WEST TO 0.5 km EAST OF ALAMEDA-CONTRA COSTA COUNTY LINE.

General work description: UPGRADE LIGHTING

This project has a goal of 8 percent disadvantaged business enterprise (DBE) participation.

No prebid meeting is scheduled for this project.

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

Bids are required for the entire work described herein.

At the time this contract is awarded, the Contractor shall possess either a Class A license or a Class C-10 license.

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

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, MS #26, Transportation Building, 1120 N Street, 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 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.

The Department of Transportation hereby notifies all bidders that it will affirmatively insure that in any contract entered into pursuant to this advertisement, disadvantaged business enterprises will be afforded full opportunity to submit bids in response to this invitation.

The U.S. Department of Transportation (DOT) provides a toll-free "hotline" service to report bid rigging activities. Bid rigging activities can be reported Mondays through Fridays, between 8:00 a.m. and 5:00 p.m., eastern time, Telephone No. 1-800-424-9071. Anyone with knowledge of possible bid rigging, bidder collusion, or other fraudulent activities should use the "hotline" to report these activities. The "hotline" is part of the DOT's continuing effort to identify and investigate highway construction contract fraud and abuse and is operated under the direction of the DOT Inspector General. All information will be treated confidentially and caller anonymity will be respected.

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>. The Federal minimum wage rates for this project as predetermined by the United States Secretary of Labor are set forth in the books issued for bidding purposes entitled "Proposal and Contract," and in copies of this book that may be examined at the offices described above where project plans, special provisions, and proposal forms may be seen. Addenda to modify the Federal minimum wage rates, if necessary, will be issued to holders of "Proposal and Contract" books. Future effective general prevailing wage rates which have been predetermined and are on file with the California Department of Industrial Relations are referenced but not printed in the general prevailing wage rates.

Attention is directed to the Federal minimum wage rate requirements in the books entitled "Proposal and Contract." If there is a difference between the minimum wage rates predetermined by the Secretary of Labor and the general prevailing wage rates determined by the Director of the California Department of Industrial Relations for similar classifications of labor, the Contractor and subcontractors shall pay not less than the higher wage rate. The Department will not accept lower State wage rates not specifically included in the Federal minimum wage determinations. This includes "helper" (or other classifications based on hours of experience) or any other classification not appearing in the Federal wage determinations. Where Federal wage determinations do not contain the State wage rate determination otherwise available for use by the Contractor and subcontractors, the Contractor and subcontractors shall pay not less than the Federal minimum wage rate which most closely approximates the duties of the employees in question.

DEPARTMENT OF TRANSPORTATION

Deputy Director Transportation Engineering

Dated August 28, 2000

MN

**COPY OF ENGINEER'S ESTIMATE
(NOT TO BE USED FOR BIDDING PURPOSES)**

04-163644

Item	Item Code	Item	Unit of Measure	Estimated Quantity
1	019679	LEAD SAMPLING AND ANALYSIS	LS	LUMP SUM
2	074018	HEALTH AND SAFETY PLAN	LS	LUMP SUM
3	120090	CONSTRUCTION AREA SIGNS	LS	LUMP SUM
4	157560	BRIDGE REMOVAL (PORTION)	LS	LUMP SUM
5	048362	REDWOOD NAILERS	M3	6
6	048363	ALUMINUM LOUVER AND BORDER PLATE UNITS	M2	815
7	019680	SCADA MODIFICATIONS	LS	LUMP SUM
8	019681	EAST PORTAL PHOTO SENSOR CONDUIT RUN	LS	LUMP SUM
9	019682	WEST PORTAL PHOTO SENSOR CONDUIT RUN	LS	LUMP SUM
10	019683	BORE 1 LUMINAIRE LAYOUT	LS	LUMP SUM
11	019684	BORE 2 LUMINAIRE LAYOUT	LS	LUMP SUM
12	019685	BORE 3 LUMINAIRE LAYOUT	LS	LUMP SUM
13	019686	BORE 1 AND 2 SCREEN LUMINAIRE LAYOUT	LS	LUMP SUM
14	019687	MODIFY PYLON AND APPROACH LIGHTING	LS	LUMP SUM
15	019688	BORE 1 AND 2 EXISTING EQUIPMENT REMOVAL	LS	LUMP SUM
16	019689	BORE 3 EXISTING EQUIPMENT REMOVAL	LS	LUMP SUM
17	019690	SPARES	LS	LUMP SUM
18	109691	WEST PORTAL CONDUIT LAYOUT PLAN	LS	LUMP SUM
19	019692	WEST PORTAL BORE 3 SUBSTATION LAYOUT	LS	LUMP SUM
20	019693	WEST PORTAL BORE 3 FAN ROOM AND CONTROL ROOM	LS	LUMP SUM

Item	Item Code	Item	Unit of Measure	Estimated Quantity
21	019694	WEST PORTAL BORE 1 AND 2 ELECTRICAL PLAN	LS	LUMP SUM
22	019695	EAST PORTAL BORE 2 SUBSTATION LAYOUT	LS	LUMP SUM
23	019696	EAST PORTAL EXHAUST DUCT PLAN	LS	LUMP SUM
24	019697	EAST PORTAL BORE 3 ELECTRICAL PARTIAL PLAN	LS	LUMP SUM

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISIONS

Annexed to Contract No. 04-163644

SECTION 1. SPECIFICATIONS AND PLANS

The work embraced herein shall conform to the provisions in the Standard Specifications dated July 1999, and the Standard Plans dated July 1999, 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 or table following the 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 shall 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 conformance with Section 2-1.054, "Required Listing of Proposed Subcontractors," of the Standard Specifications, each proposal shall have listed therein the portion of work that will be performed by each subcontractor listed.

The Bidder's Bond form 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.

Submit request for substitution of an "or equal" item, and the data substantiating the request to the Department of Transportation, Division Of Construction - Duty Senior, Mail Station: 3 - B, 111 Grand Avenue / P. O. Box 23660, Oakland, Ca 94623-0660, so that the request is received by the Department by close of business on the fourth day, not including Saturdays, Sundays and legal holidays, following bid opening.

In conformance 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.

The contractor, sub recipient or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR part 26 in the award and administration of DOT-assisted contracts. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the recipient deems appropriate. Each subcontract signed by the bidder must include this assurance.

2-1.015 FEDERAL LOBBYING RESTRICTIONS

Section 1352, Title 31, United States Code prohibits Federal funds from being expended by the recipient or any lower tier subrecipient of a Federal-aid contract to pay for any person for influencing or attempting to influence a Federal agency or Congress in connection with the awarding of any Federal-aid contract, the making of any Federal grant or loan, or the entering into of any cooperative agreement.

If any funds other than Federal funds have been paid for the same purposes in connection with this Federal-aid contract, the recipient shall submit an executed certification and, if required, submit a completed disclosure form as part of the bid documents.

A certification for Federal-aid contracts regarding payment of funds to lobby Congress or a Federal agency is included in the Proposal. Standard Form - LLL, "Disclosure of Lobbying Activities," with instructions for completion of the Standard Form is also included in the Proposal. Signing the Proposal shall constitute signature of the Certification.

The above-referenced certification and disclosure of lobbying activities shall be included in each subcontract and any lower-tier contracts exceeding \$100,000. All disclosure forms, but not certifications, shall be forwarded from tier to tier until received by the Engineer.

The Contractor, subcontractors and any lower-tier contractors shall file a disclosure form at the end of each calendar quarter in which there occurs any event that requires disclosure or that materially affects the accuracy of the information contained in any disclosure form previously filed by the Contractor, subcontractors and any lower-tier contractors. An event that materially affects the accuracy of the information reported includes:

- A. A cumulative increase of \$25,000 or more in the amount paid or expected to be paid for influencing or attempting to influence a covered Federal action; or
- B. A change in the person(s) or individual(s) influencing or attempting to influence a covered Federal action; or,
- C. A change in the officer(s), employee(s), or Member(s) contacted to influence or attempt to influence a covered Federal action.

2-1.02 DISADVANTAGED BUSINESS ENTERPRISE (DBE)

This project is subject to Part 26, Title 49, Code of Federal Regulations entitled "Participation by Disadvantaged Business Enterprises in Department of Transportation Financial Assistance Programs." The Regulations in their entirety are incorporated herein by this reference.

Bidders shall be fully informed respecting the requirements of the Regulations and the Department's Disadvantaged Business Enterprise (DBE) program developed pursuant to the Regulations; particular attention is directed to the following matters:

- A. A DBE must be a small business concern as defined pursuant to Section 3 of U.S. Small Business Act and relevant regulations promulgated pursuant thereto.
- B. A DBE may participate as a prime contractor, subcontractor, joint venture partner with a prime or subcontractor, vendor of material or supplies, or as a trucking company.
- C. A DBE bidder, not bidding as a joint venture with a non-DBE, will be required to document one or a combination of the following:
 - 1. The bidder will meet the goal by performing work with its own forces.
 - 2. The bidder will meet the goal through work performed by DBE subcontractors, suppliers or trucking companies.
 - 3. The bidder, prior to bidding, made adequate good faith efforts to meet the goal.
- D. A DBE 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 DBE joint venture partner must share in the capital contribution, control, management, risks and profits of the joint venture. The DBE joint venturer must submit the joint venture agreement with the proposal or the DBE Information form required in the Section entitled "Submission of DBE Information" of these special provisions.
- E. A DBE 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. DBEs must be certified by either the California Department of Transportation, or by a participating State of California or local agency which certifies in conformance with Title 49, Code of Federal Regulations, Part 26, as of the date of bid opening. It is the Contractor's responsibility to verify that DBEs are certified. Listings of DBEs certified by the Department are available from the following sources:
 - 1. The Department's DBE Directory, which is published quarterly. This Directory may be obtained from the Department of Transportation, Materiel Operations Branch, Publication Distribution Unit, 1900 Royal Oaks Drive, Sacramento, California 95815, Telephone: (916) 445-3520.

2. The Department's Electronic Information Bulletin Board Service, which is accessible by modem and is updated weekly. The Bulletin Board may be accessed by first contacting the Department's Business Enterprise Program at Telephone: (916) 227-8937 and obtaining a user identification and password.
3. The Department's web site at <http://www.dot.ca.gov/hq/bep/index.htm>.
4. The organizations listed in the Section entitled "DBE Goal for this Project" of these special provisions.

G. Credit for materials or supplies purchased from DBEs will be as follows:

1. If the materials or supplies are obtained from a DBE manufacturer, 100 percent of the cost of the materials or supplies will count toward the DBE goal. A DBE manufacturer is a firm that operates or maintains a factory or establishment that produces, on the premises, the materials, supplies, articles, or equipment required under the contract and of the general character described by the specifications.
2. If the materials or supplies are purchased from a DBE regular dealer, 60 percent of the cost of the materials or supplies will count toward the DBE goal. A DBE regular dealer is a firm that owns, operates, or maintains a store, warehouse, or other establishment in which the materials, supplies, articles or equipment of the general character described by the specifications and required under the contract are bought, kept in stock, and regularly sold or leased to the public in the usual course of business. To be a DBE regular dealer, the firm must be an established, regular business that engages, as its principal business and under its own name, in the purchase and sale or lease of the products in question. A person may be a DBE regular dealer in such bulk items as petroleum products, steel, cement, gravel, stone, or asphalt without owning, operating, or maintaining a place of business as provided in this paragraph G.2. if the person both owns and operates distribution equipment for the products. Any supplementing of regular dealers' own distribution equipment shall be by a long-term lease agreement and not on an ad hoc or contract-by-contract basis. Packagers, brokers, manufacturers' representatives, or other persons who arrange or expedite transactions are not DBE regular dealers within the meaning of this paragraph G.2.
3. Credit for materials or supplies purchased from a DBE which is neither a manufacturer nor a regular dealer will be limited to the entire amount of fees or commissions charged for assistance in the procurement of the materials and supplies, or fees or transportation charges for the delivery of materials or supplies required on a job site, provided the fees are reasonable and not excessive as compared with fees charged for similar services.

H. Credit for DBE trucking companies will be as follows:

1. The DBE must be responsible for the management and supervision of the entire trucking operation for which it is responsible on a particular contract, and there cannot be a contrived arrangement for the purpose of meeting the DBE goal.
2. The DBE must itself own and operate at least one fully licensed, insured, and operational truck used on the contract.
3. The DBE receives credit for the total value of the transportation services it provides on the contract using trucks its owns, insures, and operates using drivers it employs.
4. The DBE may lease trucks from another DBE firm, including an owner-operator who is certified as a DBE. The DBE who leases trucks from another DBE receives credit for the total value of the transportation services the lessee DBE provides on the contract.
5. The DBE may also lease trucks from a non-DBE firm, including an owner-operator. The DBE who leases trucks from a non-DBE is entitled to credit only for the fee or commission it receives as a result of the lease arrangement. The DBE does not receive credit for the total value of the transportation services provided by the lessee, since these services are not provided by a DBE.
6. For the purposes of this paragraph H, a lease must indicate that the DBE has exclusive use of and control over the truck. This does not preclude the leased truck from working for others during the term of the lease with the consent of the DBE, so long as the lease gives the DBE absolute priority for use of the leased truck. Leased trucks must display the name and identification number of the DBE.

- I. Noncompliance by the Contractor with the requirements of the regulations constitutes a breach of this contract and may result in termination of the contract or other appropriate remedy for a breach of this contract.
- J. Bidders are encouraged to use services offered by financial institutions owned and controlled by DBEs.

2-1.02A DBE GOAL FOR THIS PROJECT

The Department has established the following goal for Disadvantaged Business Enterprise (DBE) participation for this project:

Disadvantaged Business Enterprise (DBE): 8 percent

Bidders may use the services of the following firms to contact interested DBEs. These firms are available to assist DBEs in preparing bids for subcontracting or supplying materials.

The following firms may be contacted for projects in the following locations:

<p>Districts 04, 05 (except San Luis Obispo and Santa Barbara Counties), 06 (except Kern County) and 10:</p> <hr/> <p>Triaxial Management Services, Inc. - Oakland</p> <p>1545 Willow Street, 1st Floor Oakland, CA 94607 Telephone - (510) 286-1313 FAX No. - (510) 286-6792</p>	<p>Districts 08, 11 and 12:</p> <hr/> <p>Triaxial Management Services, Inc. - San Diego 2725 Congress Street, Suite 1-D San Diego, CA 92110 Telephone - (619) 543-5109 FAX No. - (619) 543-5108</p>
<p>Districts 07 and 08; in San Luis Obispo and Santa Barbara Counties in District 05; and in Kern County in District 06:</p> <hr/> <p>Triaxial Management Services, Inc. - Los Angeles 2594 Industry Way, Suite 101 Lynwood, CA 90262 Telephone - (310) 537-6677 FAX No. - (310) 637-0128</p>	<p>Districts 01, 02, 03 and 09:</p> <hr/> <p>Triaxial Management Services, Inc. - Sacramento 930 Alhambra Blvd., #205 Sacramento, CA 95816 Telephone - (916) 553-4172 FAX No. - (916) 553-4173</p>

2-1.02B SUBMISSION OF DBE INFORMATION

The required DBE information shall be submitted on the "CALTRANS BIDDER - DBE INFORMATION" form included in the Proposal. If the DBE information is not submitted with the bid, the DBE Information form shall be removed from the documents prior to submitting the bid.

It is the bidder's responsibility to make enough work available to DBEs and to select those portions of the work or material needs consistent with the available DBEs to meet the goal for DBE participation or to provide information to establish that, prior to bidding, the bidder made adequate good faith efforts to do so.

If DBE information is not submitted with the bid, the apparent successful bidder (low bidder), the second low bidder and the third low bidder shall submit DBE information to the Department of Transportation, 1120 N Street, Room 0200, MS #26, Sacramento, California 95814 so the information is received by the Department no later than 4:00 p.m. on the fourth day, not including Saturdays, Sundays and legal holidays, following bid opening. DBE information sent by U.S. Postal Service certified mail with return receipt and certificate of mailing and mailed on or before the third day, not including Saturdays, Sundays and legal holidays, following bid opening will be accepted even if it is received after the fourth day following bid opening. Failure to submit the required DBE information by the time specified will be grounds for finding the bid or proposal nonresponsive. Other bidders need not submit DBE information unless requested to do so by the Department.

The bidder's DBE information shall establish that good faith efforts to meet the DBE goal have been made. To establish good faith efforts, the bidder shall demonstrate that the goal will be met or that, prior to bidding, adequate good faith efforts to meet the goal were made.

Bidders are cautioned that even though their submittal indicates they will meet the stated DBE goal, their submittal should also include their adequate good faith efforts information along with their DBE goal 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.

The bidder's DBE information shall include the names, addresses and phone numbers of DBE firms that will participate, with a complete description of work or supplies to be provided by each, the dollar value of each DBE transaction, and a

written confirmation from the DBE that it is participating in the contract. A copy of the DBE's quote will serve as written confirmation that the DBE is participating in the contract. When 100 percent of a contract item of work is not to be performed or furnished by a DBE, a description of the exact portion of that work to be performed or furnished by that DBE shall be included in the DBE information, including the planned location of that work. The work that a DBE prime contractor has committed to performing with its own forces as well as the work that it has committed to be performed by DBE subcontractors, suppliers and trucking companies will count toward the goal.

The information necessary to establish the bidder's adequate good faith efforts to meet the DBE goal should include:

- A. The names and dates of each publication in which a request for DBE participation for this project was placed by the bidder.
- B. The names and dates of written notices sent to certified DBEs soliciting bids for this project and the dates and methods used for following up initial solicitations to determine with certainty whether the DBEs were interested.
- C. The items of work which the bidder made available to DBE firms, including, where appropriate, any breaking down of the contract work items (including those items normally performed by the bidder with its own forces) into economically feasible units to facilitate DBE participation. It is the bidder's responsibility to demonstrate that sufficient work to meet the DBE goal was made available to DBE firms.
- D. The names, addresses and phone numbers of rejected DBE firms, the firms selected for that work, and the reasons for the bidder's choice.
- E. Efforts made to assist interested DBEs in obtaining bonding, lines of credit or insurance, and any technical assistance or information related to the plans, specifications and requirements for the work which was provided to DBEs.
- F. Efforts made to assist interested DBEs in obtaining necessary equipment, supplies, materials, or related assistance or services, excluding supplies and equipment the DBE subcontractor purchases or leases from the prime contractor or its affiliate.
- G. The names of agencies contacted to provide assistance in contacting, recruiting and using DBE firms.
- H. Any additional data to support a demonstration of good faith efforts.

SECTION 3. AWARD AND EXECUTION OF CONTRACT

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 award and execution of contract.

The award of the 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 DBE participation or has demonstrated, to the satisfaction of the Department, adequate good faith efforts to do so. Meeting the goal for DBE participation or demonstrating, to the satisfaction of the Department, adequate good faith efforts to do so is a condition for being eligible for award of contract.

A "Payee 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, payee 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 "Payee Data Record" form to the Department as provided herein will result in the retention of 31 percent of payments due the contractor and penalties of up to \$20,000. This retention of payments for failure to complete the "Payee Data Record" form is in addition to any other retention of payments due the Contractor.

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 15 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 **290 WORKING DAYS** beginning on the fifteenth calendar day after approval of the contract.

The Contractor shall pay to the State of California the sum of \$750 per day, for each and every calendar day's delay in finishing the work in excess of the number of working days prescribed above.

SECTION 5. GENERAL
SECTION 5-1. MISCELLANEOUS

5-1.01 PLANS AND WORKING DRAWINGS

When the specifications require working drawings to be submitted to the Division of Structure Design, the drawings shall be submitted to: Division of Structure Design, Documents Unit, Mail Station 9, 1801 30th Street, Sacramento, CA 95816, Telephone 916 227-8252.

5-1.015 LABORATORY

When a reference is made in the specifications to the "Laboratory," the reference shall mean the Division of Materials Engineering and Testing Services and the Division of Structural Foundations of the Department of Transportation, or established laboratories of the various Districts of the Department, or other laboratories authorized by the Department to test materials and work involved in the contract. When a reference is made in the specifications to the "Transportation Laboratory," the reference shall mean the Division of Materials Engineering and Testing Services and the Division of Structural Foundations, located at 5900 Folsom Boulevard, Sacramento, CA 95819, Telephone (916) 227-7000.

5-1.02 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 \$5000 or more.

5-1.03 INTEREST ON PAYMENTS

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

- A. Unpaid progress payments, payment after acceptance, and final payments shall begin to accrue interest 30 days after the Engineer prepares the payment estimate.
- B. Unpaid extra work bills shall begin to accrue interest 30 days after preparation of the first pay estimate following 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 conformance with the provisions in 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.
- C. The rate of interest payable for unpaid progress payments, payments after acceptance, final payments, and extra work payments shall be 10 percent per annum.
- D. 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.

5-1.04 PUBLIC SAFETY

The Contractor shall provide for the safety of traffic and the public in conformance 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 a lane open to public traffic and an excavation, obstacle or storage area when the following conditions exist:

- A. Excavations.—The near edge of the excavation is 3.6 m or less from the edge of the lane, except:

1. Excavations covered with sheet steel or concrete covers of adequate thickness to prevent accidental entry by traffic or the public.
 2. Excavations less than 0.3-m deep.
 3. Trenches less than 0.3-m wide for irrigation pipe or electrical conduit, or excavations less than 0.3-m in diameter.
 4. Excavations parallel to the lane for the purpose of pavement widening or reconstruction.
 5. Excavations in side slopes, where the slope is steeper than 1:4 (vertical:horizontal).
 6. Excavations protected by existing barrier or railing.
- B. Temporarily Unprotected Permanent Obstacles.—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 the Contractor, for the Contractor's 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.
- C. Storage Areas.—Material or equipment is stored within 3.6 m of the lane and the storage is not otherwise prohibited by the provisions of the Standard Specifications and these special provisions.

The approach end of temporary railing (Type K), installed in conformance with the provisions in this section "Public Safety" and in Section 7-1.09, "Public Safety," of the Standard Specifications, shall be offset a minimum of 4.6 m 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 0.3-m transversely to 3 m longitudinally with respect to the edge of the traffic lane. If the 4.6-m 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 1999 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.

Temporary crash cushion modules shall conform to the provisions in "Temporary Crash Cushion Module" of 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 Standard Specifications and these special provisions:

Approach Speed of Public Traffic (Posted Limit) (Kilometers Per Hour)	Work Areas
Over 72 (45 Miles Per Hour)	Within 1.8 m of a traffic lane but not on a traffic lane
56 to 72 (35 to 45 Miles Per Hour)	Within 0.9-m 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 a traffic lane, the line of cones or delineators shall be considered to be the edge of the traffic lane, however, the Contractor shall not reduce the width of an existing lane to less than 3 m 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 provisions 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.

5-1.05 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 materials furnished for the project, except for acquisition of materials in conformance with the provisions in Section 4-1.05, "Use of Materials Found on the Work," of the Standard Specifications.

5-1.06 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. The Contractor shall immediately cease work in the affected area and report the condition to the Engineer in writing.

In conformance with Section 25914.1 of the Health and Safety Code, removal of asbestos or hazardous substances including exploratory work to identify and determine the extent of the 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 the delay in conformance with the provisions in Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

5-1.07 YEAR 2000 COMPLIANCE

This contract is subject to Year 2000 Compliance for automated devices in the State of California.

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 shall operate accurately in the manner in which the product was intended for date operation without requiring manual intervention.

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

5-1.075 BUY AMERICA REQUIREMENTS

Attention is directed to the "Buy America" requirements of the Surface Transportation Assistance Act of 1982 (Section 165) and the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) Sections 1041(a) and 1048(a), and the regulations adopted pursuant thereto. In conformance with the law and regulations, all manufacturing processes for steel and iron materials 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 other coatings that protect or enhance the value of steel or iron materials shall be considered a manufacturing process subject to the "Buy America" 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 and iron materials. The certificates, in addition to certifying that the materials comply with the specifications, shall specifically certify that all manufacturing processes for the materials occurred in the United States, except for the above exceptions.

The requirements imposed by the law and regulations do not prevent a minimal use of foreign steel and iron materials if the total combined cost of the materials used does not exceed one-tenth of one percent (0.1 percent) of the total contract cost or \$2500, whichever is greater. The Contractor shall furnish the Engineer acceptable documentation of the quantity and value of the foreign steel and iron prior to incorporating the materials into the work.

5-1.08 SUBCONTRACTOR AND DBE RECORDS

The Contractor shall maintain records showing the name and business address of each first-tier subcontractor. The records shall also show the name and business address of every DBE subcontractor, DBE vendor of materials and DBE trucking company, regardless of tier. The records shall show the date of payment and the total dollar figure paid to all of these firms. DBE prime contractors shall also show the date of work performed by their own forces along with the corresponding dollar value of the work.

Upon completion of the contract, a summary of these records shall be prepared on Form CEM-2402 (F) and certified correct by the Contractor or the Contractor's authorized representative, and shall be furnished to the Engineer. The form shall be furnished to the Engineer within 90 days from the date of contract acceptance. \$10,000 will be withheld from payment until the Form CEM-2402 (F) is submitted. The amount will be returned to the Contractor when a satisfactory Form CEM-2402 (F) is submitted.

Prior to the fifteenth of each month, the Contractor shall submit documentation to the Engineer showing the amount paid to DBE trucking companies listed in the Contractor's DBE information. This monthly documentation shall indicate the portion of the revenue paid to DBE trucking companies which is claimed toward DBE participation. The Contractor shall

also obtain and submit documentation to the Engineer showing the amount paid by DBE trucking companies to all firms, including owner-operators, for the leasing of trucks. The DBE who leases trucks from a non-DBE is entitled to credit only for the fee or commission it receives as a result of the lease arrangement. The records must confirm that the amount of credit claimed toward DBE participation conforms with Section 2-1.02, "Disadvantaged Business Enterprise," of these special provisions.

The Contractor shall also obtain and submit documentation to the Engineer showing the truck number, owner's name, California Highway Patrol CA number, and if applicable, the DBE certification number of the owner of the truck for all trucks used during that month for which DBE participation will be claimed. This documentation shall be submitted on Form CEM-2404 (F).

5-1.083 DBE CERTIFICATION STATUS

If a DBE subcontractor is decertified during the life of the project, the decertified subcontractor shall notify the Contractor in writing with the date of decertification. If a subcontractor becomes a certified DBE during the life of the project, the subcontractor shall notify the Contractor in writing with the date of certification. The Contractor shall furnish the written documentation to the Engineer.

Upon completion of the contract, Form CEM-2403 (F) indicating the DBE's existing certification status shall be signed and certified correct by the Contractor. The certified form shall be furnished to the Engineer within 90 days from the date of contract acceptance.

5-1.086 PERFORMANCE OF DBE SUBCONTRACTORS AND SUPPLIERS

The DBEs listed by the Contractor in response to the provisions in Section 2-1.02B, "Submission of DBE Information," and Section 3, "Award and Execution of Contract," of these special provisions, which are determined by the Department to be certified DBEs, 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 use other forces or sources of materials may be requested for the following reasons:

- A. The listed DBE, after having had a reasonable opportunity to do so, fails or refuses to execute a written contract, when such written contract, based upon the general terms, conditions, plans and specifications for the project, or on the terms of such subcontractor's or supplier's written bid, is presented by the Contractor.
- B. The listed DBE becomes bankrupt or insolvent.
- C. The listed DBE fails or refuses to perform the subcontract or furnish the listed materials.
- D. The Contractor stipulated that a bond was a condition of executing a subcontract and the listed DBE subcontractor fails or refuses to meet the bond requirements of the Contractor.
- E. The work performed by the listed subcontractor is substantially unsatisfactory and is not in substantial conformance with the plans and specifications, or the subcontractor is substantially delaying or disrupting the progress of the work.
- F. It would be in the best interest of the State.

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

5-1.09 SUBCONTRACTING

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

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/DLSE/Debar.html>.

The provisions in the third paragraph of Section 8-1.01, "Subcontracting," of the Standard Specifications, that the Contractor shall perform with the Contractor's own organization contract work amounting to not less than 50 percent of the original contract price, is not changed by the Federal Aid requirement specified under "Required Contract Provisions Federal-Aid Construction Contracts" in Section 14 of these special provisions that the Contractor perform not less than 30 percent of the original contract work with the Contractor's own organization.

Each subcontract and any lower tier subcontract that may in turn be made shall include the "Required Contract Provisions Federal-Aid Construction Contracts" in Section 14 of these special provisions. This requirement shall be enforced as follows:

- A. Noncompliance shall be corrected. Payment for subcontracted work involved will be withheld from progress payments due, or to become due, until correction is made. Failure to comply may result in termination of the contract.

In conformance with the Federal DBE regulations Sections 26.53(f)(1) and 26.53(f)(2) Part 26, Title 49 CFR:

- A. The Contractor shall not terminate for convenience a DBE subcontractor listed in response to Section 2-1.02B, "Submission of DBE Information," and then perform that work with its own forces, or those of an affiliate without the written consent of the Department, and
- B. If a DBE subcontractor is terminated or fails to complete its work for any reason, the Contractor will be required to make good faith efforts to substitute another DBE subcontractor for the original DBE subcontractor, to the extent needed to meet the contract goal.

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

5-1.10 PROMPT PROGRESS PAYMENT TO SUBCONTRACTORS

Attention is directed to the provisions in Sections 10262 and 10262.5 of the Public Contract Code and Section 7108.5 of the Business and Professions Code concerning prompt payment to subcontractors.

5-1.102 PROMPT PAYMENT OF WITHHELD FUNDS TO SUBCONTRACTORS

The Contractor shall return all moneys withheld in retention from the subcontractor within 30 days after receiving payment for work satisfactorily completed, even if the other contract work is not completed and has not been accepted in conformance with Section 7-1.17, "Acceptance of Contract," of the Standard Specifications. This requirement shall not be construed to limit or impair any contractual, administrative, or judicial remedies otherwise available to the Contractor or subcontractor in the event of a dispute involving late payment or nonpayment by the Contractor or deficient subcontract performance or noncompliance by a subcontractor.

5-1.11 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.

5-1.12 PAYMENTS

Attention is directed to Sections 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 the payment as materials furnished but not incorporated in the work:

- A. Luminaires
- B. Linear Lights
- C. Aluminum Louver Units

5-1.13 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.

The noise level from the Contractor's operations, between the hours of 9:00 p.m. and 6:00 a.m., shall not exceed 86 dbA at a distance of 15 m. This requirement shall not relieve the Contractor from responsibility for complying with local ordinances regulating noise level.

The noise level requirement shall apply to the 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.

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.

5-1.14 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 other contract requirements. Use of the Contractor's work areas and other State-owned property shall be at the Contractor's own risk. The State shall not be held liable for damage to or loss of materials or equipment located within these areas.

The Contractor shall remove the equipment, materials, and rubbish from the work areas and other State-owned property which the Contractor 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 the Contractor's own expense, areas required for storage of plant, equipment, and materials, or for other purposes if sufficient area is not available to the Contractor within the contract limits.

5-1.15 UTILITIES

The Contractor may use electrical power, water, and compressed air from existing State outlets within the contract limits, where the utilities exist, free of charge for contract operations provided that the Contractor does not misuse these services, the utility services are in service, and the services are not required by the State for other purposes. Utilities shall be subject to the provisions in "Cooperation" of these special provisions.

The Contractor shall make arrangements to obtain additional electrical power, water or compressed air or other utilities required for the Contractor's operations and shall make and maintain the necessary service connections at the Contractor's own expense.

5-1.16 SANITARY PROVISIONS

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

5-1.17 ACCESS TO PROJECT SITE

Prospective bidders may make arrangements to visit the project site by contacting Superintendent of the Caldecott Tunnel, at telephone No.1-(510) 286-0315.

SECTION 6. (BLANK)

SECTION 7. (BLANK)

SECTION 8. MATERIALS

SECTION 8-1. MISCELLANEOUS

8-1.01 SUBSTITUTION OF NON-METRIC MATERIALS AND PRODUCTS

Only materials and products conforming to the requirements of the specifications shall be incorporated in the work. When metric materials and products are not available, and when approved by the Engineer, and at no cost to the State, materials and products in the inch-pound (Imperial) system which are of equal quality and of the required properties and characteristics for the purpose intended, may be substituted for the equivalent metric materials and products, subject to the following provisions:

- A. Materials and products shown on the plans or in the special provisions as being equivalent may be substituted for the metric materials and products specified or detailed on the plans.
- B. Before other non-metric materials and products will be considered for use the Contractor shall furnish, at the Contractor's expense, evidence satisfactory to the Engineer that the materials and products proposed for use are

equal to or better than the materials and products specified or detailed on the plans. The burden of proof as to the quality and suitability of substitutions shall be upon the Contractor and the Contractor shall furnish necessary information as required by the Engineer. The Engineer will be the sole judge as to the quality and suitability of the substituted materials and products and the Engineer's decision will be final.

- C. When the Contractor elects to substitute non-metric materials and products, including materials and products shown on the plans or in the special provisions as being equivalent, the list of sources of material as specified in Section 6-1.01, "Source of Supply and Quality of Materials," of the Standard Specification shall include a list of substitutions to be made and contract items involved. In addition, for a change in design or details the Contractor shall submit plans and working drawings in conformance with the provisions in Section 5-1.02, "Plans and Working Drawings," of the Standard Specifications.

Unless otherwise specified, the following substitutions of materials and products will be allowed:

SUBSTITUTION TABLE FOR SIZES OF HIGH STRENGTH STEEL FASTENERS

ASTM Designation: A 325M

METRIC SIZE SHOWN ON THE PLANS mm x thread pitch	IMPERIAL SIZE TO BE SUBSTITUTED inch
M16 x 2	5/8
M20 x 2.5	3/4
M22 x 2.5	7/8
M24 x 3	1
M27 x 3	1-1/8
M30 x 3.5	1-1/4
M36 x 4	1-1/2

SUBSTITUTION TABLE FOR PLAIN WIRE REINFORCEMENT, ASTM Designation: A 82

METRIC SIZE SHOWN ON THE PLANS mm ²	US CUSTOMARY UNITS SIZE TO BE SUBSTITUTED inch ² x 100
MW9	W1.4
MW10	W1.6
MW13	W2.0
MW15	W2.3
MW19	W2.9
MW20	W3.1
MW22	W3.5
MW25	W3.9, except W3.5 in piles only
MW26	W4.0
MW30	W4.7
MW32	W5.0
MW35	W5.4
MW40	W6.2
MW45	W6.5
MW50	W7.8
MW55	W8.5, except W8.0 in piles only
MW60	W9.3
MW70	W10.9, except W11.0 in piles only
MW80	W12.4
MW90	W14.0
MW100	W15.5

SUBSTITUTION TABLE FOR BAR REINFORCEMENT

METRIC BAR DESIGNATION NUMBER SHOWN ON THE PLANS	EQUIVALENT IMPERIAL BAR DESIGNATION NUMBER TO BE SUBSTITUTED
13	4
16	5
19	6
22	7
25	8
29	9
32	10
36	11
43	14
57	18

No adjustment will be required in spacing or total number of reinforcing bars due to a difference in minimum yield strength between metric and non-metric bars.

The sizes in the following tables of materials and products are exact conversions of metric sizes of materials and products and are listed as acceptable equivalents:

CONVERSION TABLE FOR SIZES OF:

- (1) STEEL FASTENERS FOR GENERAL APPLICATIONS, ASTM Designation: A 307 or AASHTO Designation: M 314, Grade 36 or 55, and
- (2) HIGH STRENGTH STEEL FASTENERS, ASTM Designation: A 325 or A 449

METRIC SIZE SHOWN ON THE PLANS mm	EQUIVALENT IMPERIAL SIZE inch
6, or 6.35	1/4
8 or 7.94	5/16
10, or 9.52	3/8
11, or 11.11	7/16
13 or 12.70	1/2
14, or 14.29	9/16
16, or 15.88	5/8
19, or 19.05	3/4
22, or 22.22	7/8
24, 25, or 25.40	1
29, or 28.58	1-1/8
32, or 31.75	1-1/4
35, or 34.93	1-3/8
38 or 38.10	1-1/2
44, or 44.45	1-3/4
51, or 50.80	2
57, or 57.15	2-1/4
64, or 63.50	2-1/2
70 or 69.85	2-3/4
76, or 76.20	3
83, or 82.55	3-1/4
89 or 88.90	3-1/2
95, or 95.25	3-3/4
102, or 101.60	4

CONVERSION TABLE FOR NOMINAL THICKNESS OF SHEET METAL

UNCOATED HOT AND COLD ROLLED SHEETS		HOT-DIPPED ZINC COATED SHEETS (GALVANIZED)	
METRIC THICKNESS SHOWN ON THE PLANS	EQUIVALENT US STANDARD GAGE	METRIC THICKNESS SHOWN ON THE PLANS	EQUIVALENT GALVANIZED SHEET GAGE
mm	inch	mm	inch
7.94	0.3125	4.270	0.1681
6.07	0.2391	3.891	0.1532
5.69	0.2242	3.510	0.1382
5.31	0.2092	3.132	0.1233
4.94	0.1943	2.753	0.1084
4.55	0.1793	2.372	0.0934
4.18	0.1644	1.994	0.0785
3.80	0.1495	1.803	0.0710
3.42	0.1345	1.613	0.0635
3.04	0.1196	1.461	0.0575
2.66	0.1046	1.311	0.0516
2.28	0.0897	1.158	0.0456
1.90	0.0747	1.006 or 1.016	0.0396
1.71	0.0673	0.930	0.0366
1.52	0.0598	0.853	0.0336
1.37	0.0538	0.777	0.0306
1.21	0.0478	0.701	0.0276
1.06	0.0418	0.627	0.0247
0.91	0.0359	0.551	0.0217
0.84	0.0329	0.513	0.0202
0.76	0.0299	0.475	0.0187
0.68	0.0269	-----	-----
0.61	0.0239	-----	-----
0.53	0.0209	-----	-----
0.45	0.0179	-----	-----
0.42	0.0164	-----	-----
0.38	0.0149	-----	-----

CONVERSION TABLE FOR WIRE

METRIC THICKNESS SHOWN ON THE PLANS mm	EQUIVALENT USA STEEL WIRE THICKNESS inch	GAGE NO.
6.20	0.244	3
5.72	0.225	4
5.26	0.207	5
4.88	0.192	6
4.50	0.177	7
4.11	0.162	8
3.76	0.148	9
3.43	0.135	10
3.05	0.120	11
2.69	0.106	12
2.34	0.092	13
2.03	0.080	14
1.83	0.072	15
1.57	0.062	16
1.37	0.054	17
1.22	0.048	18
1.04	0.041	19
0.89	0.035	20

CONVERSION TABLE FOR PIPE PILES

METRIC SIZE SHOWN ON THE PLANS mm x mm	EQUIVALENT IMPERIAL SIZE inch x inch
PP 360 x 4.55	NPS 14 x 0.179
PP 360 x 6.35	NPS 14 x 0.250
PP 360 x 9.53	NPS 14 x 0.375
PP 360 x 11.12	NPS 14 x 0.438
PP 406 x 12.70	NPS 16 x 0.500
PP 460 x T	NPS 18 x T"
PP 508 x T	NPS 20 x T"
PP 559 x T	NPS 22 x T"
PP 610 x T	NPS 24 x T"
PP 660 x T	NPS 26 x T"
PP 711 x T	NPS 28 x T"
PP 762 x T	NPS 30 x T"
PP 813 x T	NPS 32 x T"
PP 864 x T	NPS 34 x T"
PP 914 x T	NPS 36 x T"
PP 965 x T	NPS 38 x T"
PP 1016 x T	NPS 40 x T"
PP 1067 x T	NPS 42 x T"
PP 1118 x T	NPS 44 x T"
PP 1219 x T	NPS 48 x T"
PP 1524 x T	NPS 60 x T"

The thickness in inches (T") represents an exact conversion of the metric thickness in millimeters (T).

CONVERSION TABLE FOR STRUCTURAL TIMBER AND LUMBER

METRIC MINIMUM DRESSED DRY, SHOWN ON THE PLANS mm x mm	METRIC MINIMUM DRESSED GREEN, SHOWN ON THE PLANS mm x mm	EQUIVALENT NOMINAL US SIZE inch x inch
19x89	20x90	1x4
38x89	40x90	2x4
64x89	65x90	3x4
89x89	90x90	4x4
140x140	143x143	6x6
140x184	143x190	6x8
184x184	190x190	8x8
235x235	241x241	10x10
286x286	292x292	12x12

CONVERSION TABLE FOR NAILS AND SPIKES

METRIC COMMON NAIL, SHOWN ON THE PLANS Length, mm Diameter, mm	METRIC BOX NAIL, SHOWN ON THE PLANS Length, mm Diameter, mm	METRIC SPIKE, SHOWN ON THE PLANS Length, mm Diameter, mm	EQUIVALENT IMPERIAL SIZE Penny-weight
50.80 2.87	50.80 2.51	————	6d
63.50 3.33	63.50 2.87	————	8d
76.20 3.76	76.20 3.25	76.20 4.88	10d
82.55 3.76	82.55 3.25	82.55 4.88	12d
88.90 4.11	88.90 3.43	88.90 5.26	16d
101.60 4.88	101.60 3.76	101.60 5.72	20d
114.30 5.26	114.30 3.76	114.30 6.20	30d
127.00 5.72	127.00 4.11	127.00 6.68	40d
————	————	139.70 7.19	50d
————	————	152.40 7.19	60d

CONVERSION TABLE FOR IRRIGATION COMPONENTS

METRIC WATER METERS, TRUCK LOADING STANDPIPES, VALVES, BACKFLOW PREVENTERS, FLOW SENSORS, WYE STRAINERS, FILTER ASSEMBLY UNITS, PIPE SUPPLY LINES, AND PIPE IRRIGATION SUPPLY LINES SHOWN ON THE PLANS DIAMETER NOMINAL (DN) mm	EQUIVALENT NOMINAL US SIZE inch
15	1/2
20	3/4
25	1
32	1-1/4
40	1-1/2
50	2
65	2-1/2
75	3
100	4
150	6
200	8
250	10
300	12
350	14
400	16

8-1.02 APPROVED TRAFFIC PRODUCTS

The Department maintains the following list of Approved Traffic Products. The Engineer shall not be precluded from sampling and testing products on the list of Approved Traffic Products.

The manufacturer of products on the list of Approved Traffic Products shall furnish the Engineer a Certificate of Compliance in conformance with the provisions in Section 6-1.07, "Certificates of Compliance," of the Standard Specifications for each type of traffic product supplied.

Signing and delineation materials and products shall not be used in the work unless the material or product is on the list of Approved Traffic Products.

Materials and products may be added to the list of Approved Traffic Products if the manufacturer submits a New Product Information Form to the New Product Coordinator at the Transportation Laboratory. Upon a Departmental request for samples, sufficient samples shall be submitted to permit performance of required tests. Approval of materials or products will depend upon compliance with the specifications and tests the Department may elect to perform.

PAVEMENT MARKERS, PERMANENT TYPE

Retroreflective

- A. Apex, Model 921 (100 mm x 100 mm)
- B. Ray-O-Lite, Models SS (100 mm x 100 mm), RS (100 mm x 100 mm) and AA (100 mm x 100 mm)
- C. Stimsonite, Models 88 (100 mm x 100 mm), 911 (100 mm x 100 mm), 953 (70 mm x 114 mm)
- D. 3M Series 290 (89 mm x 100 mm)

Retroreflective With Abrasion Resistant Surface (ARS)

- A. Ray-O-Lite "AA" ARS (100 mm x 100 mm)
- B. Stimsonite, Models 911 (100 mm x 100 mm), 953 (70 mm x 114 mm)
- C. 3M Series 290 (89 mm x 100 mm)

Retroreflective With Abrasion Resistant Surface (ARS)

(Used for recessed applications)

- A. Stimsonite, Model 948 (58 mm x 119 mm)
 - B. Ray-O-Lite, Model 2002 (58 mm x 117 mm)
 - C. Stimsonite, Model 944SB (51 mm x 100 mm)*
 - D. Ray-O-Lite, Model 2004 ARS (51 mm x 100 mm)*
- *For use only in 114 mm wide (older) recessed slots

Non-Reflective For Use With Epoxy Adhesive, 100 mm Round

- A. Apex Universal (Ceramic)
- B. Highway Ceramics, Inc. (Ceramic)

Non-Reflective For Use With Bitumen Adhesive, 100 mm Round

- A. Apex Universal (Ceramic)
- B. Apex Universal, Model 929 (ABS)
- C. Elgin Molded Plastics, "Empco-Lite" Model 900 (ABS)
- D. Highway Ceramics, Inc. (Ceramic)
- E. Hi-Way Safety, Inc., Models P20-2000W and 2001Y (ABS)
- F. Interstate Sales, "Diamond Back" (ABS) and (Polypropylene)
- G. Alpine Products, D-Dot (ABS)
- H. Road Creations, Model RCB4NR (Acrylic)

PAVEMENT MARKERS, TEMPORARY TYPE

Temporary Markers For Long Term Day/Night Use (6 months or less)

- A. Apex Universal, Model 924 (100 mm x 100 mm)
- B. Davidson Plastics Corp., Model 3.0 (100 mm x 100 mm)
- C. Elgin Molded Plastics, "Empco-Lite" Model 901 (100 mm x 100 mm)
- D. Road Creations, Model R41C (100 mm x 100 mm)
- E. Vega Molded Products "Temporary Road Marker" (75 mm x 100 mm)

Temporary Markers For Short Term Day/Night Use (14 days or less)

(For seal coat or chip seal applications, clear protective covers are required)

- A. Apex Universal, Model 932
- B. Davidson Plastics, Models T.O.M., T.R.P.M., and "HH" (High Heat)
- C. Hi-Way Safety, Inc., Model 1280/1281

STRIPING AND PAVEMENT MARKING MATERIALS

Permanent Traffic Striping and Pavement Marking Tape

- A. Advanced Traffic Marking, Series 300 and 400
- B. Brite-Line, Series 1000
- C. Swarco Industries, "Director 35" (For transverse application only)
- D. Swarco Industries, "Director 60"
- E. 3M, "Stamark" Series 380 and 5730
- F. 3M, "Stamark" Series 420 (For transverse application only)

Temporary (Removable) Striping and Pavement Marking Tape (6 months or less)

- A. Brite-Line, Series 100
- B. P.B. Laminations, Aztec, Grade 102
- C. Swarco Industries, "Director-2"
- D. 3M, "Stamark," Series 620
- E. 3M Series A145 Removable Black Line Mask
(Black Tape: For use only on Asphalt Concrete Surfaces)
- F. Advanced Traffic Marking Black "Hide-A-Line"
(Black Tape: For use only on Asphalt Concrete Surfaces)

Preformed Thermoplastic (Heated in place)

- A. Flint Trading, "Premark" and "Premark 20/20 Flex"
- B. Pavemark, "Hotape"

Removable Traffic Paint

- A. Belpro, Series 250/252 and No. 93 Remover

CLASS 1 DELINEATORS

One Piece Driveable Flexible Type, 1700 mm

- A. Carsonite, Curve-Flex CFRM-400
- B. Carsonite, Roadmarker CRM-375
- C. Davidson Plastics, "Flexi-Guide Models 400 and 566"
- D. FlexStake, Model 654TM
- E. GreenLine Models HWD1-66 and CGD1-66
- F. J. Miller Industries, Model JMI-375 (with soil anchor)

Special Use Flexible Type, 1700 mm

- A. Carsonite, "Survivor" (with 450 mm U-Channel base)
- B. FlexStake, Model 604
- C. GreenLine Models HWD and CGD (with 450 mm U-Channel base)
- D. Safe-Hit with 200 mm pavement anchor (SH248-GP1)
- E. Safe-Hit with 380 mm soil anchor (SH248-GP2) and with 450 mm soil anchor (SH248-GP3)

Surface Mount Flexible Type, 1200 mm

- A. Bent Manufacturing Company, "Masterflex" Model MF-180EX-48
- B. Carsonite, "Super Duck II"
- C. FlexStake, Surface Mount, Models 704 and 754TM

CHANNELIZERS

Surface Mount Type, 900 mm

- A. Bent Manufacturing Company, "Masterflex" Models MF-360-36 (Round) and MF-180-36 (Flat)
- B. Carsonite, "Super Duck" (Flat SDF-436, Round SDR-336)
- C. Carsonite, "Super Duck II" Model SDCF203601MB "The Channelizer"
- D. Davidson Plastics, Flex-Guide Models FG300LD and FG300UR
- E. FlexStake, Surface Mount, Models 703 and 753TM
- F. GreenLine, Model SMD-36
- G. Hi-Way Safety, Inc. "Channel Guide Channelizer" Model CGC36
- H. The Line Connection, "Dura-Post" Model DP36-3 (Permanent)
- I. The Line Connection, "Dura-Post" Model DP36-3C (Temporary)
- J. Repo, Models 300 and 400
- K. Safe-Hit, Guide Post, Model SH236SMA

CONICAL DELINEATORS, 1070 mm

(For 700 mm Traffic Cones, see Standard Specifications)

- A. Bent Manufacturing Company "T-Top"
- B. Plastic Safety Systems "Navigator-42"
- C. Roadmaker Company "Stacker"
- D. Traffix Devices "Grabber"

OBJECT MARKERS

Type "K", 450 mm

- A. Carsonite, Model SMD-615
- B. FlexStake, Model 701KM
- C. Repo, Models 300 and 400
- D. Safe-Hit, Model SH718SMA
- E. The Line Connection, Model DP21-4K

Type "K-4" / "Q", 600 mm

(Shown as Type "Q" in the Traffic Manual)

- A. Bent Manufacturing "Masterflex" Model MF-360-24
- B. Carsonite, Super Duck II
- C. FlexStake, Model 701KM
- D. Repo, Models 300 and 400
- E. Safe-Hit, Models SH8 24SMA_WA and SH8 24GP3_WA
- F. The Line Connection, Model DP21-4Q

TEMPORARY RAILING (TYPE K) REFLECTORS AND CONCRETE BARRIER MARKERS

Impactable Type

- A. ARTUK, "FB"
- B. Davidson Plastics, Model PCBM-12
- C. Duraflex Corp., "Flexx 2020" and "Electriflexx"
- D. Hi-Way Safety, Inc., Model GMKRM100

Non-Impactable Type

- A. ARTUK, JD Series
- B. Stimsonite, Model 967 (with 83 mm Acrylic cube corner reflector)
- C. Stimsonite, Model 967LS
- D. Vega Molded Products, Models GBM and JD

THREE BEAM BARRIER MARKERS

(For use to the left of traffic)

- A. Duraflex Corp., "Railrider"
- B. Davidson Plastics, "Mini" (75 mm x 254 mm)

CONCRETE BARRIER DELINEATORS, 400 mm

(For use to the right of traffic. When mounted on top of barrier, places top of reflective element at 1200 mm)

- A. Davidson Plastics, Model PCBM T-16
- B. Safe-Hit, Model SH216RBM

CONCRETE BARRIER-MOUNTED MINI-DRUM (260 mm x 360 mm x 570 mm)

- A. Stinson Equipment Company "SaddleMarker"

SOUND WALL DELINEATOR

(Applied to a vertical surface. Top of reflective element at 1200 mm)

- A. Davidson Plastics, PCBM S-36

GUARD RAILING DELINEATOR

(Top of reflective element at 1200 mm above plane of roadway)

Wood Post Type, 686 mm

- A. Carsonite, Model 427
- B. Davidson Plastics FG 427 and FG 527
- C. FlexStake, Model 102 GR
- D. GreenLine GRD 27
- E. J. Miller Model JMI-375G
- F. Safe-Hit, Model SH227GRD

Steel Post Type

- A. Carsonite, Model CFGR-327 with CFGRBK300 Mounting Bracket

RETROREFLECTIVE SHEETING

Channelizers, Barrier Markers, and Delineators

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

Traffic Cones, 330 mm Sleeves

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

Traffic Cones, 100 mm and 150 mm Sleeves

- A. 3M Series 3840
- B. Reflexite Vinyl, "TR" (Semi-transparent) or "Conformalite"

Barrels and Drums

- A. Reflexite, "Super High Intensity" or "High Impact Drum Sheeting"
- B. 3M Series 3810

Barricades: Type I, Engineer Grade

- A. American Decal, Adcolite
- B. Avery Dennison, 1500 and 1600
- C. 3M, Scotchlite, Series CW

Barricades: Type II, Super Engineer Grade

- A. Avery Dennison, "Fasign" 2500 Series
- B. Kiwalite Type II
- C. Nikkalite 1800 Series

Signs: Type II, Super Engineer Grade

- A. Avery Dennison, "Fasign" 2500 Series
- B. Kiwalite, Type II
- C. Nikkalite 1800 Series

Signs: Type III, High-Intensity Grade

- A. 3M Series 3800
- B. Nippon Carbide, Nikkalite Brand Ultralite Grade II

Signs: Type IV, High-Intensity Prismatic Grade

- A. Stimsonite Series 6200

Signs: Type VII, High-Intensity Prismatic Grade

- A. 3M Series 3900

Signs: Type VI, Roll-Up Signs

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

SIGN SUBSTRATE FOR CONSTRUCTION AREA SIGNS

Aluminum

Fiberglass Reinforced Plastic (FRP)

- A. Sequentia, "Polyplate"
- B. Fiber-Brite

SECTION 8-2. (BLANK)

SECTION 8-3. (BLANK)

SECTION 9. DESCRIPTION OF BRIDGE WORK

The bridge work to be done consists, in general, of removal and replacement of units of aluminum louvers and placement of new units of aluminum louvers where no louvers existed before at:

CALDECOTT TUNNEL
(Bridge No's. 28-0015 and 28-0015R)

The work areas for this project are located above the roadway before the common entrance and just after the common exit for tunnel bores 1 and 2.

The overall work area at the West end of the tunnel is approximately 63 meters long and has a width that varies between 17 meters and 24 meters.

The overall work area at the East end of the tunnel is approximately 62 meters long and has a width that varies between 17 meters and 22 meters.

SECTION 10. CONSTRUCTION DETAILS

SECTION 10-1 GENERAL

10-1.00 CONSTRUCTION PROJECT INFORMATION SIGNS

Before any major physical construction work readily visible to highway users is started on this contract, the Contractor shall furnish and erect 2 Type 1 Construction Project Information signs at the locations designated by the Engineer.

The signs and overlays shall be of a type and material consistent with the estimated time of completion of the project and shall conform to the details shown on the plans.

The sign letters, border and the Department's construction logos shall conform to the colors (non-reflective) and details shown on the plans, and shall be on a white background (non-reflective). The colors blue and orange shall conform to PR Color Number 3 and Number 6, respectively, as specified in the Federal Highway Administration's Color Tolerance Chart.

The sign message to be used for fund types shall consist of the following, in the order shown:

FEDERAL HIGHWAY TRUST FUNDS
STATE HIGHWAY FUNDS

The sign message to be used for type of work shall consist of the following:

HIGHWAY IMPROVEMENT

The sign message to be used for the Year of Completion of Project Construction will be furnished by the Engineer. The Contractor shall furnish and install the "Year" sign overlay within 10 working days of notification of the year date to be used.

The letter sizes to be used shall be as shown on the plans. The information shown on the signs shall be limited to that shown on the plans.

The signs shall be kept clean and in good repair by the Contractor.

Upon completion of the work, the signs shall be removed and disposed of outside the highway right of way in conformance with the provisions in Section 7-1.13 of the Standard Specifications.

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 first order of work shall be to place the order for the electrical equipment. The Engineer shall be furnished a statement from the vendor that the order for the electrical equipment has been received and accepted by the vendor.

Bores 1 and 2 proposed luminaires shall be installed, tested, and approved by the Engineer before removing any existing luminaires. Modification of the control and power conductors is allowed with engineer approval.

Bore 3 north side proposed luminaires shall be installed, tested, and approved by the Engineer before modifying any existing south side luminaires. Modification of the control and power conductors is allowed with engineer approval.

The order of work for the SCADA system shall consist of constructing the project in sequential order as follows:

1. The contractor shall submit within 60 days after approval of the contract, a complete list of equipment which the Contractor proposes to install, manufacturer's catalog information of custom fabricated units and such other data as may be required by the Engineer and as shown below. The list shall include all items identified on the plans or in these special provisions by the manufacture's designation. The list shall be complete as to the name of manufacturer, catalog numbers, address, and telephone number. The catalog information shall contain information such as physical size, weight, rating and such additional data as may deemed necessary by the Engineer. All data submitted shall be clearly identified by the name of the project and shall be made in quadruplicate. Working drawings showing details of installation of each equipment shall be submitted to the Engineer along with the list of equipment. The list of equipment shall include the following items:
 - A. Programmable Logic Controllers (PLCs) - Hardware and Software upgrade
 - B. Supervisory Control and Data Acquisition (SCADA System-hardware and Software upgrade.
 - C. Tunnel Lighting System.
2. Training of engineering personnel about the theory and operation of the PLCs hardware and software, SCADA software and hardware, and tunnel lighting system.
3. Submittal of ladder logic and SCADA software configuration. Ladder logic shall include listing of all input and output with synonyms, circuit and page comments, cross reference of Input/Output (I/O) usage.
4. Delivery of upgrading PLCs hardware for remote site.
5. Installation.
6. PLCs and SCADA programming upgrade.
7. Testing
8. Operation and maintenance training.
9. Submittal of drawings, manuals, software documentation, and all final forms of corrected software configuration and corrected ladder logic.

10-1.02 MATERIAL CONTAINING AERIALY DEPOSITED LEAD

This work shall consist of handling soil contaminated by aerially deposited lead in conformance with the Standard Specifications and these special provisions.

Aerially deposited lead is typically found within the top 0.6-m of material in unpaved areas within the highway right of way. Levels of lead found near the project limits range from 3 to 2,500 mg/kg total lead, as analyzed by EPA Test Method 6010 or EPA Test Method 7000 series.

After the Contractor has completed handling materials containing aerially deposited lead, in conformance with the plans, Standard Specifications, and these special provisions, the Contractor shall have no responsibility for such materials in place and shall not be obligated for further cleanup, removal, or remedial actions for such materials.

Handling material containing aerially deposited lead shall be in conformance with all the rules and regulations of agencies including, but not limited to, the following:

California Division of Occupational Safety and Health Administration (Cal-OSHA)
California Regional Water Quality Control Board, Region 2.

The Contractor shall procure all permits and licenses, pay all charges and fees, except as otherwise provided in these special provisions, and give all notices necessary and incidental to the due and lawful prosecution of the work.

Full compensation for conforming to the requirements of this section, (except for the Lead Compliance Plan) 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.

HEALTH AND SAFETY

The Contractor shall prepare a project specific Lead Compliance Plan to prevent or minimize worker exposure to lead contamination in soil. Attention is directed to Title 8, California Code of Regulations, Section 1532.1, "Lead," for specific Cal-OSHA requirements when working with lead.

The Lead Compliance Plan shall contain all of the elements listed in Title 8, California Code of Regulations, Section 1532.1(e)(2)(B). Before submission to the Engineer, the Lead Compliance Plan shall be approved by an Industrial Hygienist certified in Comprehensive Practice by the American Board of Industrial Hygiene. The Plan shall be submitted to the Engineer at least 7 days prior to beginning work in areas containing aerially deposited lead.

Prior to performing work in areas containing lead, personnel who have no prior training, including State personnel, shall complete a safety training program provided by the Contractor, that meets the requirements of Title 8, California Code of Regulations, Section 1532.1, "Lead," and the Contractor's Lead Compliance Program.

Personal protective equipment, training, washing facilities, and medical surveillance required by the Contractor's Lead Compliance Plan shall be supplied to State personnel by the Contractor. The number of State personnel will be 3.

Lead Compliance Plan will be paid as a lump sum.

The contract lump sum price paid for Lead Compliance Plan shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all the work involved in preparing the Lead Compliance Plan, including paying the Certified Industrial Hygienist, and for providing personal protective equipment, training and medical surveillance, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

SOIL HANDLING

Handling of soils containing aurally deposited lead shall result in no visible dust migration. The Contractor shall have a dust palliative available at all times while handling soils in work areas containing aurally deposited lead.

The Contractor shall separate soil from vegetation and the soils shall remain on site.

Surplus soil excavated from areas containing aurally deposited lead shall remain in the area of soil disturbance. The surplus soil shall not be disposed of outside the highway right of way.

Full compensation for handling soil contaminated with aurally deposited lead, except as otherwise provided, 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.

10-1.03 WATER POLLUTION CONTROL

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

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 are also available for review at 111 Grand Avenue Oakland, California 94601. Please call the Construction Office Duty Senior, telephone number (510) 286 5209 to reserve a copy of the documents at least 24 hours in advance..

The Contractor shall know and fully comply with the applicable provisions of the Handbook 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.

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 whatsoever to the Contractor or property owner 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 liabilities 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 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 the remedies authorized by law, an amount of the money due the Contractor under the contract, as determined 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:

- A. The Department will give the Contractor 30 days notice of the Department's intention to retain funds from partial payments which may become due to the Contractor prior to acceptance of the contract. Retention of funds from payments made after acceptance of the contract may be made without prior notice to the Contractor.
- B. 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.
- C. 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 provisions in this section "Water Pollution Control" shall not relieve the Contractor from the Contractor's responsibilities as provided in Section 7, "Legal Relations and Responsibilities," of the Standard Specifications.

WATER POLLUTION CONTROL PROGRAM PREPARATION, APPROVAL AND UPDATES

As part of the water pollution control work, a Water Pollution Control Program, hereafter referred to as the "WPCP," is required for this contract. The WPCP shall conform to the provisions in Section 7-1.01G, "Water Pollution," of the Standard Specifications, the requirements in the Handbook, and these special provisions.

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

Within 15 days after the approval of the contract, the Contractor shall submit 3 copies of the WPCP to the Engineer. The Engineer will have 5 days to review the WPCP. If revisions are required, as determined by the Engineer, the Contractor shall revise and resubmit the WPCP within 5 days of receipt of the Engineer's comments. The Engineer will have 5 days to review the revisions. Upon the Engineer's approval of the WPCP, 3 additional copies of the WPCP incorporating the required changes shall be submitted to the Engineer. Minor changes or clarifications to the initial submittal may be made and attached as amendments to the WPCP. In order to allow construction activities to proceed, the Engineer may conditionally approve the WPCP while minor revisions or amendments are being completed.

The WPCP shall identify pollution sources that may adversely affect the quality of storm water discharges associated with the project and shall identify water pollution control measures, hereafter referred to as control measures, to be constructed, implemented, and maintained in order to reduce to the extent feasible pollutants in storm water discharges from the construction site during construction under this contract.

The WPCP shall incorporate control measures in the following categories:

- A. Soil stabilization practices;
- B. Sediment control practices;
- C. Sediment tracking control practices;
- D. Wind erosion control practices; and
- E. Nonstorm water management and 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 WPCP, and implement on the project, the listed minimum controls. In addition, the Contractor shall consider other control measures presented in the Handbook and shall incorporate into the WPCP and implement on the project the control measures necessary to meet the objectives of the WPCP. The Contractor shall document the selection process in conformance with the procedure specified in the Handbook. The following special minimum requirements are established:

Category	Minimum Requirement(s)
Sediment Control Practices	CD40 Storm Drain Inlet Protection
Non-Storm Water Management & Waste Management & Disposal.	CD8 Paving Operations, CD10 Material Delivery & Storage, CD12 Spill Prevention and Control, CD13 Solid Waste Management, & CD16 Concrete Waste Management.

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

- A. Project description and Contractor's certification;
- B. Project information;
- C. Pollution sources, control measures, and water pollution control drawings; and
- D. Amendments, if any.

The Contractor shall amend the WPCP, 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 WPCP shall be amended if the WPCP has not 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 WPCP, which are required on the project to control water pollution effectively. Amendments to the WPCP shall be submitted for review and approval by the

Engineer in the same manner specified for the initially approved WPCP. Amendments shall be dated and attached to the on-site WPCP document.

The Contractor shall keep a copy of the WPCP, together with updates, revisions and amendments at the project site.

WPCP IMPLEMENTATION

Upon approval of the WPCP, the Contractor shall be responsible throughout the duration of the project for installing, constructing, inspecting, and maintaining the control measures included in the WPCP 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 WPCP implementation shall continue throughout any temporary suspension of work ordered in conformance with the provisions in Section 8-1.05, "Temporary Suspension of Work," of the Standard Specifications. 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 October 1 and May 1.

Implementation of soil stabilization practices and sediment control measures for soil-disturbed areas on the project site shall be completed, except as provided for below, not 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 not more than 1.8 hectares. 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 on the project site before the onset of precipitation. A quantity of soil stabilization and sediment control materials shall be maintained on site equal to 100 percent of that sufficient to protect unprotected, soil-disturbed areas on the project site. A detailed plan for the mobilization of sufficient labor and equipment shall be maintained to fully deploy control measures required to protect unprotected, soil-disturbed areas on the project site prior to the onset of precipitation. A current inventory of control measure materials and the detailed mobilization plan shall be included as part of the WPCP.

Throughout the winter season, soil-disturbed areas on the project site shall be considered to be nonactive whenever soil disturbing activities are expected to be discontinued for a period of 20 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. 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 functioning control measures shall be deployed 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 WPCP for sediment tracking, wind erosion, nonstorm 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 provisions in 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 WPCP. The Contractor shall identify corrective actions and time needed to address any deficient measures or reinitiate any measures that have been discontinued.

The construction site inspection checklist provided in the Handbook shall be used to ensure that the necessary measures are being properly implemented, and to ensure that the control measures are functioning adequately. One copy of each site inspection record shall be submitted to the Engineer.

During the winter season, inspections of the construction site shall be conducted by the Contractor to identify deficient measures, as follows:

- A. Prior to a forecast storm;
- B. After all precipitation which causes runoff capable of carrying sediment from the construction site;
- C. At 24-hour intervals during extended precipitation events; and
- D. Routinely, at a minimum of once every 2 weeks.

If the Contractor or the Engineer identifies a deficiency in the deployment or functioning of an identified control measure, the deficiency shall be corrected immediately. The deficiency may be corrected at 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

Full compensation for conforming to the provisions in 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.

Those control measures which are shown on the plans and for which there is a contract item of work will be measured and paid for as that contract 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 provisions in this section "Water Pollution Control" as determined by the Engineer.

Retentions for failure to conform to the provisions in 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 provisions in this section will be released for payment on the next monthly estimate for partial payment following the date that a WPCP has been implemented and maintained and water pollution is adequately controlled, as determined by the Engineer.

10-1.04 COOPERATION

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

Work by State forces will be underway during the progress of the work under this contract.

It is anticipated that work by other Contractors may be in progress adjacent to or within the limits of this project during progress of the work on this contract. The following contracts, but not limited to, may be in progress of construction during same construction period of this contract:

Contract No. EA 04-151751, Traffic Operation System in Ala and CC Counties on Route 24 from Claremont Avenue Undercrossing to 0.8 KM East of Camino Pablo Road (R5.3/R10.0. R0.0/R4.5 KP).

Contract No. EA 04-279904, "On-going" emergency contract to repair drainage inside the tunnel bores.

The Contractor's operations shall be subject to coordination with the work conducted by State forces and other Contractors. The Contractor shall participate in weekly work planning discussions with the Superintendent of the Caldecott Tunnel, telephone no. 1-(510) 286-4748, for the purpose of coordinating his work with State forces and other Contractors and to each agreement on the time and location of lane closures for each following week's work.

The State forces will perform work of each lane closure during the progress of this contract.

The Contractor's attention is directed to Section "Maintaining Traffic" elsewhere in these special provisions concerning lane closures by State forces.

10-1.05 CONSTRUCTION AREA SIGNS

Construction area signs shall be furnished, installed, maintained, and removed when no longer required in conformance with the provisions in Section 12, "Construction Area Traffic Control Devices," of the Standard Specifications and these special provisions.

Attention is directed to the provisions in "Approved Traffic Products" of these special provisions. Type II retroreflective sheeting shall not be used on construction area sign panels.

Attention is directed to "Construction Project Information Signs" of these special provisions regarding the number and type of construction project information signs to be furnished, erected, maintained, and removed and disposed of.

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 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

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 "Approved Traffic Products" of these special provisions.

10-1.06 MAINTAINING TRAFFIC

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 provisions in "Public Safety" of 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.

Lane closures shall conform to the provisions in section "Traffic Control System for Lane Closure" of these special provisions.

The Contractor's attention is directed to Section "Cooperation" elsewhere in these special provisions concerning work coordination with State forces and other contractor.

Personal vehicles of the Contractor's employees shall not be parked within the right of way.

The Contractor shall notify local authorities of the Contractor's intent to begin work at least 5 days before work is begun. The Contractor shall cooperate with local authorities relative to handling traffic through the area and shall make arrangements relative to keeping the working area clear of parked vehicles.

Whenever vehicles or equipment are parked on the shoulder within 1.8 m of a traffic lane, the shoulder area shall be closed as shown on the plans.

Lanes 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 and 7-1.09, work that interferes with public traffic shall be performed only during the hours shown for lane closures.

Designated legal holidays are: January 1st, the third Monday in February, the last Monday in May, July 4th, the first Monday in September, November 11th, Thanksgiving Day, and December 25th. When a designated legal holiday falls on a Sunday, the following Monday shall be a designated legal holiday. When November 11th falls on a Saturday, the preceding Friday shall be a designated legal 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 the deviations in writing. All other modifications will be made by contract change order.

Lane Closure Chart																										
Multilane Lane Requirements																										
Location: Eastbound and Westbound																										
FROM HOUR TO HOUR	a.m.											p.m.														
	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	1	1	1	1	1																				1	1
Fridays	1	1	1	1	1																					1
Saturdays	1	1	1	1	1	1	1	1																		1
Sundays	1	1	1	1	1	1	1	1																	1	1
Day before designated legal holiday	1	1	1	1	1																					1
Designated legal holidays	1	1	1	1	1	1	1	1																	1	1
Legend:																										
1 Provide two adjacent lanes in each direction																										
No lane closure allowed																										
REMARKS: Coordinate lane closures, shown in this chart, with Maintenance Branch at Caldecott Tunnel																										

10-1.07 CLOSURE REQUIREMENTS AND CONDITIONS

Lane closures shall conform to the provisions in "Maintaining Traffic" of these special provisions and these special provisions.

The term closure, as used herein, is defined as the closure of a traffic lane or lanes, including ramp or connector lanes, within a single traffic control system.

CLOSURE SCHEDULE

By noon Monday, the Contractor shall submit a written schedule of planned closures for the following week period, defined as Friday noon through the following Friday noon.

The Closure Schedule shall show the locations and times when the proposed closures are to be in effect. The Contractor shall use the Closure Schedule request forms furnished by the Engineer. Closure Schedules submitted to the Engineer with incomplete, unintelligible or inaccurate information will be returned for correction and resubmittal. The Contractor will be notified of disapproved closures or closures that require coordination with other parties as a condition of approval.

Amendments to the Closure Schedule, including adding additional closures, shall be submitted to the Engineer, in writing, at least 3 working days in advance of a planned closure. Approval of amendments to the Closure Schedule will be at the discretion of the Engineer.

The Contractor shall confirm, in writing, all scheduled closures by no later than 8:00 a.m. 3 working days prior to the date on which the closure is to be made. Approval or denial of scheduled closures will be made no later than 4:00 p.m. 2 working days prior to the date on which the closure is to be made. Closures not confirmed or approved will not be allowed.

Confirmed closures that are cancelled due to unsuitable weather may be rescheduled at the discretion of the Engineer for the following working day.

CONTINGENCY PLAN

The Contractor shall prepare a contingency plan for reopening closures to public traffic. The Contractor shall submit the contingency plan for a given operation to the Engineer within one working day of the Engineer's request.

LATE REOPENING OF CLOSURES

If a closure is not reopened to public traffic by the specified time, work shall be suspended in conformance with the provisions in Section 8-1.05, "Temporary Suspension of Work," of the Standard Specifications. The Contractor shall not make any further 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 will have 2 working days to accept or reject the Contractor's proposed work plan. The Contractor will not be entitled to any compensation for the suspension of work resulting from the late reopening of closures.

For each 10-minute interval, or fraction thereof past the time specified to reopen the closure, the Department will deduct \$4,000 per interval from moneys due or that may become due the Contractor under the contract.

COMPENSATION

The Contractor shall notify the Engineer of any delay in the Contractor's operations due to the following conditions, and if, in the opinion of the Engineer, the Contractor's controlling operation is delayed or interfered with by reason of those conditions, and the Contractor's loss due to that delay could not have been avoided by rescheduling the affected closure or by judicious handling of forces, equipment and plant, the delay will be considered a right of way delay within the meaning of Section 8-1.09, "Right of Way Delays," and compensation for the delay will be determined in conformance with the provisions in Section 8-1.09:

- A. The Contractor's proposed Closure Schedule is denied and his planned closures are within the time frame allowed for closures in "Maintaining Traffic" of these special provisions, except that the Contractor will not be entitled to any compensation for amendments to the Closure Schedule that are not approved.
- B. The Contractor is denied a confirmed closure.

Should the Engineer direct the Contractor to remove a closure prior to the time designated in the approved Closure Schedule, any delay to the Contractor's schedule due to removal of the closure will be considered a right of way delay within the meaning of Section 8-1.09, "Right of Way Delays," and compensation for the delay will be determined in conformance with the provisions in Section 8-1.09.

Lanes shall be closed only by State forces and only during the hours shown on the charts included in this section "Maintaining Traffic." Except work required under Sections 7-1.08 and 7-1.09, work that interferes with public traffic shall be performed only during the hours shown for lane closures.

The full width of the traveled way shall be open for use by public traffic when construction operations are not actively in progress.

The Contractor's equipment and materials shall not remain in a lane except when the lane is closed to traffic and the lane is being used for contract operations.

Lane closure procedures shall conform to the following requirements:

- A. The State will furnish, locate and remove all signs, barricades, traffic cones, flag trees, and other devices required for lane closures at no cost to the Contractor. Bidders may examine the "Lane Closure Plan" at the Administration Building for the Caldecott Tunnel which indicates the signs, barricades, traffic cones, and flag trees which will be furnished, located and removed by State forces.
- B. The time required for State forces to furnish, locate and remove all traffic devices for lane closures, as provided above, is included within the time periods when lane closures are permitted.
- C. The Contractor shall maintain, at the Contractor's expense, all State-furnished signs, barricades, traffic cones, flag trees, and other traffic devices in the immediate work area.
- D. For night lane closures, the Contractor shall furnish, locate and, when no longer required, remove either a truck-mounted or trailer-mounted flashing arrow sign. The flashing arrow sign shall be located approximately 15 m in advance of each of the Contractor's work areas.

If a lane is closed for construction operations in conformance with the provisions of this section and it becomes necessary to clear the lane for use by public traffic due to congested conditions or for any other reason as determined by the Engineer, the Contractor shall immediately, upon notice from the Engineer, stop active contract operations and commence clearing the lane.

If the Contractor is ordered to clear a lane in conformance with these special provisions or there is a delay by the State in closing a lane to traffic and the Contractor is unable to begin work at the scheduled time, the Contractor will be compensated for the cost of this interruption to the Contractor's work as follows:

- A. The Contractor will be granted an extension of time commensurate with the delay in conformance with the provisions in Section 8-1.07, "Liquidated Damages," of the Standard Specifications.
- B. The Contractor will be compensated for the idle time of workers and equipment and the extra moving of equipment in conformance with the provisions in Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

The Contractor's vehicles will be subject to the provisions of Chapter 13, "Vehicular Crossings," of the Vehicle Code.

No lane closures shall be made when the atmospheric visibility is less than 300 m.

The provisions in this section will not relieve the Contractor of the responsibility to provide additional devices or take measures as may be necessary in conformance with the provisions in Section 7-1.09, "Public Safety," of the Standard Specifications.

10-1.08 TRAFFIC CONTROL SYSTEM FOR LANE CLOSURE

A traffic control system shall consist of closing traffic lanes in conformance with the details shown on the plans, the provisions in Section 12, "Construction Area Traffic Control Devices," of the Standard Specifications, the provisions under "Maintaining Traffic" and "Construction Area Signs" of these special provisions, and these special provisions.

The provisions in this section will not relieve the Contractor from the responsibility to provide additional devices or take measures as may be necessary to comply with the provisions in Section 7-1.09, "Public Safety," of the Standard Specifications.

A portable changeable message sign shall be placed in advance of each traffic control system at locations as directed by the Engineer. The sign shall be in place and in operation before any other component of the traffic control system is placed and shall remain in operation until all other components of the traffic control system are removed. Portable changeable message signs shall conform to the provisions in "Portable Changeable Message Signs," 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 components. Vehicles equipped with Type II flashing arrow sign not involved in placing, maintaining or removing components when operated within a stationary 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 vehicles which are being used to place, maintain and remove components of a traffic control system and shall be in place before a lane closure requiring its use is completed.

If components in the traffic control system are displaced or cease to operate or function as specified, from any cause, during the progress of the work, the Contractor shall immediately repair the components to the original condition or replace the components and shall restore the components to the original location.

When lane closures are made for work periods only, at the end of each work period, 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 designated 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 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 item 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. The 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, as provided in Section 4-1.03D of the Standard Specifications, will be paid for as a part of the extra work.

10-1.09 PORTABLE CHANGEABLE MESSAGE SIGN

Portable changeable message signs shall be furnished, placed, operated, and maintained at those locations shown on the plans or where designated by the Engineer in conformance with the provisions in Section 12, "Construction Area Traffic Control Devices," of the Standard Specifications and these special provisions.

Portable changeable message signs shall be placed in advance of each traffic control system as provided in "Traffic Control System for Lane Closure," elsewhere in these special provisions.

Portable changeable message signs shall be on the project at all times and available for use during detour, for public awareness information purposes and uses as directed by the Engineer.

Attention is directed to "Maintaining Traffic" of these special provisions regarding the use of the portable changeable message signs.

10-1.10 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, as specified in these special provisions or where designated by the Engineer. The grouping or array of sand filled modules shall form a complete sand filled temporary crash cushion in conformance 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 4.6 m 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 or Traffix Sand Barrels manufactured after March 31, 1997, or equal:

- A. 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.
 - 1. Distributor (Northern): Traffic Control Service, Inc., 8585 Thys Court, Sacramento, CA 95828, Telephone 1-800-884-8274, FAX 1-916-387-9734
 - 2. Distributor (Southern): Traffic Control Service, Inc., 1881 Betmor Lane, Anaheim, CA 92805, Telephone 1-800-222-8274, FAX 1-714-937-1070.
- B. Fitch Inertial Modules, manufactured by Roadway Safety Service, Inc., 1050 North Rand Road, Wauconda, IL 60084, Telephone 1-800-426-0839, FAX 1-847-487-9820.
 - 1.. Distributor (Northern): Traffic Control Service, Inc., 8585 Thys Court, Sacramento, CA 95828, Telephone 1-800-884-8274, FAX 1-916-387-9734

2. Distributor (Southern): Traffic Control Service, Inc., 1881 Betmor Lane, Anaheim, CA 92805, Telephone 1-800-222-8274, FAX 1-714-937-1070.

C. Traffix Sand Barrels, manufactured by Traffix Devices, Inc., 220 Calle Pintoresco, San Clemente, CA 92672, Telephone 1-949-361-5663, FAX 1-949-361-9205.

1. Russ Enterprises, Inc., 1533 Berger Drive, San Jose, CA 95112, Telephone 1-408-287-4303, FAX 1-408-287-1929.
2. Statewide Safety, P.O. Box 1440, Pismo Beach, CA 93448, Telephone 1-800-559-7080, FAX 1-805-929-5786.

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 herein 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 conformance with the manufacturer's directions, and to the sand capacity in kilograms for each module 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 the crash cushion array is within 3.6 m 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 determined 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 the permanent work.

MEASUREMENT AND PAYMENT

Temporary crash cushion modules placed in conformance with the provisions in "Public Safety" of these special provisions will not be measured nor paid for.

10-1.11 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.

Plans of the existing bridges may be requested by fax from the Office of Structure Maintenance and Investigations, 1801 30th Street, Sacramento, CA, Fax (916) 227-8357.

Plans of the existing bridges available to the Contractor are reproductions of the original contract plans with significant changes noted 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 the existing bridges, the Contractor shall verify the controlling field dimensions and shall be responsible for adjusting dimensions of the work to fit existing conditions.

10-1.12 BRIDGE REMOVAL (PORTION)

Removing portions of bridges shall conform to the provisions in Section 15-4, "Bridge Removal," of the Standard Specifications and these special provisions.

The removal work consists of removing specified panels of existing aluminum louver units, including adjacent aluminum border plates and redwood nailers, from the overhead areas adjacent to the entrance and exit portions of the Caldecott tunnel briefly described as follows:

CALDECOTT TUNNEL
(Bridge No's. 28-0015 and 28-0015R)

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 outside the highway right of way in conformance with the provisions in Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications.

The following additional requirements apply to the removal of portions of bridges that are over or adjacent to roadways that may be closed to public traffic for only brief periods of time:

- A. The closure of roadways to public traffic shall conform to the requirements under "Order of Work" and "Maintaining Traffic" of these special provisions.
- B. Prior to closing a roadway to traffic to accommodate aluminum louver removal operations, the Contractor shall have all necessary workers, materials and equipment at the site as needed to proceed with the removal work in an expeditious manner. While the roadway is closed to public traffic, work shall be pursued promptly and without interruption until the roadway is reopened to public traffic.
- C. All removal operations shall be performed during periods of time that one tunnel bore or the other is closed to public traffic except as specified herein for preliminary work.
- D. Preliminary work shall be limited to operations that will not reduce the structural strength or stability of the aluminum louver units being removed, or any element thereof, to a level which, in the judgment of the Engineer, would constitute a hazard to the public. This preliminary work shall also be limited to operations that cannot cause debris or any other material to fall onto the roadway.
- E. During periods when the roadway through a tunnel bore is closed to public traffic, debris from aluminum louver removal operations will not be allowed to fall directly onto the lower roadway. Prior to reopening the roadway to public traffic, all debris, shall be removed and the roadway swept clean with wet power sweepers or equivalent methods.
- F. The removal operations shall be conducted in such a manner that the portion of the louver units or related elements not yet removed remains in a stable condition at all times.

10-1.13 ALUMINUM LOUVER AND BORDER PLATE UNITS

Aluminum louver and border plate units shall consist of furnishing the material, fabricating, and installing custom fabricated aluminum louver and border plates units in conformance with the details shown on the plans and these special provisions.

Two sets of working drawings showing details of the fabrication of the new louver and border plate units, including a material list of new material, and the type of sheet aluminum for use and the specifications therefor, shall be furnished by the Contractor to the Engineer for the Engineer's use in administering the contract in conformance with the provisions in Section 5-1.02, "Plans and Working Drawings," of the Standard Specifications.

Working drawings shall be submitted in two installments. One submittal shall include the louver and border plate unit work above both East and West ends of Tunnel Bore 1. The other submittal shall include the louver and border plate unit work above both East and West ends above Tunnel Bore 2. Except as otherwise provided in these special provisions, the Contractor shall allow 4 weeks after each of the two submittals, which include complete drawings and all support data, are submitted for the review by the Engineer.

Should the Engineer fail to complete the review within the time allowance and if, in the opinion of the Engineer, the Contractor's controlling operation is delayed or interfered with by reason of the delay in louver and border plate unit plan review, the delay will be considered a right of way delay as specified in Section 8-1.09, "Right of Way Delays."

Aluminum sheets used to fabricate the new louvers, border plates, aluminum caps, and aluminum splice plates shall be ASTM designation B 209. Aluminum sheets shall have a clear anodized finish conforming with the aluminum Association designation AA-M12C22A31.

Abraded and damaged surfaces of the aluminum shall be repaired as recommended by the fabricator and approved by the Engineer.

At the West portal, the aluminum louver and border plate units, both existing and new, are continuous and have border plate on two sides only and are supported on those two sides only by a redwood nailer, as shown on plans.

At the East portal, the aluminum louver and border plate units, both existing and new, are non continuous, are separate individual louver and border plate units, and each unit has border plate on all 4 sides which is supported on the 4 sides by a redwood nailer, as shown on the plans.

The existing aluminum border plate units are connected to the existing redwood nailer with brass screws. When these screws are removed for any reason, they shall not be reused. Instead stainless steel screws, as described elsewhere in these special provisions, shall be used to reattach the existing or new border plate to the existing or new redwood nailer as shown on the plans. New stainless steel screws shall not be placed in the holes where the brass screws were removed. The spacing of the new stainless steel screws shall be as shown on the plans.

At the West Portal only, the oblique vanes only, shall be spliced as shown on the plans. Vertical vanes shall not be spliced at any location on this project.

All connections between the aluminum components of the louver and border plate units shall be made using all aluminum rivets, as shown on the plans. These rivets shall have a length of 12.7 mm, a grip range of 1.6 to 6.4 mm, and shall have a minimum shear strength of 2430N and a minimum tension strength of 3550N. The drill size for the rivet holes shall be 6.5 mm and the diameter of the holes for the rivets shall be between 6.53 and 6.63 mm. The rivets shall be 5052 aluminum body, aluminum mandrel, IFI Grade 11.

The stainless steel screws shall be No. 10 by 25 mm, 18-8 stainless steel, hex-head, unslotted, self tapping screws.

At the East end of the tunnel bores the area for pay for the new aluminum louver and border plate units will be determined from measurements representing average width and average length, between the near vertical faces of the redwood nailers. The average width and average length shall be the distance measured from the mid point on one side of the opening to the mid point on the other side of the opening, and from the mid point on one end of the opening to the mid point on the other end of the opening. At the West end of the tunnel bore, measurement for width shall be as noted above for the East end of the tunnel bore and the length shall be measured end to end along the longitudinal centerline of the new louver unit. New aluminum louver and border plate units will be measured and paid for by the square meter of the units

The contract price paid per square meter for aluminum louver and border plate units shall include shop drawings, furnishing, fabricating, and installation of the aluminum louver and border plate units, including removal of existing aluminum vane splice plates, furnishing and placement of new splice plates, furnishing and placement of new aluminum caps, and including furnishing and placing of the aluminum rivets and the stainless steel screws, complete and in place, as shown on the plans, and as described in these special provisions.

10-1.14 EARTHWORK

Earthwork shall conform to the provisions in Section 19, "Earthwork," of the Standard Specifications and these special provisions.

Attention is directed to "Aerially Deposited Lead" elsewhere in these special provisions.

All material excavated from areas containing aerially deposited lead shall be used as backfill or dispersed within the project limits in accordance with Section 19-2.06, "Surplus Material," of the Standard Specifications. None of these materials shall be disposed of outside the highway right of way.

Excavation, transportation, placement and handling of soils contaminating aerially deposited lead shall result in no visible dust. The Contractor shall have a water truck available at all times while performing earthwork, excavation or grubbing activities in work areas containing aerially deposited lead.

Full compensation for conforming to the requirements of this section involving materials containing aerially deposited lead, except as otherwise specifically provided in these special provisions, 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.

Any additional requirements needed to complete the work, as determined by the lead sampling and analysis results, will be paid as extra work in accordance with Section 4-1.03D, "Extra Work," of the Standard Specifications.

10-1.15 REDWOOD NAILERS

Redwood Nailers shall consist of furnishing and placing redwood lumber nailers of various sizes, and their various attachments as shown on the plans and as described in these special provisions. Redwood nailers shall be Redwood No. 2, S4S. Painting of redwood nailers will not be required.

Hardware for attaching the Redwood Nailers to the existing supports shall conform to the requirements of Section 75-1.03, "Miscellaneous Bridge Metal," of the Standard Specifications. Size of redwood nailer shall be as shown on the plans. Bolts shall be located so that the existing bolt holes are reused and no further drilling will be allowed.

Redwood nailer will be measured and paid for by the cubic meter for redwood nailer, placed to receive existing louver units as reattached, or to receive new louver units. The quantity of redwood nailer to be paid for shall be determined from the actual widths and thicknesses and the actual lengths of the redwood nailer pieces in the finished structure.

The contract price paid per cubic meter for Redwood nailers shall include full compensation for furnishing all labor, materials (including hardware to attach the nailers to the supports), tools, equipment, and incidentals, and for doing all the work involved in furnishing and placing the redwood nailers, including the work required to disconnect, lift, place new redwood nailers under portions of existing louver units, and reattach existing louver units to new and to existing redwood nailers, complete in place, 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. TUNNEL LIGHTING AND ELECTRICAL SYSTEMS

10-3.01 DESCRIPTION

Tunnel lighting (modify) shall conform to the provisions in Section 86, "Signals, Lighting and Electrical Systems," of the Standard Specifications and these special provisions.

Tunnel lighting (modify) involves converting existing uncontrolled fluorescent lighting system into a controlled high pressure sodium lighting system at each tunnel as shown on the plans and shall consist of the following systems:

1. Bore 1 Luminaire Layout
2. Bore 2 Luminaire Layout
3. Bore 3 Luminaire Layout
4. Bore 1 and 2 Screen Luminaire Layout
5. Modify Pylon and Approach Lighting
6. Bore 1 and 2 Existing Equipment Removal
7. Bore 3 Existing Equipment Removal .
8. West Portal Conduit Layout Plan
9. West Portal Bore 3 Substation Layout
10. West Portal Bore 3 Fan Room & Control Room
11. West Portal Bore 1 And 2 Electrical Plan
12. East Portal Bore 2 Substation Layout
13. East Portal Exhaust Duct Plan
14. East Portal Bore 3 Electrical Partial Plan
15. SCADA and PLCs programming
16. West portal photo sensor conduit run
17. East portal photo sensor conduit run
18. Structure's need to be finished
19. Electrical spare parts

10-3.02 ABBREVIATIONS

The following abbreviations are added to those listed in Section 1-1.02, "Abbreviations," of the Standard Specification:

CSA	Canadian Standards Association
ETL	ETL Testing Laboratories
IPCEA	Insulated Power Cable Engineering Association
ITE	Institute of Transportation Engineers
JIC	Joint Industry Conference
REA	Rural Electrification Administration

10-3.03 CODES AND STANDARDS

All work performed and material installed or furnished on 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. All local ordinances.

10-3.04 COST BREAK-DOWN

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

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

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

The cost breakdown shall be divided in the following categories. Within each category, each item of work shall be broken down, as a minimum, to include the following listed items:

Bore 1 Luminaire Layout

- conductors - each size and type
- equipment rentals - each over \$500
- conduit - list by each size and installation method
- conduit bodies and adapters- each size and type
- concrete anchors - each size and type
- conduit clamps and hangers - each size and type
- luminaires - each type and wattage

Bore 2 Luminaire Layout

- conductors - each size and type
- equipment rentals - each over \$500
- conduit - list by each size and installation method
- conduit bodies and adapters- each size and type
- concrete anchors - each size and type
- conduit clamps and hangers - each size and type
- luminaires - each type and wattage

Bore 3 Luminaire Layout

- conductors - each size and type
- equipment rentals - each over \$500
- conduit - list by each size and installation method
- liquid tight flexible conduit and fittings - size
- conduit bodies and adapters- each size and type
- concrete anchors - each size and type
- conduit clamps and hangers - each size and type
- luminaires - each type and wattage
- electronic enclosures - all equipment contained within

Modify Pylon and Approach Lighting

- conductors - each size and type
- equipment rentals - each over \$500

Bore 1 and 2 Existing Equipment Removal

- equipment rentals - each over \$500
- removal of existing equipment - lump sum for all excavation, disposing and hauling - total

Bore 3 Existing Equipment Removal

- equipment rentals - each over \$500
- removal of existing equipment - lump sum for all excavation, disposing and hauling - total

West Portal Conduit Layout Plan

- Equipment Rental-Each over \$ 500
- Pull Boxes-Each Type
- Conduits-Each Size and Installation Method
- Conduit Support-Each Type and Installation method
- Concrete Anchors-Each Size and Type

West Portal Bore 3 Substation Layout

- Circuit Breakers-Each Size and Type

- Panel Boards-Each Size and Type
- Contactor Panel-Installation Wiring and Testing
- UPS-Installation Wiring and Testing
- Conductors-Each Size and Type
- Conduits-Each Size and Installation method
- Wireways-Each Size and Type
 - Conduit and Wireway supports- Each type and installation method
 - Concrete Anchors-Each Size and Type
 - Junction Box-Each Size and Type
- West Portal Bore 3 Fan Room & Control Room
 - Conduits-Each Size and Installation Method
 - Conduit Support-Each Type and Installation method
 - Concrete Anchors-Each Size and Type
 - Electrical Modification-Each Type and Method
- West Portal Bore 1 And 2 Electrical Plan
 - Circuit Breakers-Each Size and Type
 - Panel Boards-Each Size and Type
 - Contactor Panel-Installation Wiring and Testing
 - UPS-Installation Wiring and Testing
 - Conductors-Each Size and Type
 - Conduits-Each Size and Installation method
 - Wireways-Each Size and Type
 - Conduit and Wireway supports- Each type and installation method
 - Concrete Anchors-Each Size and Type
 - Junction Box-Each Size and Type
- East Portal Bore 2 Substation Layout
 - Circuit Breakers-Each Size and Type
 - Panel Boards-Each Size and Type
 - Contactor Panel-Installation Wiring and Testing
 - UPS-Installation Wiring and Testing
 - Conductors-Each Size and Type
 - Conduits-Each Size and Installation method
 - Wireways-Each Size and Type
 - Conduit and Wireway supports- Each type and installation method
 - Concrete Anchors-Each Size and Type
- East Portal Exhaust Duct Plan
 - Conduit-Each Type and Installation Method
 - Conduit and supports- Each type and installation method
 - Concrete Anchors-Each Size and Type
 - Junction Box-Each Size and Type
- East Portal Bore 3 Electrical Partial Plan
 - Circuit Breakers-Each Size and Type
 - Panel Boards-Each Size and Type
 - Contactor Panel-Installation Wiring and Testing
 - Conductors-Each Size and Type
 - Conduits-Each Size and Installation method
 - Wireways-Each Size and Type
 - Conduit and Wireway supports- Each type and installation method
 - Concrete Anchors-Each Size and Type
 - Junction Box-Each Size and Type
 - Pull Boxes-Each Type
 - Equipment Rental-Each over \$500
- SCADA modifications
 - Hardware delivery
 - SCADA and PLCs programming, database, and graphics as required
 - Hardware installation and wiring termination
 - Testing and startups
 - Engineering submittals and O&M manuals
- West portal photo sensor conduit run

Materials -Conduit, conduit fittings, conductors, pull boxes and photo sensor.
Installation - Trench, remove/reinstall traffic barriers, cable pulling and termination.
East portal photo sensor conduit run
Materials-Conduit, conductors, photo sensor
Installation- Cable pulling, and terminations
PLC system. Attention is directed to the "EVALUATION PERIOD" of these Special Provisions for special conditions relating to cost break-down and payment.

Electrical spare parts:

- ballasts
- lamps
- ignitors
- indicator lamps
- fuses
- luminaires
- electronic dimming modules
- lighting contactors
- relays

10-3.05 EQUIPMENT LIST AND DRAWINGS

A maintenance manual shall be furnished for all SCADA, PLC Modules UPS and photo sensors The maintenance manual and operation manual may be combined into one manual. The maintenance manual or combined maintenance and operation manual shall be submitted at the time the controllers are delivered for testing or, if ordered by the Engineer, prior to purchase. The maintenance manual shall include, but need not be limited to, the following items:

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

The Contractor shall submit for approval within 60 calendar days after approval of the contract, a complete list of equipment which the Contractor proposes to install, manufacturer's catalog information, shop drawings of custom fabricated units and such other data as required by the Engineer.

Drawings submitted by the Contractor shall be approximately the same size as the contract plans (0.6 meter x 1.0 meter).

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. Cables and conductors, splices and terminations.
- 2. Conduits, liquid tight conduits and fittings, conduit bodies, clamps, hangers, fittings, straps.
- 3. Junction boxes, cabinets, panels, enclosures, covers.
- 4. Luminaires, tubes, hangers, brackets, fuses, ignitors, ballasts, and other components.
- 5. PLCs and other Controllers and control equipment including programming.
- 6. Hardware, fasteners, screws, bolts, nuts, washers.
- 7. Equipment and material removal and hauling.
- 8. Temporary equipment installation and removal.
- 9. Electrical components.
- 10. Sealants and compounds.
- 11. UPS installation and user manual.
- 12. Photo sensors
- 13. Structure's if applicable

Full compensation for manuals, equipment listing and drawings shall be considered as included in the contract lump sum prices paid for the various contract items of work involved and no additional compensation will be allowed therefor.

10-3.06 MAINTAINING AND PROTECTING EXISTING AND TEMPORARY ELECTRICAL SYSTEMS

Maintaining existing and temporary electrical systems--The Contractor shall provide any and all necessary temporary facilities as required to keep any and all electrical facilities in continuous operation. The Contractor is responsible for coordinating all electrical work with all other Contractors, State forces, and entities. Temporary electrical facilities shall be installed as required prior to other work that may effect the electrical facilities. Where damage to facilities is caused by the Contractor’s operations, the Contractor shall, at the Contractor’s expense, repair or replace damaged facilities 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.

Protecting existing and temporary electrical systems--Protection of existing electrical systems and facilities shall consist of providing temporary support and protection for the equipment, utilities, and other facilities within the scope of this contract, and shall conform to the provision in section 7-1.11 “Preservation of Property,” of the Standard Specifications.

In addition to the above requirements, the Contractor is also responsible for maintaining the integrity of the existing computer systems including software. The Contractor is required to modify the existing software as directed elsewhere in these Special Provisions, but the modifications shall in no way affect the function of the existing software or computer system.

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.

10-3.07 CONDUIT, CONDUIT BODIES, AND CONDUIT SUPPORTS

CONDUIT

Conduit to be installed underground shall be Type 1 or Type 3 unless otherwise specified.

The conduit in a foundation and between a foundation and the nearest pull box shall be Type 1.

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

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

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

When Type 3 conduit is placed in a trench (not in pavement or under portland cement concrete sidewalk), after the bedding material is placed and the conduit is installed, the trench shall be backfilled with commercial quality concrete, containing not less than 250 kg of portland cement per cubic meter, to not less than 100 mm above the conduit before additional backfill material is placed.

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

At those locations where conduit is required to be installed under pavement and existing underground facilities require special precautions in conformance with the provisions in "Obstructions" of these special provisions, conduit shall be placed by the "Trenching in Pavement Method" in conformance with the provisions in Section 86-2.05C, "Installation," of the Standard Specifications.

At locations where conduit is required to be installed under pavement and if a delay to vehicles will not exceed 5 minutes, conduit may be installed by the "Trenching in Pavement Method."

All flexible conduit shall be the metal type. Liquid tight flexible metal conduit and materials and installation shall comply with Article 351 of the NEC. All conduits, connectors, devices, materials shall be UL listed.

CONDUIT BODIES.-- All conduit bodies shall be rated for type for Class I, Division 2 areas. The conduit body shall consist of the body proper, a gasket, and a cover.

The conduit body proper shall be composed of cast iron alloy. The finish shall include zinc electroplating and acrylic or epoxy paint. The conduit bodies shall be UL listed, and comply with ANSI Standard C33.84 and C80.4.

The gasket shall be neoprene, and shall be the solid gasket type.

The cover shall be sheet steel, sheet aluminum, or cast iron alloy with the same finish as the body proper.

CONDUIT AND LTF SUPPORT.--All conduits and LTF shall be supported with hangers, brackets, conduit straps, and supports that shall be secured to concrete, masonry, or tile surfaces by means of expansion bolts described elsewhere in these Special Provisions.

For conduit runs in the tunnel ceiling, two hole malleable iron clamps shall be used unless otherwise depicted on the plans. Conduit supports shall be installed in locations where required by the NEC, and shall be suitable for the installation.

In areas exposed to traffic, LTF shall be supported at less than 0.5 meter intervals, and within 0.3 meters of a LTF fitting.

10-3.08 CONDUCTORS AND WIRING

Splices shall be insulated by "Method B" .

All ends of unused conductors shall be insulated with electrical PVC tape.

Conduit fill capacities are based on specific types of insulation. Type TW insulation shall be used for all conductors smaller than #2 unless otherwise shown on the plans or elsewhere in these Special Provisions. Type THWN insulation shall be used for all conductors larger than #2 unless otherwise shown on the plans or these Special Provisions.

The Contractor shall provide the Engineer with 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 of the cables and conductors furnished for the project.

10-3.09 LUMINAIRES, LAMPS, WIRING METHOD, TESTING, LIGHTING CONTROL EQUIPMENT

10-3.09A WALL MOUNTED LUMINAIRES

All wall mounted luminaires 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, ignitors, lamps, and other equipment 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 at 100% rated lumen output, meet the requirements of UL 595 marine, and comply with IP 65 for dust and water jet.

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 or 383 with a minimum thickness of 3 mm. 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 0.8 mm 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 and hangers required shall be Type 316 stainless steel.
6. Fasteners shall be Type 316 stainless steel or polymer coated steel of the "TAPTITE" type.
6. Lampholders and lamp sockets shall hold lamps securely.
7. Gasketing shall be extruded Silicone Rubber. All shapes used shall be completely cover flange to which gasket is affixed.

Finish.--The luminaire housing shall be finished with a polyester powder paint which shall be electrostatically applied and cured. The paint shall pass the ASTM D522 flexure test.

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 minimum. The sockets shall be pulse rated at 4 kV. The screw shell shall be nickel-plated brass and shall incorporate anti-vibration grips.

Ballasts.--The ballast shall comply with Section 86.601A "High Pressure Sodium Ballast" of the Standard Specifications with the following modifications.

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) rated 125° C or higher or type SEO cable rated at 105° C. 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 2 fast-acting type fuses 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.

Glare Shield.--All 400 W luminaires shall have a factory installed glare shield or other glare inhibiting feature designed as an integral part of the luminaire. The glare shield shall be oriented to minimize glare to the on coming traffic.

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 or removable tray shall contain all electrical components with a quick disconnect plug and shall be hinged or slotted 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.

The conduit connection shall be National Pipe Thread type typical for conduit, and shall be sized to match the attaching conduit. Note that the attaching conduit is of various sizes so that not all conduit connections will be the same. Field modification is prohibited.

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 4.5 mm minimum thickness minimum 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.--If mounting brackets are required, the brackets shall be integral to a bolted metal framing system. 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, and shall have the following characteristics:

1. 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.
2. Be capable of being used with the type of ballasts used in this project.
3. Be designed so that a cycling or extinguishing lamp shall not adversely affect the ignitor or ballast
4. Be UL listed or UL Component Recognized and CSA Certified.
5. Be warranted against defective materials and workmanship for a period of at least five years.

The 150 watt continuous lighting luminaires shall be equipped with an ignitor which complies with the above requirements in addition to having a HOT RESTRIKE capability. The Hot Restrike capability shall comply with the following:

- 1) The ignitor shall be compatible with the lamp base and ballast without modification of any component.
- 2) The ignitor shall provide a starting pulse to restrike the lamp within 2 seconds.
- 3) The starting pulse shall be compatible with the lamp and lamp base.
- 4) The ignitor shall respond to voltage dips that extinguish the lamp.

- 5) The ignitor shall not alter or compromise the lamp light output.
- 6) The ignitor shall be rated 90° C.

Fuse Block.--All luminaires shall have a fuse block installed inside the electrical section of the housing. The fuse block shall comply with Section 86.605G "Fuse Block" of the Standard Specifications with the following modifications:

1. Shall be UL listed and shall have two spaces for fuses.
2. Each terminal lug shall be large enough to accept conductors as depicted on the plans and shall be rated 600 volts.
3. Shall have fuses installed with the amperage rating as shown on the plans.

Installation.--The installation of the luminaires shall be according to the plans, the manufacturer's instructions, and adjusted per field conditions with the Engineers approval.

Qualifying Luminaires.--The manufacturer of the luminaires shall meet the following qualifications:

- 1.. Shall have no less than 10 years experience in manufacturing tunnel lighting.
2. Shall have no less than 20 tunnels in the United States where the proposed luminaire are installed.
3. Shall have no less than 1,000 of the proposed luminaires in operation in the United States.
4. Shall provide to the engineer a list of the qualifying projects for verification.

Certificate of Compliance.-- The Contractor shall provide the Engineer with 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 of the luminaires furnished for the project.

Warranty.--The entire luminaire shall be have a complete warranty of at least 5 years.

10-3.09B CONTINUOUS LUMINAIRES

All continuous luminaires 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 units shall be complete with ballasts, ignitors, lamps, dimmers, capacitors, relays, and other equipment as required 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 at 100% rated lumen output, meet the requirements of UL 595 marine, and comply with IP 65 for dust and water jet.

The lighting units shall be composed of three parts: a remote located electronics enclosure, a luminaire assembly, and a light refraction guide assembly (s).

Remote located electronics assembly.-- All electrical equipment and devices required to make the luminaire function shall be located within a NEMA 4 cabinet suitably sized and partitioned to contain these equipment and devices. The enclosure type and size shall comply with the manufacturer's requirements.

The electronic components shall include a ballast, ignitor, dimming relay, capacitors, dimming electronics, and other equipment as required.

Ballast.-- The ballast shall comply with Section 86.601A "High Pressure Sodium Ballast" of the Standard Specifications with the following modifications.

They 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 other equipment.

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, and shall have the following characteristics:

1. 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.
2. Be capable of being used with the type of ballasts used in this project.
3. Be designed so that a cycling or extinguishing lamp shall not adversely affect the ignitor or ballast
4. Be UL listed or UL Component Recognized and CSA Certified.
5. Be warranted against defective materials and workmanship for a period of at least five years.

ranted against defective materials and workmanship for a period of at least five years.
All ignitors shall be of the same manufacturer and model number or shall have the same external dimensions and be physically and functionally interchangeable.

Dimming Relay.--The dimming relay shall be the enclosed general purpose square or octal base - plug in type, and shall include the appropriate socket. It shall have at least 5 mounting pins, and shall be the SPDT type. The contacts shall be the silver alloy type rated at least 13 amperes at 120 volts AC. The coil rating shall be less than 18 miliamperes at 120 volts AC. All dimming relays shall be of the same manufacturer and model number or shall have the same external dimensions and be physically and functionally interchangeable. All dimming relays shall be UL recognized and CSA certified.

Dimming Electronics.--The dimming electronics shall be suitable for dimming High Pressure Sodium lighting, and interface with other equipment and devices in the electronics assembly. The dimming electronics shall be designed for switching at the zero crossing. The Dimming electronics shall include the following features:

- 1) Pre-Wired with a bi-level capacitor appropriate for High Pressure Sodium lamp, ignitor, and ballast.
- 2) Operating temperature range of -23°C to 40° C.
- 3) Unit current consumption shall be less than 18 miliamperes at 24 volts DC.
- 4) Dim to a pre-set level with a contact closure input.
- 5) The Dim level shall be set to 33% of the lumen output of the tube.

Fuse Block.--A fuse block shall be installed. The fuse block shall comply with Section 86.605G "Fuse Block" of the Standard Specifications with the following modifications.

The fuse block shall be UL listed, shall have two spaces for fuses, each terminal lug shall be large enough to accept conductors as depicted on the plans, shall be rated 600 volts, and shall have fuses installed, amperage per the plans.

Luminaire assembly.--The luminaire assembly shall have a cylindrical shape sized per the plans. The unit shall be made of type 316L stainless steel. The housing shall incorporate a 76 millimeter diameter cap to contain the lamp socket, a lamp access opening with continuously hinged and gasketed cover, an internally threaded 27 C national pipe thread coupling made of 318L stainless steel, and 4 mounting supports of a minimum of 3.175 millimeters thickness with appropriately sized holes for vertical mounting. Lamp access shall be achieved via a single latch and no tools shall be required for opening or closing. A closed cell silicone gasket shall form a water tight seal between the lamp access cover and the luminaire housing when latched. All luminaire assemblies shall contain, as a minimum a reflector, a lampholder, and appropriate wiring.

Reflector.--The reflector shall be polished aluminum with a reflectivity of at least 90%.

Lampholder.-- The lampholders shall be porcelain keyless mogul construction, wired with high temperature 14 Gauge wiring minimum. The sockets shall be pulse rated at 4 kV. The screw shell shall be nickel-plated brass and shall incorporate anti-vibration grips.

Tube.--The tube shall be the dual arc type.

Light refraction guide assembly.--Each Light Refraction Guide Assembly shall have 150 millimeters outside diameter, and 3.175 millimeter thickness. The length shall be per the plans. The material shall be clear impact modified acrylic. It shall contain optical elements which include prismatic optical lighting film, a less-than 15% transmission non-emitting sector, a translucent diffused and a reflective extractor. The optical elements shall be arranged such that the Light Refraction Guide Assembly emits light with a uniformity of more than min/max of 70% along the length.

An endcap shall be provided which is formed from a heat tolerant glass filled resin which is to contain an input window made from UV absorbing ceramic glass. The input endcap shall be sealed to the Light Refraction Guide Assembly housing both mechanically with stainless steel collar and with a waterproof sealant. Four holes in the input endcap shall be provided in a pattern which allows for symmetrical mounting of the light guide to the luminaire assembly.

A mirror endcap shall be provided at the opposing end to the endcap and shall be affixed with waterproof sealant.

Each Light Refraction Guide Assembly shall be supplied with 3 stainless steel, two-piece mounting brackets of a type which is suitable for the installation mechanically and aesthetically, and which shall allow for the horizontal and vertical adjustment on-site.

Photometric Compliance.--The Contractor shall demonstrate that the photometric properties of the luminaires are nearly uniform in the following manner. The minimum acceptance criteria for the test is 3:1 maximum/minimum and 2:1 average/minimum ratios.

The contractor shall provide all equipment and materials for the measurements. The Contractor shall provide typed or computer generated forms for field measurements, for calculations, and for an official summary. The materials, equipment, procedures, and forms are subject to the Engineer's approval. The measurements shall be performed in the presence of the Engineer. The location of the measurements shall be in the interior zone of the tunnel, and shall be approved by the Engineer.

The Contractor shall make and record luminance measurements at 1 meter intervals centered in each lane and centered in the traveled way, on the road surface for all measurements. All measurements shall begin at the same distance from the same tunnel entrance. There shall be 20 measurements at each location.

Following the measurements, the maximum and minimum measurements shall be highlighted on the field data sheet and transferred to a calculation sheet. The average shall be calculated by adding all of the 60 measurements and dividing by the number 60. The quotient shall be placed on the calculation sheet. The maximum/minimum ratio shall be calculated as the maximum measurement divided by the minimum measurement. The average/minimum ratio shall be calculated as the average of the 60 data points divided by the minimum measurement. All forms shall have the printed names of the persons taking the measurement or making the calculations and their signatures when completed. Forms without names and signatures shall not be accepted.

These calculations shall be transferred to an official summary sheet. The official summary sheet shall depict the acceptance criteria and the results of the field measurements. The official summary shall be signed by the Contractor or the Contractor's representative indicating that the document is authentic. The official summary and all related sheets shall be submitted to the Engineer for a permanent record and for approval.

Installation.--The installation of the luminaires shall be according to the plans, the manufacturer's instructions, and adjusted per field conditions with the Engineers approval.

Qualifying Luminaires.--The manufacturer of the luminaires shall meet the following qualifications:

- 1.. Shall have no less than 7 years experience in manufacturing tunnel lighting.
2. Shall have no less than 5 tunnels in the United States where the proposed luminaire are installed.
3. Shall have no less than 1,000 of the proposed luminaires in operation in the United States.
4. Shall provide to the engineer a list of the qualifying projects for verification.

Certificate of Compliance.-- The Contractor shall provide the Engineer with 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 of the luminaires furnished for the project.

Warranty.--The entire luminaire shall be have a complete warranty of at least 5 years.

10-3.09C PYLON LUMINAIRES

All pylon luminaires 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, ignitors, lamps, and other equipment 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.

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 with a minimum thickness of 3 mm. Door assembly shall have mechanical stops to limit gasket compression to 40% and prevent permanent distortion.
2. The reflector assembly shall consist of high purity aluminum of minimum 0.5 mm thick sheet.
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. Components and hangers required shall be steel.
5. Fasteners shall be Type 316 stainless steel.
6. Lampholders and lamp sockets shall hold lamps securely.
7. Gasketing shall be extruded hollow core EPDM. All shapes used shall be completely cover flange to which gasket is affixed.

Finish.--The luminaire housing shall be finished with a polyester powder paint be electrostatically applied and cured. The paint shall pass the B117 5% solution test.

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 minimum. The sockets shall be pulse rated at 4 kV. The screw shell shall be nickel-plated brass and shall incorporate anti-vibration grips.

Ballasts.--The ballast shall comply with Section 86.601A "High Pressure Sodium Ballast" of the Standard Specifications with the following modifications.

The ballast shall conform to the applicable requirements of UL 1029. The Ballasts shall be removable and replaced without disturbing the aiming.

Wiring.--The fixture wires shall be stranded tinned-copper construction, not smaller than No. 18 AWG. The insulation shall be rated 125° C or higher. 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 slow-blow type fuse to disconnect the luminaire from the branch circuit in case of ballast failure or other electrical problem within the luminaire.

Fixture hardware.--External screws, bolts, or other assembly and mounting parts, shall be Type 316 stainless steel.

Mechanical construction.--The conduit connection shall be National Pipe Thread type typical for conduit, and shall be sized to match the attaching conduit.

Lens assembly.--The optical assembly shall be fully enclosed and gasketed. It shall include an anodized reflector. The reflector shall have 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 4.5 mm minimum thickness minimum tempered glass.

Optical control/photometric performance.--The luminaires shall have a symmetrical photometric distribution. The Isolux curve of the luminaires shall match those in the plans.

Knuckle.--The knuckle shall be high strength die cast aluminum with an fully gasketed integral splice compartment.

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, and shall have the following characteristics:

1. 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.
2. Be capable of being used with the type of ballasts used in this project.
3. Be designed so that a cycling or extinguishing lamp shall not adversely affect the ignitor or ballast
4. Be UL listed or UL Component Recognized and CSA Certified.
5. Be warranted against defective materials and workmanship for a period of at least five years.

ranted against defective materials and workmanship for a period of at least five years.
All ignitors shall be of the same manufacturer and model number or shall have the same external dimensions and be physically and functionally interchangeable.

Fuse Block.--All luminaires shall have a fuse block installed inside the electrical section of the housing. The fuse block shall comply with Section 86.605G “Fuse Block” of the Standard Specifications with the following modifications:

1. The fuse block shall be UL listed and shall have two spaces for fuses.
2. Each terminal lug shall be large enough to accept conductors as depicted on the plans on the input side and shall be rated 600 volts.
3. The fuse block shall have fuses installed with the amperage rating as shown on the plans.

Installation.--The installation of the luminaires shall be according to the plans, the manufacturer’s instructions, and adjusted per field conditions with the Engineers approval.

Qualifying Luminaires.--The manufacturer of the luminaires shall have no less than 10 years experience in manufacturing lighting. The manufacturer of the luminaires shall have no less than 20 locations in the United States where the proposed luminaire are installed. The manufacturer of the luminaires shall have no less than 1,000 of the proposed luminaires in operation in the United States. The manufacturer of the luminaires shall provide to the engineer a list of the qualifying projects for verification.

Certificate of Compliance.-- The Contractor shall provide the Engineer with 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 of the luminaires furnished for the project.

Warranty.--The entire luminaire shall be have a complete warranty of at least 5 years.

10-3.09D LUMINAIRE LAMPS

All luminaires shall have a lamp installed. The Lamps shall comply with Section 86.601B "High Pressure Sodium Lamps" of the Standard Specifications with the following modifications:

1. The type of lamp shall be high pressure sodium with the wattage rating as shown on the plans.
2. All lamps shall be manufactured specifically for the type of luminaire selected.
3. Modification of the lamp or luminaire is prohibited.
4. All tubes shall be the single arc type except the continuous luminaires which shall be the dual arc type tube.

10-3.09E WIRING METHOD

The Contractor shall uniquely identify all phases of all channels in such a manner that each conductor may be easily identified, such as unique insulation colors or stripes. The Contractor shall submit to the Engineer for approval the method selected to uniquely identify all conductors.

10-3.09F 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 at the lighting control enclosure. The current measurements shall demonstrate that the load nearly match the loads depicted in the panel schedules.

10-3.09G LIGHTING CONTROL EQUIPMENT

The Contractor shall install any and all devices and equipment required to make the lighting circuits fully functional. 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 contactor amperage shall be rated per the plans 480V, 60 Hz, and have a control circuit voltage of 120V, 60 Hz unless otherwise shown on the plans. 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 unless otherwise shown on the plans.

All lighting contactors shall be of the same manufacturer and model number for each size.

Auxiliary Contacts.--All auxiliary contacts shall be manufactured specifically for the purpose of circuit control. The contactor amperage shall be rated 10 amperes minimum 120V, 60 Hz. They shall be manufactured specifically for attachment to the existing contactor depicted in the plans, and electrical configuration shall be as depicted in the plans.

All auxiliary contactor shall be of the same manufacturer and model number for each size.

Control Relays.--120V: All control relays shall be rated 10 amperes or more, 120V 60 Hz. They shall be the electrically or magnetically held type, and shall have contacts as shown on the plans. They shall be the general purpose plug-in type, life rating 50 million mechanical and 500,000 electrical, minimum. **480V:** All control relays shall be rated 10 amperes minimum, 480V 60 Hz. They shall be the electrically or magnetically held type, and shall have contacts as shown on the plans. They shall be the high speed protective type, average pickup time less than 16 milliseconds.

All control relays shall be of the same manufacturer and model number for each voltage rating.

Selector Switches.-- All selector switches shall be the 30.5 mm heavy duty type, rated 10 amperes 120V, 60 Hz rated for 1 million operations or more. They shall have poles and interconnections per the plans, and shall have legend plates installed and labeled per the plans. The legend plates shall be an integral part of the switch, and not a separate label.

Indicating Lights.--All indicating lights shall be the 30.5 mm heavy duty full voltage type. The lamps shall be the LED type, color per the plans. All indicating lights shall have lens installed.

All indicator lights and lamps shall be of the same manufacturer.

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 per the plans, 120V, 60 HZ, of the 55° C rise 105° C 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 fuse amperage shall be per the plans, and the secondary fuse amperage shall be per the plans - time delay type.

All lighting circuit control transformers shall be of the same manufacturer and model number, or have identical exterior dimensions.

Programmable Logic Controller System.--All lighting shall be controlled by a programmable logic controller system as described elsewhere in these Special Provisions.

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.

10-3.10 NUMBERING ELECTRICAL EQUIPMENT

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

10-3.11 MISCELLANEOUS METAL

Miscellaneous metal shall consist of clamps, clamp fasteners, support channels and fittings, threaded conduit extensions, couplings, partitions, and other metal products required to connect, separate, or fasten cable, conduit, 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 miscellaneous metal shall be considered as included in the contract lump sum prices paid for the electrical work and no additional compensation will be allowed therefor.

10-3.12 PANELBOARDS, ENCLOSED CIRCUIT BREAKER

10-3.12A PANELBOARD

All panelboards shall be of the power distribution type as described by Article 384 of the NEC. They shall be of the capacity, phase, and type shown on the plans, with adequate spaces for all circuit breakers being installed. Modifications to the panel, if required, shall comply with the plans.

The panelboards shall be mounted in the locations depicted on the plans, and adjusted per field conditions with the Engineer's approval. Attachment to the wall shall be with 6 mm diameter bolts minimum, 25 mm long minimum, and per the manufacturer's specifications.

The panelboards shall be UL listed and meet all NEMA standards for panelboards. The main lugs shall be the mechanical solderless type approved for copper conductors. The main lugs shall be secured in line according to UL standards to prevent lugs from turning or loosening when cables are installed.

All panelboard box and covers shall be NEC code gauge galvanized steel, finished for indoor use.

10-3.12A.1 Panelboards W1, W2, W3EX, E12IN and E3TH

These panelboard shall be NEMA1 indoor type, surface-mounted, factory assembled, three-phase, three-wire, 480-volt, AC panelboard shall not be over 1524 mm high and at least 508 mm wide with forty-two branch circuits included spaces. Main breaker and branch breaker ampere are shown on the plans. The short circuit rating of the assembled panel board shall not be less than 18,000 A rms. symmetrical fully rated. The panels shall be Westinghouse, Seimens, General Electric, Cutter-Hammer, or equal.

10-3.12A.2 Panelboards WU, W3IN, E2TH, and E3IN

These panelboards shall be NEMA 1 indoor type, surface-mounted, factory assembled, three-phase, three-wire, 480-volt, AC panelboard shall be at least 508 mm wide with twenty-four branch circuits included spaces. Main breaker and branch breaker ampere are shown on the plans. The short circuit rating of the assembled panel board shall not be less than 18,000 A rms. symmetrical fully rated. The panels shall be Westinghouse, Seimens, General Electric, Cutter-Hammer, or equal.

10-3.12A.3 Panelboards WPU, and UPS-EM

These panelboards shall be NEMA 1 indoor type, surface-mounted, factory assembled, three-phase, three-wire, 480-volt, AC panelboard shall be at least 508 mm wide with twelve branch circuits included spaces. Main breaker and branch

breaker ampere are shown on the plans. The short circuit rating of the assembled panel board shall not be less than 18,000 A rms. symmetrical fully rated. The panels shall be Westinghouse, Seimens, General Electric, Cutter-Hammer, or equal.

10-3.12B ENCLOSED CIRCUIT BREAKER

The lighting circuit shall be protected with an Enclosed Circuit Breaker as depicted in the plans. The Enclosed Circuit Breaker shall be enclosed in a NEMA 1 enclosure, minimum. The circuit breaker shall be of the three pole molded plastic type unless otherwise shown on the plans, and shall be amperage rated per the plans at the voltage depicted on the plans at 60 Hz. They shall have a UL listing for the interrupting rating (RMS symmetrical amperes) of 14,000 amperes.

10-3.12C Molded Case Circuit Breaker

This type of breaker is specifically applied to the existing Cutler-Hammer low voltage distribution switch boards located in both east and west side of the substation. The breaker shall have 393.7 mm (high) x 209.5 mm (width) x 139.7mm (depth) used in the frame size, shall have the male tulip used in the line and load lugs, shall have the interchangeable trip unit included. The required ampere and voltage are shown on the plans. The breaker shall be GE TKM type used in the 800 frame or equal.

10-3.13 PULL BOXES

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

10-3.14 PROTECTION OF EXISTING ELECTRICAL SYSTEMS AND FACILITIES

Protection of existing electrical systems and facilities shall consist of providing temporary support and protection for the equipment, utilities, and other facilities within the scope of this contract, and shall conform to the provision in section 7-1.11 "Preservation of Property," of the Standard Specifications.

In addition to the above requirements, the Contractor is also responsible for maintaining the integrity of the existing computer systems including software. The Contractor is required to modify the existing software as directed elsewhere in these Special Provisions, but the modifications shall in no way affect the function of the existing software or computer system.

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.

10-3.15 UNINTERRUPTIBLE POWER SUPPLY

The contractor shall supply and install an uninterruptible power supply (UPS) as described in this special provision at each location depicted on the plans. The UPS shall supply continuous, regulated AC power to HPS lighting-type loads with reliable and precise AC power under normal and abnormal conditions including but not limited to the temporary loss of utility AC power.

The UPS shall always be on-line, conditioning and regulating incoming AC power as required to keep the HPS lighting in continuous operation. It shall provide a reliable source of uninterruptible power with no fluctuations in output AC power during complete or partial interruption of the incoming power. The output of the UPS shall not be effected by the quality of the AC input.

Standards

Each UPS shall be designed in accordance with the applicable sections of the current revision of the following documents. Where a conflict arises between these documents and statements made herein, the statements in this specification shall govern.

1. ANSI C62.41 (IEEE 587).
2. FCC Part 15, Class A.
3. NEC (NFPA-70).
4. NEMA PE-1.
5. UL Standard 1778.

Rating

The UPS shall have the following continuous operation specifications:

1. The minimum kVA rating shall be per the plans with nominal 80% power factor, and HPS type loads.
2. The UPS shall carry the rated load on the batteries alone for at least 10 minutes.
3. The UPS shall be rated greater than 85% efficient for AC to AC operation, and shall be greater than 90% efficient for DC to AC operation.

4. The UPS shall be capable of normal operation with at least 125% of the rated load for 10 minutes when running on line.
5. The UPS shall be capable of normal operation with at least 110% of the rated load for 10 minutes when operating on the inverter alone.
6. The UPS shall be capable of normal operation with at least 150% of the UPS rated load for 1 minute for on-line and inverter sections.

Input

The UPS shall operate normally under the following input specifications:

1. 480 VAC +/- 10%.
2. 60 Hz +/- 5%.
3. Power Factor 80% at nominal conditions.
4. Withstand input surges per IEEE 577/ANSI C62.41.

Output

The UPS shall have the following output specifications:

1. 480 VAC +/- 1% for balanced load.
2. Regulation shall be better than +/- 1%.
3. 60 Hz +/- 0.3 Hz maximum.
4. Power factor shall be 80% to 100% lagging.
5. Total Harmonic Distortion shall be less than 5% for linear loads.
6. Phase error of less than 1%.
7. Overload capability of at least 125% for 10 minutes.

Modes

Each UPS shall be designed to operate as an on-line system in the following modes:

1. Normal: The critical AC load is continuously supplied by the UPS inverter. The rectifier/charger derives power from a utility AC source and supplies DC power to the inverter while simultaneously float-charging a power reserve battery.
2. Emergency: Upon failure of utility AC power, the critical AC load is supplied by the inverter, which without any switching, obtains power from the battery. There shall be no interruption in power to the critical load upon failure or restoration of the utility AC source.
3. Recharge: Upon restoration of utility AC power, after a utility AC power outage, the rectifier/charger shall automatically restart, walk-in, and gradually assume the inverter and battery recharge loads.
4. Bypass: If the UPS must be taken out of service for maintenance or repair, or should the inverter overload capacity be exceeded, the static transfer switch shall perform a reverse transfer of the load from the inverter to the bypass source with no interruption in power to the critical AC load.

Environmental

The UPS shall have the following environmental specifications:

1. Operating temperature between 0° C and 40° C.
2. Operating humidity from 0% to 95%, non-condensing.
3. Cooling shall be forced air.
4. Noise shall be less than 65 dB 'A' measured at 1.5 Meters.

Batteries and Battery Charger

The UPS batteries shall have the following specifications:

1. The batteries shall be sealed, maintenance-free, high-rate discharge type.
2. The expected life shall be 10 years or 200 complete full load discharge cycles.
3. Recharge time shall be less than 13 times discharge time.
4. The batteries shall be protected with a DC circuit breaker.
5. The batteries shall have a minimum capacity of 10 minutes at full load.

Controls

The UPS controls and indicators shall have the following specifications:

1. The UPS shall be microprocessor controlled.
2. The UPS shall have a front panel display, with the following minimum displays:
 - a. UPS status.
 - b. Battery Status

- c. Alarm and event queue.
- d. Active alarms.
- e. UPS configurations.
- f. Metering.
- g. Normal/Bypass mode.
- h. Utility/Battery mode.
- i. Load/Overload condition.
- j. Audio alarm control.

Protection

The UPS input shall be protected by an input current limiting circuit breaker.

The UPS input shall be protected from surges such as lightning strikes and switching surges.

The UPS output shall be protected by a current limiting circuit breaker.

Communications

The UPS shall have an EIA-232 serial asynchronous communications port for connection to a remote computer. The port shall be mounted on the exterior of the cabinet. The UPS shall send the following operations to the computer, at the request of the computer:

- 1. Alarm status and information.
- 2. Utility input data.
- 3. UPS output data.
- 4. Battery status.

Installation

The UPS and battery cabinets shall incorporate seismic anchoring methods. The UPS equipment shall be started by a customer support representative from the UPS equipment manufacturer. The UPS installation shall include all conductors, cables, connectors, conduits, and other equipment and materials as required to make the UPS fully functional. The UPS installation shall include a load test described elsewhere in these Special Provisions.

Schematics, Documentation, and Training

The Contractor shall supply detailed circuit schematics, documentation, and system drawings with the UPS. The documentation shall include wiring installation, maintenance, and troubleshooting of the battery unit. All circuit schematics, documentation, and system drawings submitted are subject to the approval of the Engineer.

The Contractor shall provide 8 hours of training not including breaks on the maintenance and operation of the UPS. The training site shall be located at the Caldecott tunnel maintenance office area and UPS location, and shall include hands on training on one UPS. The Contractor shall provide 10 training manuals for the class, however, as many as 20 may participate in the training. The class agenda and schedule shall be approved by the engineer 10 working days before the class may begin.

The Contractor shall provide the Engineer with a Certificate of Compliance from the manufacturer in accordance with the provisions of Section 6-1.07, "Certificates of Compliance," of the Standard Specifications. The Certificate of Compliance shall contain any and all of the items contained within this Special Provision.

Testing

The Contractor shall test each UPS under full load conditions, during daylight hours. The load shall be the normal HPS lighting load. The tests, methods, and criteria shall be submitted in writing to the engineer for approval 10 days before the test is to begin. The contractor shall schedule a time when the engineer shall be present for the entire test.

Test #1 The test shall include the removal of the input power for five minutes, then the re-energizing of the input power. The Contractor shall demonstrate by using the manufacturer's published information and submitted criteria, that the UPS is capable of continuing to supply power to the load for an additional 5 minutes.

If any of the HPS luminaires extinguish for any reason during the test period, then the UPS will be rejected. If the contractor cannot demonstrate that the UPS can continue to supply power to the load for an additional 5 minutes using the manufacturer's published information and accepted criteria, then the UPS will be rejected.

Test #2 The test shall include the removal of the input power for five seconds, then the re-energizing of the input power. This cycle shall be repeated 10 times at various intervals, and the entire test completed within 10 minutes of the completion of test #1.

If any of the HPS luminaires extinguish for any reason during the test period, then the UPS will be rejected.

Warranty and Service

The Contractor shall guarantee the UPS unit to be defect-free in materials and workmanship for 12 months after the project is accepted. The UPS manufacturer shall guarantee the UPS batteries for a minimum of 5 years (full replacement, transportation and labor) and an additional 5 years of pro-rated warranty by the battery manufacturer. The total warranty shall be 10 years or longer, and shall begin following the acceptance of the project.

The manufacturer shall have an established network of service centers capable of servicing the UPS. The service personnel shall be on call 24 hours a day, 365 days a year. Personnel shall be factory trained and certified in the maintenance and repair of the equipment.

Payment for the UPS and any and all associated work shall be included with the lump sum value of the UPS for each installed location.

10-3.16 EXTERNAL MAINTENANCE BYPASS SWITCH

The external maintenance bypass switch shall supply the load from the bypass source while the UPS is isolated for maintenance, shall be a wall mounted or free standing NEMA 1 enclosure that complements the appearance of the UPS, and shall provide fuses for UPS input and UPS output overcurrent protection. A cam operated, make-before-break transfer switch shall have UPS and bypass position, and a separate cam operated switch house in the same cabinet shall disconnect AC from the UPS input.

The maintenance bypass switch shall be fully rated, and is available from the UPS manufacturer. The contractor shall install the maintenance bypass switch as shown on the plans and as recommended by the manufacturer. The contractor shall not be exempted from finishing an external maintenance bypass even if the UPS has provision for an internal maintenance bypass.

Full compensation for all external maintenance bypass switch equipment, devices, programming, testing, documentation, and any and all other work directly associated with the external maintenance bypass switch shall be considered as included in the contract lump sum prices paid for the external maintenance bypass switch system for each of the locations installed and no additional compensation will be allowed therefor.

10-3.17 WIREWAYS, CHANNEL STRUT, STEEL THREADED RODS, BRACKETS, AND WING SHAPE FITTING

A. WIREWAYS

The wireways shall meet NEMA 1 requirements and be UL listed. The 200mm and 300 mm wireways shall be fabricated from 14 gauge steel, shall have an open side for lay-in of wiring with screw cover, and shall allow for concentric knockouts capable of handling conduits up to 53C..

All wireways shall have ANSI 61 gray enamel finish inside and out;

Wireways shall be grounded according to the provision of the NEC article 250 and installed according to the provision of NEC article 362.

B. CHANNEL STRUTS

The channel strut shall be a 12 gauge hot-dipped galvanized rigid steel strut. The strut shall be coated with zinc after being roll-formed or after all manufacturing operations are completed, conforming to ASTM specification NO.A123 or A 153.

C. STEEL THREADED RODS

The steel threaded rods shall be 41 mm width series channel type. The load carrying capacity of the threaded hot rolled steel shall conform to ASTM 575 and A576.

D. BRACKETS

The brackets shall be a 12gauge hot dipped galvanized rigid steel bracket. The bracket shall be coated with zinc after being roll-formed or after manufacturing operations are completed, conforming to ASTM specification NO. A123 or A 153.

E. WING SHAPE FITTING

Fittings shall be made from hot rolled, pickled, oiled, and electro-galvanized steel plate, strip or coil and conform to ASTM specifications. The fitting steel also meets the physical requirements of ASTM A570 GR33.

10-3.18 METAL JUNCTION BOXES

Metal junction boxes shall be UL listed for indoor or out door use as applicable, shall also meet NEC article 370 requirements. Junction boxes shall be fabricated from 16 gauge sheet metal and hot-dip galvanized after fabrication.

If used indoors, junction boxes shall meet NEMA type 1 enclosure requirements, have flat removable covers fastened with stainless steel screws, and have gray enamel finish.

If used outdoors junction boxes shall meet NEMA type 4 enclosure requirements, have coated ANSI 61 gray polyester powder finish inside and out over phosphatized surfaces. Doors are secured to the body with a heavy-duty continuous hinge on one side and easy -to-release stainless steel door clamps mounted to other three sides, and the door has a fixed, oil and water-resistant gasket.

10-3.19 SCADA SYSTEM

Existing Supervisory Control and Data Acquisition (SCADA) system, microwave system, Carbon Monoxide (CO) and Nitric Oxide (NO) sensors, motor starters and cabinets are conformed to the applicable provision in Section in 86, signals, Lighting and Electrical Systems," of the Standard Specifications. Existing SCADA system consists of hardware and software, fan control system, power distribution system, closed circuit television system and pop-up control system. The Contractor shall be responsible for compatibility of new tunnel lighting control system on the existing systems.

SCADA system shall have a distinctive graphic representation page on the computer screen providing a real time statuses of the elements connected to the systems. It shall provide the operator the ability manually control each device shown on the plans using a mouse. Such access shall be password protected.

the graphic presentation shall be color coded to provide a distinction between ON or OFF status. Alarm status, historical information and other notations for each status change shall be displayed, and recorded on hard disk.

Wiring diagrams shown on the plans for input and output modules are diagrammatic only. External network necessary to counteract induced signals on the conductors for proper operation of the input or output modules as recommended by the manufacturer is not shown. The Contractor shall be responsible for including such devices on the circuits as the field conditions dictates.

During the construction, all existing fans in the tunnels shall be maintained in operational mode except during off-peak traffic hours at which time on fan per tunnel can be turned off for modification. The details of off peak traffic hour shall match with the lane closure charts. The operation the existing 12KV switch gears and emergency telephone and fire alarm system shall not be affected by the construction work. If the schedule of the Contractor should require interruption of the existing power distribution system, fan control system for an overnight period, manual operation of all the above system shall be conducted with a duty electrician.

As the work progresses, the Contractor shall maintain a record of all deviations in the work from the shown on the plans. Final locations of all underground work shall be recorded by depth from finished grade and by offset distance from permanent surface structures (i.e. buildings, curbs, walks, etc). Under floor conduits and other features within the building shall be recorded by off set distance from building walls.

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

SCADA SYSTEM HARDWARE AND SOFTWARE

A. The existing SCADA system does not require hardware. However, if an additional piece of hardware is necessary, it shall be on Contractor's own cost.

Existing hardware- Master PC, HP Vectra, VL81 PIII, 450MHZ, 128MB RAM, 8.4GB Hard drive, Key board, CD ROM, 2 modems, Modicon network card.

B. The existing interface software-Wonderware Factory Suite 2000 Ver. 7, Runtime upgrade: (2). Wonderware Factory suite 2000 Ver. 7, Development upgrade:(1)

C. Microsoft Office 97, MS Visual Basic, and MS NT 4.0

SCADA GENERAL FUNCTIONS

The exact locations , arrangements, and dimensions of the device symbols, messages, display screen controls and other items on the display screens along with the drawings of the display screens shall be submitted by the Contractor to Engineer for approval. The SCADA menu shall be mouse driven with the following major functions.

A. Password Screen to enter User ID and password.

B. Overview Screen showing graphically the system's current status using color coded symbols, icons and figures, including:

1. luminance meter sensor values.
2. lighting controller mode of operations (Run, Test, Program)
3. Lighting contactor panel status (Manual, Auto)
4. Lighting output level and feedback from lighting contactors
5. alarm summary window showing latest alarms
6. Pop up menu symbols to allow for complete level override.
7. An arrow indicating the traffic direction entrances and exits of at each tunnel display

C. Alarm Handler/event log screen using color-coded text messages with a date/time stamp, status, priority, description, tag name and value. Alarms shall be latched and logged to disk in a daily alarm file and store detail information along with data, such as tunnel name, portal building, device name and number, date and time. Alarms shall be displayed on the SCADA monitor for a day. Alarms can be retrieved from the SCADA PC's hard disk drive. A distinct alarm sound shall allow operator to distinguish to the existing alarm sounds. The Alarm Handler/Event log shall show a minimum of the following;

1. Alarm summary, segregated by priority.
2. Event log, showing output status and contactor feedback.
3. Alarm history showing by date and timestamp, an event sequence and locations
4. Alarm state with unacknowledged, acknowledged and return to normal separately colored messages.

D. Trend Graph screen showing instantaneous values of the luminance meter sensor, along with controller output response. Each controller output level shall be color-coded. The trend graph shall have a minimum resolution of 1 minute. The timebase of the trend graph shall be selectable,

E. Equipment Status screen shows the front panel view of each lighting contactor cabinet. Remote override of individual lighting contactors shall be accomplished when the local panels Manual/Auto selector switch position is in the AUTO position. Indicator light symbols shall show the status of lighting contactors.

F. Report Screen allowing the operator to select between pre-configured reports that are event based (alarm reports), time based (period and accumulated runtime hours) and operator based (operator log). Each operator interface screen shall also be capable of printing to the system printer. The SCADA shall allow the user to edit, print view, delete and create reports and have Pop-up when an alarm is acknowledged

G. Scheduler program for counterblow traffic (Bore 2 only) programming lighting control changes and report schedules and provide the manual override .

H. Lighting controller programming screens to provide equipment mode and control settings, and individual light level setpoint and timing parameter.

GENERAL LIGHTING SOFTWARE REQUIREMENTS

The tunnel geometric and lighting descriptions within this portion of the Special Provisions are consistent with RP-22 (latest revision) of the Illumination Engineering Society of North America.

This portion of the Special Provisions describe the general requirements for the software as far as controlling the tunnel and approach lighting is concerned. Where programming requirements described elsewhere in these Special Provisions conflict with portions of this section, this section shall have control and precedence. The Engineer shall have the final say whether a conflict exists.

Existing Lighting West Portal

There exists historic, approach, and architectural lighting which is controlled by the existing lighting control system. Any and all of these systems shall be placed on the proposed system, and controlled by the programming. These systems energize when ambient illumination is low such as dusk and at night. The programming shall emulate the existing control scheme.

Existing Lighting East Portal

There exists historic, approach, and architectural lighting which is controlled by the existing lighting control system. Any and all of these systems shall be placed on the proposed system, and controlled by the programming. These systems energize when ambient illumination is low such as dusk and at night. The programming shall emulate the existing control scheme.

Proposed Bore #1 West Portal

Approach lighting: Circuits include lighting for the south side only. These lights are tied into the tunnel lighting, and shall be controlled through the interior zone programming.

Threshold and Transition zones: Circuits include 1A, 1B, 1C, and 1D; north and south sides, 8 circuits total. North and south circuits are mirrored throughout the tunnel. The programming shall control all of these circuits. The programming shall energize the circuits depending upon the ambient lighting conditions outside the tunnel at levels depicted in the plans. The order of energizing shall be 1A, 1B, 1C, then 1D. De-energizing shall be the reverse of energizing.

Interior Zone: Circuits include 1X, 1Y, and 1Z; north and south sides, 6 circuits total. North and south circuits are mirrored throughout the tunnel. The programming shall control all of these circuits. The order of energizing shall be determined by the programming, and shall be adjusted to keep all 3 circuits of each side energized approximately the same

amount of total energized time. At no time shall all 3 circuits of either side be de-energized at the same time except for maintenance purposes, and then only when manually set. Five conditions exist of which the programming shall comply:

- 1) Day light conditions
 - a) All 3 circuits of each side shall be energized
 - b) 1 of the 3 circuits of each side shall be energized by the UPS on a rotation schedule
 - c) Each day a different circuit of each side shall be energized by the UPS on a rotation schedule
- 2) Night Light Conditions
 - a) Only 1 circuit of each side shall be energized
 - b) The circuit shall be energized only through the UPS (see failure conditions for exceptions)
 - c) Each day a different circuit on each side shall be energized by the UPS on a rotation schedule
- 3) Transition Lighting Conditions
 - a) The circuits shall be energized according to the state diagram depicted in the plans
- 4) Failure
 - a) In the event of a UPS failure, the programming shall energize 1 circuit of each side using normal power, and send an alarm to the SCADA system. The programming shall control the lighting using the control schemes outlined in this portion of the Special Provisions with the exception the UPS powered sections, which shall be normal power instead. The programming shall remain in this state until the alarm condition is corrected, the alarm is shut off (through the SCADA system), and the programming determines that the UPS is operating normally
- 5) Maintenance
 - a) Maintenance shall have the capability to energize and de-energize circuits at the PLC control panel
 - b) Maintenance shall have the capability of energizing circuits at the GUI interface, and de-energize circuits at the GUI interface when the traffic barrier is up (only)

Proposed Bore #2 West Portal

Approach lighting: Circuits include lighting for the north side only. These lights are tied into the tunnel lighting, and shall be controlled through the interior zone programming.

Threshold and Transition zones: Circuits include 2A, 2B, 2C, and 2D; north and south sides, 8 circuits total. North and south circuits are mirrored throughout the tunnel. The programming shall control all of these circuits. The programming shall energize the circuits depending upon the ambient lighting conditions outside the tunnel at levels depicted in the plans. The order of energizing shall be 2A, 2B, 2C, then 2D. De-energizing shall be the reverse of energizing.

Interior Zone: Circuits include 2X, 2Y, and 2Z; north and south sides, 6 circuits total. North and south circuits are mirrored throughout the tunnel. The programming shall control all of these circuits. The order of energizing shall be determined by the programming, and shall be adjusted to keep all 3 circuits of each side energized approximately the same amount of total energized time. At no time shall all 3 circuits of either side be de-energized at the same time except for maintenance purposes, and then only when manually set. Five conditions exist of which the programming shall comply:

- 1) Day light conditions
 - a) All 3 circuits of each side shall be energized
 - b) 1 of the 3 circuits of each side shall be energized by the UPS on a rotation schedule
 - c) Each day a different circuit of each side shall be energized by the UPS on a rotation schedule
- 2) Night Light Conditions
 - a) Only 1 circuit of each side shall be energized
 - b) The circuit shall be energized only through the UPS (see failure conditions for exceptions)
 - c) Each day a different circuit on each side shall be energized by the UPS on a rotation schedule
- 3) Transition Lighting Conditions
 - a) The circuits shall be energized according to the state diagram depicted in the plans
- 4) Failure
 - a) In the event of a UPS failure, the programming shall energize 1 circuit of each side using normal power, and send an alarm to the SCADA system. The programming shall control the lighting using the control schemes outlined in this portion of the Special Provisions with the exception the UPS powered sections, which shall be normal power instead. The programming shall remain in this state until the alarm condition is corrected, the alarm is shut off (through the SCADA system), and the programming determines that the UPS is operating normally
- 5) Maintenance
 - a) Maintenance shall have the capability to energize and de-energize circuits at the PLC control panel
 - b) Maintenance shall have the capability of energizing circuits at the GUI interface, and de-energize circuits at the GUI interface when the traffic barrier is up (only)

Proposed Bore #3 West Portal

Exit Zones: Circuits include 3A, 3B, 3C, 3D, 3E, and 3F; north and south sides, 12 circuits total. North and south circuits are mirrored throughout the tunnel. The programming shall control all of these circuits. The programming shall energize the circuits depending upon the ambient lighting conditions outside the tunnel at levels depicted in the plans. The order of energizing shall be 3A, 3B, 3C, 3D, 3E, and 3F. De-energizing shall be the reverse of energizing.

Interior Zone: Circuits include 3X, 3Y, and 3Z; north and south sides, 6 circuits total. North and south circuits are mirrored throughout the tunnel. The programming shall control these circuits by making use of a 120V control voltage applied to the luminaire control circuit per the plans. At no time shall all 3 circuits of either side be de-energized at the same time except for maintenance purposes, and then only when manually set. Five conditions exist of which the programming shall comply:

- 1) Day light conditions
 - a) All 3 circuits of each side shall be energized by the UPS on a rotation schedule
- 2) Night Light Conditions
 - a) All 3 circuits of each side shall be energized by the UPS on a rotation schedule
 - b) Dimming shall be accomplished by energizing a 120 volt control voltage
- 3) Transition Lighting Conditions
 - a) The programming shall energize the circuits depending upon the ambient lighting conditions outside the tunnel at levels depicted in the plans. The order of energizing shall be 3A, 3B, 3C, 3D, 3E, and 3F. De-energizing shall be the reverse of energizing.
- 4) Failure
 - a) In the event of a UPS failure, the programming shall energize all circuits using normal power, and send an alarm to the SCADA system. The programming shall control the lighting using the control schemes outlined in this portion of the Special Provisions with the exception the UPS powered sections, which shall be normal power instead. The programming shall remain in this state until the alarm condition is corrected, the alarm is shut off (through the SCADA system), and the programming determines that the UPS is operating normally
- 5) Maintenance
 - a) Maintenance shall have the capability to energize and de-energize circuits at the PLC control panel
 - b) Maintenance shall have the capability of energizing circuits at the GUI interface, and de-energize circuits at the GUI interface when the traffic barrier is up (only)

Proposed Bore #1 East Portal

Approach lighting: Circuits include lighting for the south side only. These lights are tied into the tunnel lighting, and shall be controlled through the interior zone programming.

Interior Zone: Circuits include 4X, 4Y, and 4Z; north and south sides, 6 circuits total. North and south circuits are mirrored throughout the tunnel. The programming shall control all of these circuits. The order of energizing shall be determined by the programming, and shall be adjusted to keep all 3 circuits of each side energized approximately the same amount of total energized time. At no time shall all 3 circuits of either side be de-energized at the same time except for maintenance purposes, and then only when manually set. Five conditions exist of which the programming shall comply:

- 1) Day light conditions
 - a) All 3 circuits of each side shall be energized
 - b) 1 of the 3 circuits of each side shall be energized by the UPS on a rotation schedule
 - c) Each day a different circuit of each side shall be energized by the UPS on a rotation schedule
- 2) Night Light Conditions
 - a) Only 1 circuit of each side shall be energized
 - b) The circuit shall be energized only through the UPS (see failure conditions for exceptions)
 - c) Each day a different circuit on each side shall be energized by the UPS on a rotation schedule
- 3) Transition Lighting Conditions
 - a) The circuits shall be energized according to the state diagram depicted in the plans
- 4) Failure
 - a) In the event of a UPS failure, the programming shall energize 1 circuit of each side using normal power, and send an alarm to the SCADA system. The programming shall control the lighting using the control schemes outlined in this portion of the Special Provisions with the exception the UPS powered sections, which shall be normal power instead. The programming shall remain in this state until the alarm condition is corrected, the alarm is shut off (through the SCADA system), and the programming determines that the UPS is operating normally
- 5) Maintenance
 - a) Maintenance shall have the capability to energize and de-energize circuits at the PLC control panel
 - b) Maintenance shall have the capability of energizing circuits at the GUI interface, and de-energize circuits at the GUI interface when the traffic barrier is up (only)

Proposed Bore #2 East Portal

Approach lighting: Circuits include lighting for the north side only. These lights are tied into the tunnel lighting, and shall be controlled through the interior zone programming.

Threshold and Transition zones: Circuits include 5A, 5B, 5C, and 5D; north and south sides, 8 circuits total. North and south circuits are mirrored throughout the tunnel. The programming shall control all of these circuits. The programming shall energize the circuits depending upon the ambient lighting conditions outside the tunnel at levels depicted in the plans. The order of energizing shall be 5A, 5B, 5C, then 5D. De-energizing shall be the reverse of energizing.

Interior Zone: Circuits include 2X, 2Y, and 2Z; north and south sides, 6 circuits total. North and south circuits are mirrored throughout the tunnel. The programming shall control all of these circuits. The order of energizing shall be determined by the programming, and shall be adjusted to keep all 3 circuits of each side energized approximately the same amount of total energized time. At no time shall all 3 circuits of either side be de-energized at the same time except for maintenance purposes, and then only when manually set. Five conditions exist of which the programming shall comply:

- 1) Day light conditions
 - a) All 3 circuits of each side shall be energized
 - b) 1 of the 3 circuits of each side shall be energized by the UPS on a rotation schedule
 - c) Each day a different circuit of each side shall be energized by the UPS on a rotation schedule
- 2) Night Light Conditions
 - a) Only 1 circuit of each side shall be energized
 - b) The circuit shall be energized only through the UPS (see failure conditions for exceptions)
 - c) Each day a different circuit on each side shall be energized by the UPS on a rotation schedule
- 3) Transition Lighting Conditions
 - a) The circuits shall be energized according to the state diagram depicted in the plans
- 4) Failure
 - a) In the event of a UPS failure, the programming shall energize 1 circuit of each side using normal power, and send an alarm to the SCADA system. The programming shall control the lighting using the control schemes outlined in this portion of the Special Provisions with the exception the UPS powered sections, which shall be normal power instead. The programming shall remain in this state until the alarm condition is corrected, the alarm is shut off (through the SCADA system), and the programming determines that the UPS is operating normally
- 5) Maintenance
 - a) Maintenance shall have the capability to energize and de-energize circuits at the PLC control panel
 - b) Maintenance shall have the capability of energizing circuits at the GUI interface, and de-energize circuits at the GUI interface when the traffic barrier is up (only)

Proposed Bore #3 West Portal

Threshold and Transition Zones: Circuits include 6A, 6B, 6C, 6D, 6E, and 6F; north and south sides, 12 circuits total. North and south circuits are mirrored throughout the tunnel. The programming shall control all of these circuits. The programming shall energize the circuits depending upon the ambient lighting conditions outside the tunnel at levels depicted in the plans. The order of energizing shall be 6A, 6B, 6C, 6D, 6E, and 6F. De-energizing shall be the reverse of energizing.

Interior Zone: Circuits include 6X, 6Y, and 6Z; north and south sides, 6 circuits total. North and south circuits are mirrored throughout the tunnel. The programming shall control these circuits by making use of a 120V control voltage applied to the luminaire control circuit per the plans. The order of energizing shall be determined by the programming. At no time shall all 3 circuits of either side be de-energized at the same time except for maintenance purposes, and then only when manually set. Five conditions exist of which the programming shall comply:

- 1) Day light conditions
 - a) All 3 circuits of each side shall be energized by the UPS on a rotation schedule
- 2) Night Light Conditions
 - a) All 3 circuits of each side shall be energized by the UPS on a rotation schedule
 - b) Dimming shall be accomplished by energizing a 120 volt control voltage
- 3) Transition Lighting Conditions
 - a) The programming shall energize the circuits depending upon the ambient lighting conditions outside the tunnel at levels depicted in the plans. The order of energizing shall be 3A, 3B, 3C, 3D, 3E, and 3F. De-energizing shall be the reverse of energizing.
- 4) Failure
 - a) In the event of a UPS failure, the programming shall energize all circuits using normal power, and send an alarm to the SCADA system. The programming shall control the lighting using the control schemes outlined in this portion of the Special Provisions with the exception the UPS powered sections, which shall be normal power instead. The programming shall remain in this state until the alarm condition is corrected, the alarm is shut off (through the SCADA system), and the programming determines that the UPS is operating normally
- 5) Maintenance
 - a) Maintenance shall have the capability to energize and de-energize circuits at the PLC control panel
 - b) Maintenance shall have the capability of energizing circuits at the GUI interface, and de-energize circuits at the GUI interface when the traffic barrier is up (only)

Full compensation for all General Lighting Software Requirements shall be considered as included in the contract lump sum prices paid for the SCADA System and no additional compensation will be allowed therefor.

SOFTWARE MAINTENANCE

The lighting control system and SCADA system software shall be maintained for the SCADA PC. Master program databases and development editors shall be provided, as well as runtime executable programs. Password protection of the source code shall be maintained for the duration of the warranty period.

PROGRAMMABLE LOGIC CONTROLLER (PLCs)

The existing PLCs are Modicon TSX Quantum in place. The provided PLC's hardware shall be in the same series as existing that specified in plans. The existing software is Modicon Concept Windows 98/NT. The existing PLCs connected to the existing tunnel SCADA system using Modbus+ communication protocol. The Contractor shall submit the wiring diagrams for each I/O point for approval.

In the event of a power outage, one selected night lighting circuits will be remained on by UPS. The programming of the PLC shall comply with the state diagrams in the plans.

LUMINANCE SENSOR

The luminance sensor shall contain an eye-corrected silicon cell to measure the luminance in a 20° conical field from 2 to 10,000 cd/m² with a resolution of 2 cd/m². The lighting controller shall be capable of adjusting the six lighting level operating points from 2 to 10,000 cd/m² in steps of 2 cd/m². The operating mode for each level shall be selectable for use as night approach/facade lighting or day contrast lighting control. Time delays for turn off/on for each level shall be selectable in 1-minute steps from 2-30 minutes. Each level shall have separate of and on setpoints that form a deadband. A hold on timer shall provide a minimum operating time for the control output, regardless of any changes in the illuminations level. The hold on time shall be adjustable from 2-240 minutes. The lighting parameters shall be pre-programmed and stored in active RAM, battery backed RAM, and non-volatile EEPROM - for the original commissioning settings. The output switching relays shall be a minimum of 4 Amps at 250VAC. Input voltage shall be 120VAC. The components for the luminance sensor/Lighting level shall include the following:

A. A hand held interface/programmer shall be provided to display and change program parameters. Adjustments shall be made by means of keypad. The current status of the system shall be displayed showing the luminance level and the output response. The keypad display shall allow for each level's mode of operation to be selected between manual on/off override or automatic control. Programming adjustments can only be made to a level's parameters when its output has been placed in a manual mode.

B. Surge protection shall be provided at the voltage inputs of the luminance sensor. Circuit breakers shall isolate control circuits from the luminance sensor. Contractor shall provide DC power supply if for luminance sensor if it is required.

C. The housing for the luminance sensor shall be sealed to a tightness equal to IP55 per IEC publication 529 and NAME 4X. The lens shall be tempered. The mounting bracket shall be a painted steel bracket arm, which shall allow for the aiming of the luminance sensor in at least 90° angles rotation.

D. The sensor transmitter shall be capable of providing a luminance measurement 200meters without signal loss. In the event of a failure of a luminance sensor, the opposite portal luminance meter shall be used as a backup manual transfer from the SCADA workstation

E. All exterior mounting hardware shall be stainless steel. Access shall be by means of continuous hinge, with a one-piece compressible neoprene gasket.

WARRANTY

The system shall be warranted for a period of two years after commissioning. During this period, owner maintenance personnel and Contractor will be assisted by the control system manufacturer to diagnose and remedy system problems via telephone modem and dialup remote control. The manufacturer will replace spare parts that are used to effect repairs during the warranty period

COMMISSIONING

The Engineer shall review complete system test procedures for lighting control hardware, fiber optic and wire communication. Lighting controller sequence software and SCADA operator interface design test forms shall be approved before commissioning. SCADA database and representative operator screens and reports shall be approved.

Automatic script procedures shall be utilized to test lighting control hardware and software elements, log system response and generate commissioning reports.

TRAINING

Three training courses shall be developed and shall be given to State personnel by the Contractor. First training course shall be on the theory and operation of all systems. It will be designed for Engineer and supervisory personnel. It will be a one day, approximately eight hours, hands-on training on the use of the computer. It will include setting of point values on PLCs, and parameters on the SCADA system as permitted by the various security levels of the system. Six Engineer and managers will attend this course. Each attendee will be given a copy of the approved Operation Manual. The second and third training will be a day each. Six employees will attend the each training for dispatchers, maintenance and operation personnel. The course will include training on how to obtain data from the computer, how to respond to alarms, the use of SCADA system to monitor and control all the devices, step by step review and demonstrations of the maintenance required by the manufacturer of the major components of all systems. In addition the training will include testing to identify and locate failed components to the circuit board level. The Contractor shall furnish each employee one copy of the approved Operation and Maintenance Manual.

EVALUATION PERIOD OF THE PROGRAMMABLE LOGIC CONTROLLER AND MODIFIED SCADA SOFTWARE

After the new lighting is installed, tested, approved in writing by the Engineer, and training is complete, an evaluation period of 30 days shall begin. During the evaluation period, State forces will evaluate and monitor the system. During and/or at the end of the evaluation period, the Contractor shall replace any and all failed materials or devices and shall make programming modifications as directed by the Engineer and after consultation with the Manufacturer of the Programmable Logic Controller.

Programming modifications pertaining to correcting errors and various the changing of various set point values shall be considered part of this contract, and no additional compensation will be allowed. Programming modifications pertaining to work not described in the plans or Special Provisions shall be considered extra work. No extra work shall be performed without prior written approval of the Engineer, which shall include the scope of work, cost of work, and completion time of work.

If substantial failures or programming is required as determined by the Engineer, then the 30 days evaluation period shall be repeated after the repairs are complete. This process shall continue until written acceptance of the evaluation period by the Engineer.

10-3.20 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 6 millimeters unless otherwise noted.

The nameplates shall be fastened to the enclosure's exterior surface using stainless steel rivets or stainless steel screws.

Full compensation for nameplates and labels shall be considered as included in the contract lump sum prices paid for the various contract items of work and no additional compensation will be allowed therefor.

10-3.21 TEMPORARY LIGHTING

The Contractor shall provide temporary lighting in areas where the existing lighting has been removed or made nonfunctional by the Contractor. The Contractor may use existing fluorescent lights for this purpose with the Engineer's approval. The temporary lighting shall be Engineer approved, and shall be a minimum of 5 Lux throughout the construction zone. The temporary lighting maximum to minimum ratio 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.

Full compensation for the temporary lighting shall be considered as included in the contract lump sum prices paid for the various contract items of work involved and no additional compensation will be allowed therefor.

10-3.22 SEALANTS AND COMPOUNDS

Pulling Compound.--All pulls totaling more than 20 meters, involving cables larger than #1/0, or incorporating bends totaling more than 180° shall have the conduit pre lubricated before pulling.

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"

Galvanic Inhibiting Compound.--A suitable galvanic inhibiting compound shall be applied to the threads of conduits and fittings of devices which are of dissimilar metals before connections are made.

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.

Silicone and Urethane Sealant Compounds.--All Silicone and urethane sealant compounds shall comply with the following:

- 1) Be manufactured specifically for sealing against water or waterproofing
- 2) Provide a positive seal against water after curing
- 3) Cures without shrinkage
- 4) Normal use temperature from at or below -20° F to at or above +200° F
- 5) Cures at room temperature
- 6) Remain pliable after curing
- 7) Completely cure within 72 hours

Insulating Sealant.--The Contractor shall install an insulating sealant into all holes which are bored. The installation shall be between the conduit and the concrete or masonry. The insulation shall be installed per the plans. The insulation shall fill all voids within the bore which is not taken up by the conduit. The insulation compound shall be the injected foam type, and shall have an expansion ratio of at least 3:1.

Full compensation for sealants and compounds shall be considered as included in the contract lump sum prices paid for the various contract items of work involved and no additional compensation will be allowed therefor.

10-3.23 SPARES

The Contractor shall provide the following spares prior to the acceptance of the contract:

1. ten spare ballasts of the type used in the 150 W HPS fixtures
2. ten spare ballasts of the type used in the 400 W HPS fixtures
3. twenty spare lamps of the type that are used in the 150 W HPS fixtures
4. twenty spare lamps of the type that are used in the 400 W HPS fixtures
5. ten spare ignitors of the type that are used in the 150 W HPS fixtures
6. ten spare ignitors of the type that are used in the 400 W HPS fixtures
7. two spare indicator lamps of each type used
8. three spare control transformer fuses of each size used
9. ten spare luminaire fuses of each type used
10. four spare wall mounted luminaires of the 150 W HPS type
11. four spare wall mounted luminaires of the 400 W HPS type
12. four complete spare continuous luminaire fixtures

13. two spare electronic dimming modules
14. Four spare NEMA rated 3-pole AC lighting contactors used in 30 ampere rating
15. Two spare normally open auxiliary contacts used in the lighting contactor
16. Six spare slow blow fuses used in Three ampere 480-volt
17. Twelve spare slow blow fuses used in eight ampere 480-volt
18. Four spare four pole-double throw relays used in 5 ampere 120-volt

The spares shall be delivered to the Caltrans Electrical Maintenance department located at the Caldecott Tunnel (510-286-7352) following inspection and acceptance of the Engineer.

Full compensation for all spare parts, equipment, and devices shall be considered as included in the contract lump sum prices paid for the spares and no additional compensation will be allowed therefor.

10-3.24 EXISTING EQUIPMENT REMOVAL

For the purpose of these Special Provisions, the 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.

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 that are to be removed, some of which may be toxic or hazardous.

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.

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 and binding determining say as to whether the Contractor is adequately prepared, or in any disputes in this matter whatsoever.

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 salvage value for bidding purposes from this information alone.

Full compensation for work discussed in this special provision shall be considered as included in the contract lump sum price paid for existing equipment removal and no additional compensation will be allowed therefor.

10-3.25 REMOVING, REINSTALLING OR SALVAGING ELECTRICAL EQUIPMENT

Salvaged electrical materials shall be hauled to a location near the Caldecott Tunnel and stockpiled. The location shall be specified by the Engineer upon notice by the Contractor.

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

10-3.26 DISPOSING OF ELECTRICAL EQUIPMENT

Ballasts and fluorescent lamps shall be disposed of in conformance with California Department of Health Services Regulations set forth in Title 22, Division 4, Chapter 30, of the California Code of Regulations.

Ballasts that contain polychlorinated biphenyl (PCB) are designated as extremely hazardous wastes and fluorescent tubing and mercury lamps are designated as hazardous wastes under Title 22, Chapter 30, Article 9, Section 66680, of the California Code of Regulations.

When 25 or more fluorescent lamps and mercury lamps, in combination, are to be disposed of, the lamps shall be treated as recyclable hazardous waste and shall be recycled within the State of California in conformance with Title 22, Chapter 30, Article 12, of the California Code of Regulations by a currently certified recycler such as, but not limited to, the following:

- A. Exceltrans Inc., P.O. Box 866, Benicia, CA 94510, Telephone (707) 745-8907.
- B. Roberts Enterprises, 2021 South Myrtle Avenue, Monrovia, CA 91016, Telephone (818) 303-2053.

The recyclable hazardous waste shall be packaged and then shipped via a currently certified hauler in conformance with Title 22, Chapter 30, Article 12, of the California Code of Regulations and other applicable local, State, and Federal regulations.

The Engineer shall be furnished with a statement noting which certified hauler and which certified recycler is proposed for utilization, together with a copy of the recycler's interim status document or a copy of the variance letter from the Department of Health Services. The 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 disposing 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.

After removal, handling and disposing of electrical material containing polychlorinated biphenyl (PCB) will be paid for as extra work as provided in Section 4-1.03D of the Standard Specifications.

10-3.27 PAYMENT

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

The contract lump sum prices paid for the following items:

1. Bore 1 Luminaire Layout
2. Bore 2 Luminaire Layout
3. Bore 3 Luminaire Layout
4. Bore 1 and 2 Screen Luminaire Layout
5. Modify Pylon and Approach Lighting
6. Bore 1 and 2 Existing Equipment Removal
7. Bore 3 Existing Equipment Removal
8. West Portal Conduit Layout Plan
9. West Portal Bore 3 Substation Layout
10. West Portal Bore 3 Fan Room & Control Room
11. West Portal Bore 1 And 2 Electrical Plan
12. East Portal Bore 2 Substation Layout
13. East Portal Exhaust Duct Plan
14. East Portal Bore 3 Electrical Partial Plan
15. SCADA and PLCs programming
16. West portal photo sensor conduit run
17. East portal photo sensor conduit run
18. Structure's Still need to be done
19. Electrical spare parts

shall include all work as depicted on the plans. The lump sum price shall also include any and all work which is of a temporary nature, whether depicted on the plans or otherwise required to maintain all existing systems in continuous working order. The lump sum price also includes preparation and delivery of any and all proposals, plans, submittals, or other documents to the Engineer. The lump sum price also includes any and all testing, training, warranty work or modifications, software or software changes, and any other work called out in these Special Provisions.

Attention is directed to the "EVALUATION PERIOD" of these Special Provisions for special conditions relating to cost break-down and payment.

SECTION 11 (BLANK)

SECTION 12. (BLANK)

SECTION 13. (BLANK)

SECTION 14 FEDERAL REQUIREMENTS FOR FEDERAL-AID CONSTRUCTION PROJECTS

GENERAL.—The work herein proposed will be financed in whole or in part with Federal funds, and therefore all of the statutes, rules and regulations promulgated by the Federal Government and applicable to work financed in whole or in part with Federal funds will apply to such work. The "Required Contract Provisions, Federal-Aid Construction Contracts, "Form FHWA 1273, are included in this Section 14. Whenever in said required contract provisions references are made to "SHA contracting officer", "SHA resident engineer", or "authorized representative of the SHA", such references shall be construed to mean "Engineer" as defined in Section 1-1.18 of the Standard Specifications.

PERFORMANCE OF PREVIOUS CONTRACT.—In addition to the provisions in Section II, "Nondiscrimination," and Section VII, "Subletting or Assigning the Contract," of the required contract provisions, the Contractor shall comply with the following:

The bidder shall execute the CERTIFICATION WITH REGARD TO THE PERFORMANCE OF PREVIOUS CONTRACTS OR SUBCONTRACTS SUBJECT TO THE EQUAL OPPORTUNITY CLAUSE AND THE FILING OF REQUIRED REPORTS located in the proposal. No request for subletting or assigning any portion of the contract in excess of \$10,000 will be considered under the provisions of Section VII of the required contract provisions unless such request is accompanied by the CERTIFICATION referred to above, executed by the proposed subcontractor.

NON-COLLUSION PROVISION.—The provisions in this section are applicable to all contracts except contracts for Federal Aid Secondary projects.

Title 23, United States Code, Section 112, requires as a condition precedent to approval by the Federal Highway Administrator of the contract for this work that each bidder file a sworn statement executed by, or on behalf of, the person, firm, association, or corporation to whom such contract is to be awarded, certifying that such person, firm, association, or corporation has not, either directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken any action in restraint of free competitive bidding in connection with the submitted bid. A form to make the non-collusion affidavit statement required by Section 112 as a certification under penalty of perjury rather than as a sworn statement as permitted by 28, USC, Sec. 1746, is included in the proposal.

PARTICIPATION BY MINORITY BUSINESS ENTERPRISES IN SUBCONTRACTING.—Part 23, Title 49, Code of Federal Regulations applies to this Federal-aid project. Pertinent sections of said Code are incorporated in part or in its entirety within other sections of these special provisions.

Schedule B—Information for Determining Joint Venture Eligibility

(This form need not be filled in if all joint venture firms are minority owned.)

1. Name of joint venture _____
2. Address of joint venture _____
3. Phone number of joint venture _____
4. Identify the firms which comprise the joint venture. (The MBE partner must complete Schedule A.) _____

 - a. Describe the role of the MBE firm in the joint venture. _____
 - b. Describe very briefly the experience and business qualifications of each non-MBE joint venturer: _____

5. Nature of the joint venture's business _____

6. Provide a copy of the joint venture agreement.
7. What is the claimed percentage of MBE ownership? _____
8. Ownership of joint venture: (This need not be filled in if described in the joint venture agreement, provided by question 6.).
 - a. Profit and loss sharing.
 - b. Capital contributions, including equipment.
 - c. Other applicable ownership interests.

9. Control of and participation in this contract. Identify by name, race, sex, and "firm" those individuals (and their titles) who are responsible for day-to-day management and policy decision making, including, but not limited to, those with prime responsibility for:

a. Financial decisions _____

b. Management decisions, such as:

(1) Estimating _____

(2) Marketing and sales _____

(3) Hiring and firing of management personnel _____

(4) Purchasing of major items or supplies _____

c. Supervision of field operations _____

Note.—If, after filing this Schedule B and before the completion of the joint venture's work on the contract covered by this regulation, there is any significant change in the information submitted, the joint venture must inform the grantee, either directly or through the prime contractor if the joint venture is a subcontractor.

Affidavit

"The undersigned swear that the foregoing statements are correct and include all material information necessary to identify and explain the terms and operation of our joint venture and the intended participation by each joint venturer in the undertaking. Further, the undersigned covenant and agree to provide to grantee current, complete and accurate information regarding actual joint venture work and the payment therefor and any proposed changes in any of the joint venture arrangements and to permit the audit and examination of the books, records and files of the joint venture, or those of each joint venturer relevant to the joint venture, by authorized representatives of the grantee or the Federal funding agency. Any material misrepresentation will be grounds for terminating any contract which may be awarded and for initiating action under Federal or State laws concerning false statements."

_____ Name of Firm	_____ Name of Firm
_____ Signature	_____ Signature
_____ Name	_____ Name
_____ Title	_____ Title
_____ Date	_____ Date

Date _____

State of _____

County of _____

On this ____ day of _____, 19 __, before me appeared (Name) _____, to me personally known, who, being duly sworn, did execute the foregoing affidavit, and did state that he or she was properly authorized by (Name of firm) _____ to execute the affidavit and did so as his or her free act and deed.

Notary Public _____

Commission expires _____

[Seal]

Date _____

State of _____

County of _____

On this ____ day of _____, 19 __, before me appeared (Name) _____ to me personally known, who, being duly sworn, did execute the foregoing affidavit, and did state that he or she was properly authorized by (Name of firm) _____ to execute the affidavit and did so as his or her free act and deed.

Notary Public _____

Commission expires _____

[Seal]

**REQUIRED CONTRACT PROVISIONS
FEDERAL-AID CONSTRUCTION CONTRACTS**

I. GENERAL

1. These contract provisions shall apply to all work performed on the contract by the contractor's own organization and with the assistance of workers under the contractor's immediate superintendence and to all work performed on the contract by piecework, station work, or by subcontract.
2. Except as otherwise provided for in each section, the contractor shall insert in each subcontract all of the stipulations contained in these Required Contract Provisions, and further require their inclusion in any lower tier subcontract or purchase order that may in turn be made. The Required Contract Provisions shall not be incorporated by reference in any case. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with these Required Contract Provisions.
3. A breach of any of the stipulations contained in these Required Contract Provisions shall be sufficient grounds for termination of the contract.
4. A breach of the following clauses of the Required Contract Provisions may also be grounds for debarment as provided in 29 CFR 5.12:

Section I, paragraph 2;
Section IV, paragraphs 1, 2, 3, 4, and 7;
Section V, paragraphs 1 and 2a through 2g.

5. Disputes arising out of the labor standards provisions of Section IV (except paragraph 5) and Section V of these Required Contract Provisions shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the U.S. Department of Labor (DOL) as set forth in 29 CFR 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and the contracting agency, the DOL, or the contractor's employees or their representatives.
6. **Selection of Labor:** During the performance of this contract, the contractor shall not:
 - a. discriminate against labor from any other State, possession, or territory of the United States (except for employment preference for Appalachian contracts, when applicable, as specified in Attachment A), or
 - b. employ convict labor for any purpose within the limits of the project unless it is labor performed by convicts who are on parole, supervised release, or probation.

II. NONDISCRIMINATION

(Applicable to all Federal-aid construction contracts and to all related subcontracts of \$10,000 or more.)

1. **Equal Employment Opportunity:** Equal employment opportunity (EEO) requirements not to discriminate and to take affirmative action to assure equal opportunity as set forth under laws, executive orders, rules, regulations (28 CFR 35, 29 CFR 1630, and 41 CFR 60) and orders of the Secretary of Labor as modified by the provisions prescribed herein, and imposed pursuant to 23 U.S.C. 140 shall constitute the EEO and specific affirmative action standards for the contractor's project activities under this contract. The Equal Opportunity Construction Contract Specifications set forth under 41 CFR 60-4.3 and the provisions of the American Disabilities Act of 1990 (42 U.S.C. 12101 et seq.) set forth under 28 CFR 35 and 29 CFR 1630 are incorporated by reference in this contract. In the execution of this contract, the contractor agrees to comply with the following minimum specific requirement activities of EEO:
 - a. The contractor will work with the State highway agency (SHA) and the Federal Government in carrying out EEO obligations and in their review of his/her activities under the contract.
 - b. The contractor will accept as his operating policy the following statement:

"It is the policy of this Company to assure that applicants are employed, and that employees are treated during employment, without regard to their race, religion, sex, color, national origin, age or disability. Such action shall

include: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship, preapprenticeship, and/or on-the-job training."

2. **EEO Officer:** The contractor will designate and make known to the SHA contracting officers an EEO Officer who will have the responsibility for and must be capable of effectively administering and promoting an active contractor program of EEO and who must be assigned adequate authority and responsibility to do so.
3. **Dissemination of Policy:** All members of the contractor's staff who are authorized to hire, supervise, promote, and discharge employees, or who recommend such action, or who are substantially involved in such action, will be made fully cognizant of, and will implement, the contractor's EEO policy and contractual responsibilities to provide EEO in each grade and classification of employment. To ensure that the above agreement will be met, the following actions will be taken as a minimum:
 - a. Periodic meetings of supervisory and personnel office employees will be conducted before the start of work and then not less often than once every six months, at which time the contractor's EEO policy and its implementation will be reviewed and explained. The meetings will be conducted by the EEO Officer.
 - b. All new supervisory or personnel office employees will be given a thorough indoctrination by the EEO Officer, covering all major aspects of the contractor's EEO obligations within thirty days following their reporting for duty with the contractor.
 - c. All personnel who are engaged in direct recruitment for the project will be instructed by the EEO Officer in the contractor's procedures for locating and hiring minority group employees.
 - d. Notices and posters setting forth the contractor's EEO policy will be placed in areas readily accessible to employees, applicants for employment and potential employees.
 - e. The contractor's EEO policy and the procedures to implement such policy will be brought to the attention of employees by means of meetings, employee handbooks, or other appropriate means.
4. **Recruitment:** When advertising for employees, the contractor will include in all advertisements for employees the notation: "An Equal Opportunity Employer." All such advertisements will be placed in publications having a large circulation among minority groups in the area from which the project work force would normally be derived.
 - a. The contractor will, unless precluded by a valid bargaining agreement, conduct systematic and direct recruitment through public and private employee referral sources likely to yield qualified minority group applicants. To meet this requirement, the contractor will identify sources of potential minority group employees, and establish with such identified sources procedures whereby minority group applicants may be referred to the contractor for employment consideration.
 - b. In the event the contractor has a valid bargaining agreement providing for exclusive hiring hall referrals, he is expected to observe the provisions of that agreement to the extent that the system permits the contractor's compliance with EEO contract provisions. (The DOL has held that where implementation of such agreements have the effect of discriminating against minorities or women, or obligates the contractor to do the same, such implementation violates Executive Order 11246, as amended.)
 - c. The contractor will encourage his present employees to refer minority group applicants for employment. Information and procedures with regard to referring minority group applicants will be discussed with employees.
5. **Personnel Actions:** Wages, working conditions, and employee benefits shall be established and administered, and personnel actions of every type, including hiring, upgrading, promotion, transfer, demotion, layoff, and termination, shall be taken without regard to race, color, religion, sex, national origin, age or disability. The following procedures shall be followed:
 - a. The contractor will conduct periodic inspections of project sites to insure that working conditions and employee facilities do not indicate discriminatory treatment of project site personnel.

- b. The contractor will periodically evaluate the spread of wages paid within each classification to determine any evidence of discriminatory wage practices.
 - c. The contractor will periodically review selected personnel actions in depth to determine whether there is evidence of discrimination. Where evidence is found, the contractor will promptly take corrective action. If the review indicates that the discrimination may extend beyond the actions reviewed, such corrective action shall include all affected persons.
 - d. The contractor will promptly investigate all complaints of alleged discrimination made to the contractor in connection with his obligations under this contract, will attempt to resolve such complaints, and will take appropriate corrective action within a reasonable time. If the investigation indicates that the discrimination may affect persons other than the complainant, such corrective action shall include such other persons. Upon completion of each investigation, the contractor will inform every complainant of all of his avenues of appeal.
6. Training and Promotion:
- a. The contractor will assist in locating, qualifying, and increasing the skills of minority group and women employees, and applicants for employment.
 - b. Consistent with the contractor's work force requirements and as permissible under Federal and State regulations, the contractor shall make full use of training programs, i.e., apprenticeship, and on-the-job training programs for the geographical area of contract performance. Where feasible, 25 percent of apprentices or trainees in each occupation shall be in their first year of apprenticeship or training. In the event a special provision for training is provided under this contract, this subparagraph will be superseded as indicated in the special provision.
 - c. The contractor will advise employees and applicants for employment of available training programs and entrance requirements for each.
 - d. The contractor will periodically review the training and promotion potential of minority group and women employees and will encourage eligible employees to apply for such training and promotion.
7. **Unions:** If the contractor relies in whole or in part upon unions as a source of employees, the contractor will use his/her best efforts to obtain the cooperation of such unions to increase opportunities for minority groups and women within the unions, and to effect referrals by such unions of minority and female employees. Actions by the contractor either directly or through a contractor's association acting as agent will include the procedures set forth below:
- a. The contractor will use best efforts to develop, in cooperation with the unions, joint training programs aimed toward qualifying more minority group members and women for membership in the unions and increasing the skills of minority group employees and women so that they may qualify for higher paying employment.
 - b. The contractor will use best efforts to incorporate an EEO clause into each union agreement to the end that such union will be contractually bound to refer applicants without regard to their race, color, religion, sex, national origin, age or disability.
 - c. The contractor is to obtain information as to the referral practices and policies of the labor union except that to the extent such information is within the exclusive possession of the labor union and such labor union refuses to furnish such information to the contractor, the contractor shall so certify to the SHA and shall set forth what efforts have been made to obtain such information.
 - d. In the event the union is unable to provide the contractor with a reasonable flow of minority and women referrals within the time limit set forth in the collective bargaining agreement, the contractor will, through independent recruitment efforts, fill the employment vacancies without regard to race, color, religion, sex, national origin, age or disability; making full efforts to obtain qualified and/or qualifiable minority group persons and women. (The DOL has held that it shall be no excuse that the union with which the contractor has a collective bargaining agreement providing for exclusive referral failed to refer minority employees.) In the event the union referral practice prevents the contractor from meeting the obligations pursuant to Executive Order 11246, as amended, and these special provisions, such contractor shall immediately notify the SHA.

- 8. Selection of Subcontractors, Procurement of Materials and Leasing of Equipment:** The contractor shall not discriminate on the grounds of race, color, religion, sex, national origin, age or disability in the selection and retention of subcontractors, including procurement of materials and leases of equipment.
- a. The contractor shall notify all potential subcontractors and suppliers of his/her EEO obligations under this contract.
 - b. Disadvantaged business enterprises (DBE), as defined in 49 CFR 23, shall have equal opportunity to compete for and perform subcontracts which the contractor enters into pursuant to this contract. The contractor will use his best efforts to solicit bids from and to utilize DBE subcontractors or subcontractors with meaningful minority group and female representation among their employees. Contractors shall obtain lists of DBE construction firms from SHA personnel.
 - c. The contractor will use his best efforts to ensure subcontractor compliance with their EEO obligations.
- 9. Records and Reports:** The contractor shall keep such records as necessary to document compliance with the EEO requirements. Such records shall be retained for a period of three years following completion of the contract work and shall be available at reasonable times and places for inspection by authorized representatives of the SHA and the FHWA.
- a. The records kept by the contractor shall document the following:
 - (1) The number of minority and non-minority group members and women employed in each work classification on the project;
 - (2) The progress and efforts being made in cooperation with unions, when applicable, to increase employment opportunities for minorities and women;
 - (3) The progress and efforts being made in locating, hiring, training, qualifying, and upgrading minority and female employees; and
 - (4) The progress and efforts being made in securing the services of DBE subcontractors or subcontractors with meaningful minority and female representation among their employees.
 - b. The contractors will submit an annual report to the SHA each July for the duration of the project, indicating the number of minority, women, and non-minority group employees currently engaged in each work classification required by the contract work. This information is to be reported on Form FHWA-1391. If on-the-job training is being required by special provision, the contractor will be required to collect and report training data.

III. NONSEGREGATED FACILITIES

(Applicable to all Federal-aid construction contracts and to all related subcontracts of \$10,000 or more.)

- a. By submission of this bid, the execution of this contract or subcontract, or the consummation of this material supply agreement or purchase order, as appropriate, the bidder, Federal-aid construction contractor, subcontractor, material supplier, or vendor, as appropriate, certifies that the firm does not maintain or provide for its employees any segregated facilities at any of its establishments, and that the firm does not permit its employees to perform their services at any location, under its control, where segregated facilities are maintained. The firm agrees that a breach of this certification is a violation of the EEO provisions of this contract. The firm further certifies that no employee will be denied access to adequate facilities on the basis of sex or disability.
- b. As used in this certification, the term "segregated facilities" means any waiting rooms, work areas, restrooms and washrooms, restaurants and other eating areas, time clocks, locker rooms, and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees which are segregated by explicit directive, or are, in fact, segregated on the basis of race, color, religion, national origin, age or disability, because of habit, local custom, or otherwise. The only exception will be for the disabled when the demands for accessibility override (e.g. disabled parking).

- c. The contractor agrees that it has obtained or will obtain identical certification from proposed subcontractors or material suppliers prior to award of subcontracts or consummation of material supply agreements of \$10,000 or more and that it will retain such certifications in its files.

IV. PAYMENT OF PREDETERMINED MINIMUM WAGE

(Applicable to all Federal-aid construction contracts exceeding \$2,000 and to all related subcontracts, except for projects located on roadways classified as local roads or rural minor collectors, which are exempt.)

1. General:

- a. All mechanics and laborers employed or working upon the site of the work will be paid unconditionally and not less often than once a week and without subsequent deduction or rebate on any account [except such payroll deductions as are permitted by regulations (29 CFR 3)] issued by the Secretary of Labor under the Copeland Act (40 U.S.C. 276c) the full amounts of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment. The payment shall be computed at wage rates not less than those contained in the wage determination of the Secretary of Labor (hereinafter "the wage determination") which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor or its subcontractors and such laborers and mechanics. The wage determination (including any additional classifications and wage rates conformed under paragraph 2 of this Section IV and the DOL poster (WH-1321) or Form FHWA-1495) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers. For the purpose of this Section, contributions made or costs reasonably anticipated for bona fide fringe benefits under Section 1(b)(2) of the Davis-Bacon Act (40 U.S.C. 276a) on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of Section IV, paragraph 3b, hereof. Also, for the purpose of this Section, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs, which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in paragraphs 4 and 5 of this Section IV.
- b. Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein, provided, that the employer's payroll records accurately set forth the time spent in each classification in which work is performed.
- c. All rulings and interpretations of the Davis-Bacon Act and related acts contained in 29 CFR 1, 3, and 5 are herein incorporated by reference in this contract.

2. Classification:

- a. The SHA contracting officer shall require that any class of laborers or mechanics employed under the contract, which is not listed in the wage determination, shall be classified in conformance with the wage determination.
- b. The contracting officer shall approve an additional classification, wage rate and fringe benefits only when the following criteria have been met:
 - (1) the work to be performed by the additional classification requested is not performed by a classification in the wage determination;
 - (2) the additional classification is utilized in the area by the construction industry;
 - (3) the proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination; and
 - (4) with respect to helpers, when such a classification prevails in the area in which the work is performed.
- c. If the contractor or subcontractors, as appropriate, the laborers and mechanics (if known) to be employed in the additional classification or their representatives, and the contracting officer agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by the contracting officer to the DOL, Administrator of the Wage and Hour Division, Employment Standards Administration, Washington, D.C. 20210. The Wage and Hour Administrator, or an authorized

representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

- d. In the event the contractor or subcontractors, as appropriate, the laborers or mechanics to be employed in the additional classification or their representatives, and the contracting officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the contracting officer shall refer the questions, including the views of all interested parties and the recommendation of the contracting officer, to the Wage and Hour Administrator for determination. Said Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary
- e. The wage rate (including fringe benefits where appropriate) determined pursuant to paragraph 2c or 2d of this Section IV shall be paid to all workers performing work in the additional classification from the first day on which work is performed in the classification.

3. Payment of Fringe Benefits:

- a. Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor or subcontractors, as appropriate, shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly case equivalent thereof.
- b. If the contractor or subcontractor, as appropriate, does not make payments to a trustee or other third person, he/she may consider as a part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, provided, that the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

4. Apprentices and Trainees (Programs of the U.S. DOL) and Helpers:

- a. Apprentices:
 - (1) Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the DOL, Employment and Training Administration, Bureau of Apprenticeship and Training, or with a State apprenticeship agency recognized by the Bureau, or if a person is employed in his/her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Bureau of Apprenticeship and Training or a State apprenticeship agency (where appropriate) to be eligible for probationary employment as an apprentice.
 - (2) The allowable ratio of apprentices to journeyman-level employees on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any employee listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate listed in the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor or subcontractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman-level hourly rate) specified in the contractor's or subcontractor's registered program shall be observed.
 - (3) Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeyman-level hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator for the Wage and Hour Division determines that a different

practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination.

- (4) In the event the Bureau of Apprenticeship and Training, or a State apprenticeship agency recognized by the Bureau, withdraws approval of an apprenticeship program, the contractor or subcontractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the comparable work performed by regular employees until an acceptable program is approved.

b. Trainees:

- (1) Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the DOL, Employment and Training Administration.
- (2) The ratio of trainees to journeyman-level employees on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed.
- (3) Every trainee must be paid at not less than the rate specified in the approved program for his/her level of progress, expressed as a percentage of the journeyman-level hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman-level wage rate on the wage determination which provides for less than full fringe benefits for apprentices, in which case such trainees shall receive the same fringe benefits as apprentices.
- (4) In the event the Employment and Training Administration withdraws approval of a training program, the contractor or subcontractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

c. Helpers:

Helpers will be permitted to work on a project if the helper classification is specified and defined on the applicable wage determination or is approved pursuant to the conformance procedure set forth in Section IV.2. Any worker listed on a payroll at a helper wage rate, who is not a helper under an approved definition, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed.

5. Apprentices and Trainees (Programs of the U.S. DOT):

Apprentices and trainees working under apprenticeship and skill training programs which have been certified by the Secretary of Transportation as promoting EEO in connection with Federal-aid highway construction programs are not subject to the requirements of paragraph 4 of this Section IV. The straight time hourly wage rates for apprentices and trainees under such programs will be established by the particular programs. The ratio of apprentices and trainees to journeymen shall not be greater than permitted by the terms of the particular program.

6. Withholding:

The SHA shall upon its own action or upon written request of an authorized representative of the DOL withhold, or cause to be withheld, from the contractor or subcontractor under this contract or any other Federal contract with the same prime contractor, or any other Federally-assisted contract subject to Davis-Bacon prevailing wage requirements which is held by the same prime contractor, as much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work, all or

part of the wages required by the contract, the SHA contracting officer may, after written notice to the contractor, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

7. Overtime Requirements:

No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers, mechanics, watchmen, or guards (including apprentices, trainees, and helpers described in paragraphs 4 and 5 above) shall require or permit any laborer, mechanic, watchman, or guard in any workweek in which he/she is employed on such work, to work in excess of 40 hours in such workweek unless such laborer, mechanic, watchman, or guard receives compensation at a rate not less than one-and-one-half times his/her basic rate of pay for all hours worked in excess of 40 hours in such workweek.

8. Violation:

Liability for Unpaid Wages; Liquidated Damages: In the event of any violation of the clause set forth in paragraph 7 above, the contractor and any subcontractor responsible thereof shall be liable to the affected employee for his/her unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory) for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer, mechanic, watchman, or guard employed in violation of the clause set forth in paragraph 7, in the sum of \$10 for each calendar day on which such employee was required or permitted to work in excess of the standard work week of 40 hours without payment of the overtime wages required by the clause set forth in paragraph 7.

9. Withholding for Unpaid Wages and Liquidated Damages:

The SHA shall upon its own action or upon written request of any authorized representative of the DOL withhold, or cause to be withheld, from any monies payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other Federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph 8 above.

V. STATEMENTS AND PAYROLLS

(Applicable to all Federal-aid construction contracts exceeding \$2,000 and to all related subcontracts, except for projects located on roadways classified as local roads or rural collectors, which are exempt.)

1. Compliance with Copeland Regulations (29 CFR 3):

The contractor shall comply with the Copeland Regulations of the Secretary of Labor which are herein incorporated by reference.

2. Payrolls and Payroll Records:

a. Payrolls and basic records relating thereto shall be maintained by the contractor and each subcontractor during the course of the work and preserved for a period of 3 years from the date of completion of the contract for all laborers, mechanics, apprentices, trainees, watchmen, helpers, and guards working at the site of the work.

b. The payroll records shall contain the name, social security number, and address of each such employee; his or her correct classification; hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalent thereof the types described in Section 1(b)(2)(B) of the Davis Bacon Act); daily and weekly number of hours worked; deductions made; and actual wages paid. In addition, for Appalachian contracts, the payroll records shall contain a notation indicating whether the employee does, or does not, normally reside in the labor area as defined in Attachment A, paragraph 1. Whenever the Secretary of Labor, pursuant to Section IV, paragraph 3b, has found that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in Section 1(b)(2)(B) of the Davis Bacon Act, the contractor and each subcontractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, that the plan or program has been communicated in writing to the laborers or mechanics affected, and show the cost anticipated or the actual cost incurred in providing benefits. Contractors or subcontractors employing

apprentices or trainees under approved programs shall maintain written evidence of the registration of apprentices and trainees, and ratios and wage rates prescribed in the applicable programs.

- c. Each contractor and subcontractor shall furnish, each week in which any contract work is performed, to the SHA resident engineer a payroll of wages paid each of its employees (including apprentices, trainees, and helpers, described in Section IV, paragraphs 4 and 5, and watchmen and guards engaged on work during the preceding weekly payroll period). The payroll submitted shall set out accurately and completely all of the information required to be maintained under paragraph 2b of this Section V. This information may be submitted in any form desired. Optional Form WH-347 is available for this purpose and may be purchased from the Superintendent of Documents (Federal stock number 029-005-0014-1), U.S. Government Printing Office, Washington, D.C. 20402. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors.
- d. Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his/her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:
 - (1) that the payroll for the payroll period contains the information required to be maintained under paragraph 2b of this Section V and that such information is correct and complete;
 - (2) that such laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in the Regulations, 29 CFR 3;
 - (3) that each laborer or mechanic has been paid not less than the applicable wage rate and fringe benefits or cash equivalent for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.
- e. The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph 2d of this Section V.
- f. The falsification of any of the above certifications may subject the contractor to civil or criminal prosecution under 18 U.S.C. 1001 and 31 U.S.C. 231.
- g. The contractor or subcontractor shall make the records required under paragraph 2b of this Section V available for inspection, copying, or transcription by authorized representatives of the SHA, the FHWA, or the DOL, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, the SHA, the FHWA, the DOL, or all may, after written notice to the contractor, sponsor, applicant, or owner, take such actions as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

VI. RECORD OF MATERIALS, SUPPLIES, AND LABOR

1. On all Federal-aid contracts on the National Highway System, except those which provide solely for the installation of protective devices at railroad grade crossings, those which are constructed on a force account or direct labor basis, highway beautification contracts, and contracts for which the total final construction cost for roadway and bridge is less than \$1,000,000 (23 CFR 635) the contractor shall:
 - a. Become familiar with the list of specific materials and supplies contained in Form FHWA-47, "Statement of Materials and Labor Used by Contractor of Highway Construction Involving Federal Funds," prior to the commencement of work under this contract.
 - b. Maintain a record of the total cost of all materials and supplies purchased for and incorporated in the work, and also of the quantities of those specific materials and supplies listed on Form FHWA-47, and in the units shown on Form FHWA-47.

- c. Furnish, upon the completion of the contract, to the SHA resident engineer on Form FHWA-47 together with the data required in paragraph 1b relative to materials and supplies, a final labor summary of all contract work indicating the total hours worked and the total amount earned.
2. At the prime contractor's option, either a single report covering all contract work or separate reports for the contractor and for each subcontract shall be submitted.

VII. SUBLETTING OR ASSIGNING THE CONTRACT

1. The contractor shall perform with its own organization contract work amounting to not less than 30 percent (or a greater percentage if specified elsewhere in the contract) of the total original contract price, excluding any specialty items designated by the State. Specialty items may be performed by subcontract and the amount of any such specialty items performed may be deducted from the total original contract price before computing the amount of work required to be performed by the contractor's own organization (23 CFR 635).
 - a. "Its own organization" shall be construed to include only workers employed and paid directly by the prime contractor and equipment owned or rented by the prime contractor, with or without operators. Such term does not include employees or equipment of a subcontractor, assignee, or agent of the prime contractor.
 - b. "Specialty Items" shall be construed to be limited to work that requires highly specialized knowledge, abilities, or equipment not ordinarily available in the type of contracting organizations qualified and expected to bid on the contract as a whole and in general are to be limited to minor components of the overall contract.
2. The contract amount upon which the requirements set forth in paragraph 1 of Section VII is computed includes the cost of material and manufactured products which are to be purchased or produced by the contractor under the contract provisions.
3. The contractor shall furnish (a) a competent superintendent or supervisor who is employed by the firm, has full authority to direct performance of the work in accordance with the contract requirements, and is in charge of all construction operations (regardless of who performs the work) and (b) such other of its own organizational resources (supervision, management, and engineering services) as the SHA contracting officer determines is necessary to assure the performance of the contract.
4. No portion of the contract shall be sublet, assigned or otherwise disposed of except with the written consent of the SHA contracting officer, or authorized representative, and such consent when given shall not be construed to relieve the contractor of any responsibility for the fulfillment of the contract. Written consent will be given only after the SHA has assured that each subcontract is evidenced in writing and that it contains all pertinent provisions and requirements of the prime contract.

VIII. SAFETY: ACCIDENT PREVENTION

1. In the performance of this contract the contractor shall comply with all applicable Federal, State, and local laws governing safety, health, and sanitation (23 CFR 635). The contractor shall provide all safeguards, safety devices and protective equipment and take any other needed actions as it determines, or as the SHA contracting officer may determine, to be reasonably necessary to protect the life and health of employees on the job and the safety of the public and to protect property in connection with the performance of the work covered by the contract.
2. It is a condition of this contract, and shall be made a condition of each subcontract, which the contractor enters into pursuant to this contract, that the contractor and any subcontractor shall not permit any employee, in performance of the contract, to work in surroundings or under conditions which are unsanitary, hazardous or dangerous to his/her health or safety, as determined under construction safety and health standards (29 CFR 1926) promulgated by the Secretary of Labor, in accordance with Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 333).
3. Pursuant to 29 CFR 1926.3, it is a condition of this contract that the Secretary of Labor or authorized representative thereof, shall have right of entry to any site of contract performance to inspect or investigate the matter of compliance with the construction safety and health standards and to carry out the duties of the Secretary under Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 333).

IX. FALSE STATEMENTS CONCERNING HIGHWAY PROJECTS

In order to assure high quality and durable construction in conformity with approved plans and specifications and a high degree of reliability on statements and representations made by engineers, contractors, suppliers, and workers on Federal-aid highway projects, it is essential that all persons concerned with the project perform their functions as carefully, thoroughly, and honestly as possible. Willful falsification, distortion, or misrepresentation with respect to any facts related to the project is a violation of Federal law. To prevent any misunderstanding regarding the seriousness of these and similar acts, the following notice shall be posted on each Federal-aid highway project (23 CFR 635) in one or more places where it is readily available to all persons concerned with the project:

Notice To All Personnel Engaged On Federal-Aid Highway Projects

18 U.S.C. 1020 READS AS FOLLOWS:

"Whoever being an officer, agent, or employee of the United States, or any State or Territory, or whoever, whether a person, association, firm, or corporation, knowingly makes any false statement, false representation, or false report as to the character, quality, quantity, or cost of the material used or to be used, or the quantity or quality of the work performed or to be performed, or the cost thereof in connection with the submission of plans, maps, specifications, contracts, or costs of construction on any highway or related project submitted for approval to the Secretary of Transportation; or

Whoever knowingly makes any false statement, false representation, false report or false claim with respect to the character, quality, quantity, or cost of any work performed or to be performed, or materials furnished or to be furnished, in connection with the construction of any highway or related project approved by the Secretary of Transportation; or

Whoever knowingly makes any false statement or false representation as to material fact in any statement, certificate, or report submitted pursuant to provisions of the Federal-aid Roads Act approved July 1, 1916, (39 Stat. 355), as amended and supplemented;

Shall be fined not more than \$10,000 or imprisoned not more than 5 years or both."

X. IMPLEMENTATION OF CLEAN AIR ACT AND FEDERAL WATER POLLUTION CONTROL ACT

(Applicable to all Federal-aid construction contracts and to all related subcontracts of \$100,000 or more.)

By submission of this bid or the execution of this contract, or subcontract, as appropriate, the bidder, Federal-aid construction contractor, or subcontractor, as appropriate, will be deemed to have stipulated as follows:

1. That any facility that is or will be utilized in the performance of this contract, unless such contract is exempt under the Clean Air Act, as amended (42 U.S.C. 1857 et seq., as amended by Pub.L. 91-604), and under the Federal Water Pollution Control Act, as amended (33 U.S.C. 1251 et seq., as amended by Pub.L. 92-500), Executive Order 11738, and regulations in implementation thereof (40 CFR 15) is not listed, on the date of contract award, on the U.S. Environmental Protection Agency (EPA) List of Violating Facilities pursuant to 40 CFR 15.20.
2. That the firm agrees to comply and remain in compliance with all the requirements of Section 114 of the Clean Air Act and Section 308 of the Federal Water Pollution Control Act and all regulations and guidelines listed thereunder.
3. That the firm shall promptly notify the SHA of the receipt of any communication from the Director, Office of Federal Activities, EPA, indicating that a facility that is or will be utilized for the contract is under consideration to be listed on the EPA List of Violating Facilities.
4. That the firm agrees to include or cause to be included the requirements of paragraph 1 through 4 of this Section X in every nonexempt subcontract, and further agrees to take such action as the government may direct as a means of enforcing such requirements.

XI. CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION

1. Instructions for Certification - Primary Covered Transactions:

(Applicable to all Federal-aid contracts - 49 CFR 29)

- a. By signing and submitting this proposal, the prospective primary participant is providing the certification set out below.
- b. The inability of a person to provide the certification set out below will not necessarily result in denial of participation in this covered transaction. The prospective participant shall submit an explanation of why it cannot provide the certification set out below. The certification or explanation will be considered in connection with the department or agency's determination whether to enter into this transaction. However, failure of the prospective primary participant to furnish a certification or an explanation shall disqualify such a person from participation in this transaction.
- c. The certification in this clause is a material representation of fact upon which reliance was placed when the department or agency determined to enter into this transaction. If it is later determined that the prospective primary participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause of default.
- d. The prospective primary participant shall provide immediate written notice to the department or agency to whom this proposal is submitted if any time the prospective primary participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.
- e. The terms "covered transaction," "debarred," "suspended," "ineligible," "lower tier covered transaction," "participant," "person," "primary covered transaction," "principal," "proposal," and "voluntarily excluded," as used in this clause, have the meanings set out in the Definitions and Coverage sections of rules implementing Executive Order 12549. You may contact the department or agency to which this proposal is submitted for assistance in obtaining a copy of those regulations.
- f. The prospective primary participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency entering into this transaction.
- g. The prospective primary participant further agrees by submitting this proposal that it will include the clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction," provided by the department or agency entering into this covered transaction, without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions.
- h. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant may decide the method and frequency by which it determines the eligibility of its principals. Each participant may, but is not required to, check the nonprocurement portion of the "Lists of Parties Excluded From Federal Procurement or Nonprocurement Programs" (Nonprocurement List) which is compiled by the General Services Administration.
- i. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.
- j. Except for transactions authorized under paragraph f of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause or default.

Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion — Primary Covered Transactions

1. The prospective primary participant certifies to the best of its knowledge and belief, that it and its principals:

- a. Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;
 - b. Have not within a 3-year period preceding this proposal been convicted of or had a civil judgement rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;
 - c. Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph 1b of this certification; and
 - d. Have not within a 3-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default.
2. Where the prospective primary participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

2. Instructions for Certification - Lower Tier Covered Transactions:

(Applicable to all subcontracts, purchase orders and other lower tier transactions of \$25,000 or more - 49 CFR 29)

- a. By signing and submitting this proposal, the prospective lower tier is providing the certification set out below.
- b. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.
- c. The prospective lower tier participant shall provide immediate written notice to the person to which this proposal is submitted if at any time the prospective lower tier participant learns that its certification was erroneous by reason of changed circumstances.
- d. The terms "covered transaction," "debarred," "suspended," "ineligible," "primary covered transaction," "participant," "person," "principal," "proposal," and "voluntarily excluded," as used in this clause, have the meanings set out in the Definitions and Coverage sections of rules implementing Executive Order 12549. You may contact the person to which this proposal is submitted for assistance in obtaining a copy of those regulations.
- e. The prospective lower tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency with which this transaction originated.
- f. The prospective lower tier participant further agrees by submitting this proposal that it will include this clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction," without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions.
- g. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant may decide the method and frequency by which it determines the eligibility of its principals. Each participant may, but is not required to, check the Nonprocurement List.
- h. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of participant is

not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

- i. Except for transactions authorized under paragraph e of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion — Lower Tier Covered Transactions

1. The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency.
2. Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

XII. CERTIFICATION REGARDING USE OF CONTRACT FUNDS FOR LOBBYING

(Applicable to all Federal-aid construction contracts and to all related subcontracts which exceed \$100,000 - 49 CFR 20)

1. The prospective participant certifies, by signing and submitting this bid or proposal, to the best of his or her knowledge and belief, that:
 - a. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.
 - b. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.
2. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31 U.S.C. 1352. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.
3. The prospective participant also agrees by submitting his or her bid or proposal that he or she shall require that the language of this certification be included in all lower tier subcontracts, which exceed \$100,000 and that all such recipients shall certify and disclose accordingly.

FEDERAL-AID FEMALE AND MINORITY GOALS

In accordance with Section II, "Nondiscrimination," of "Required Contract Provisions Federal-aid Construction Contracts" the following are the goals for female utilization:

Goal for Women (applies nationwide).....(percent) 6.9

The following are goals for minority utilization:

CALIFORNIA ECONOMIC AREA

		Goal (Percent)
174	Redding, CA: Non-SMSA Counties CA Lassen; CA Modoc;CA Plumas;CA Shasta; CA Siskiyou; CA Tehama.	6.8
175	Eureka, CA Non-SMSA Counties CA Del Norte; CA Humboldt; CA Trinity.	6.6
176	San Francisco-Oakland-San Jose, CA: SMSA Counties: 7120 Salinas-Seaside-Monterey, CA CA Monterey. 7360 San Francisco-Oakland CA Alameda; CA Contra Costa; CA Marin; CA San Francisco; CA San Mateo. 7400 San Jose, CA CA Santa Clara. 7485 Santa Cruz, CA. CA Santa Cruz. 7500 Santa Rosa, CA CA Sonoma. 8720 Vallejo-Fairfield- Napa, CA CA Napa; CA Solano Non-SMSA Counties CA Lake; CA Mendocino; CA San Benito	28.9 25.6 19.6 14.9 9.1 17.1 23.2
177	Sacramento, CA: SMSA Counties: 6920 Sacramento, CA CA Placer; CA Sacramento; CA Yolo. Non-SMSA Counties CA Butte; CA Colusa; CA El Dorado; CA Glenn; CA Nevada; CA Sierra; CA Sutter; CA Yuba.	16.1 14.3
178	Stockton-Modesto, CA: SMSA Counties: 5170 Modesto, CA CA Stanislaus. 8120 Stockton, CA CA San Joaquin. Non-SMSA Counties CA Alpine; CA Amador; CA Calaveras; CA Mariposa;CA Merced; CA Tuolumne.	12.3 24.3 19.8

		Goal (Percent)
179	Fresno-Bakersfield, CA	
	SMSA Counties:	
	0680 Bakersfield, CA	19.1
	CA Kern.	
	2840 Fresno, CA	26.1
	CA Fresno.	
	Non-SMSA Counties	23.6
	CA Kings; CA Madera; CA Tulare.	
180	Los Angeles, CA:	
	SMSA Counties:	
	0360 Anaheim-Santa Ana-Garden Grove, CA	11.9
	CA Orange.	
	4480 Los Angeles-Long Beach, CA	28.3
	CA Los Angeles.	
	6000 Oxnard-Simi Valley-Ventura, CA	21.5
	CA Ventura.	
	6780 Riverside-San Bernardino-Ontario, CA.	19.0
	CA Riverside; CA San Bernardino.	
	7480 Santa Barbara-Santa Maria-Lompoc, CA	19.7
	CA Santa Barbara.	
	Non-SMSA Counties	24.6
	CA Inyo; CA Mono; CA San Luis Obispo.	
181	San Diego, CA:	
	SMSA Counties	
	7320 San Diego, CA.	16.9
	CA San Diego.	
	Non-SMSA Counties	18.2
	CA Imperial.	

In addition to the reporting requirements set forth elsewhere in this contract the Contractor and subcontractors holding subcontracts, not including material suppliers, of \$10,000 or more, shall submit for every month of July during which work is performed, employment data as contained under Form FHWA PR-1391 (Appendix C to 23 CFR, Part 230), and in accordance with the instructions included thereon.

FEDERAL REQUIREMENT TRAINING SPECIAL PROVISIONS

As part of the Contractor's equal employment opportunity affirmative action program, training shall be provided as follows:

The Contractor shall provide on-the-job training to develop full journeymen in the types of trades or job classification involved.

The goal for the number of trainees or apprentices to be trained under the requirements of this special provision will be 10.

In the event the Contractor subcontracts a portion of the contract work, he shall determine how many, if any, of the trainees or apprentices are to be trained by the subcontractor, provided however, that the Contractor shall retain the primary responsibility for meeting the training requirements imposed by this special provision. The Contractor shall also insure that this Training Special Provision is made applicable to such subcontract. Where feasible, 25 percent of trainees or apprentices in each occupation shall be in their first year of apprenticeship or training.

The number of trainees or apprentices shall be distributed among the work classifications on the basis of the Contractor's needs and the availability of journeymen in the various classifications within a reasonable area of recruitment. Prior to commencing work, the Contractor shall submit to the Department for approval the number of trainees or apprentices to be trained in each selected classification and training program to be used. Furthermore, the Contractor shall specify the starting time for training in each of the classifications. The Contractor will be credited for each trainee or apprentice employed by him on the contract work who is currently enrolled or becomes enrolled in an approved program and will be reimbursed for such trainees or apprentices as provided hereinafter.

Training and upgrading of minorities and women toward journeymen status is a primary objective of this Training Special Provision. Accordingly, the Contractor shall make every effort to enroll minority and women trainees or apprentices (e.g., by conducting systematic and direct recruitment through public and private sources likely to yield minority and women trainees or apprentices) to the extent such persons are available within a reasonable area of recruitment. The Contractor will be responsible for demonstrating the steps that he has taken in pursuance thereof, prior to a determination as to whether the Contractor is in compliance with this Training Special Provision. This training commitment is not intended, and shall not be used, to discriminate against any applicant for training, whether a member of a minority group or not.

No employee shall be employed as a trainee or apprentice in any classification in which he has successfully completed a training course leading to journeyman status or in which he has been employed as a journeyman. The Contractor should satisfy this requirement by including appropriate questions in the employee application or by other suitable means. Regardless of the method used the Contractor's records should document the findings in each case.

The minimum length and type of training for each classification will be as established in the training program selected by the Contractor and approved by both the Department and the Federal Highway Administration. The Department and the Federal Highway Administration will approve a program if it is reasonably calculated to meet the equal employment opportunity obligations of the Contractor and to qualify the average trainee or apprentice for journeyman status in the classification concerned by the end of the training period. Furthermore, apprenticeship programs registered with the U.S. Department of Labor, Bureau of Apprenticeship and Training, or with the State of California, Department of Industrial Relations, Division of Apprenticeship Standards recognized by the Bureau and training programs approved but not necessarily sponsored by the U.S. Department of Labor, Manpower Administration, Bureau of Apprenticeship and Training shall also be considered acceptable provided it is being administered in a manner consistent with the equal employment obligations of Federal-aid highway construction contracts. Approval or acceptance of a training program shall be obtained from the State prior to commencing work on the classification covered by the program. It is the intention of these provisions that training is to be provided in the construction crafts rather than clerk-typists or secretarial-type positions. Training is permissible in lower level management positions such as office engineers, estimators, timekeepers, etc., where the training is oriented toward construction applications. Training in the laborer classification may be permitted provided that significant and meaningful training is provided and approved by the division office. Some offsite training is permissible as long as the training is an integral part of an approved training program and does not comprise a significant part of the overall training.

Except as otherwise noted below, the Contractor will be reimbursed 80 cents per hour of training given an employee on this contract in accordance with an approved training program. As approved by the Engineer, reimbursement will be made for training of persons in excess of the number specified herein. This reimbursement will be made even though the Contractor receives additional training program funds from other sources, provided such other source does not specifically prohibit the Contractor from receiving other reimbursement. Reimbursement for offsite training indicated above may only be made to the Contractor where he does one or more of the following and the trainees or apprentices are concurrently employed on a Federal-aid project; contributes to the cost of the training, provides the instruction to the trainee or apprentice or pays the trainee's or apprentice's wages during the offsite training period.

No payment shall be made to the Contractor if either the failure to provide the required training, or the failure to hire the trainee or apprentice as a journeyman, is caused by the Contractor and evidences a lack of good faith on the part of the Contractor in meeting the requirements of this Training Special Provision. It is normally expected that a trainee or apprentice

will begin his training on the project as soon as feasible after start of work utilizing the skill involved and remain on the project as long as training opportunities exist in his work classification or until he has completed his training program. It is not required that all trainees or apprentices be on board for the entire length of the contract. A Contractor will have fulfilled his responsibilities under this Training Special Provision if he has provided acceptable training to the number of trainees or apprentices specified. The number trained shall be determined on the basis of the total number enrolled on the contract for a significant period.

Only trainees or apprentices registered in a program approved by the State of California's State Administrator of Apprenticeship may be employed on the project and said trainees or apprentices shall be paid the standard wage specified under the regulations of the craft or trade at which they are employed.

The Contractor shall furnish the trainee or apprentice a copy of the program he will follow in providing the training. The Contractor shall provide each trainee or apprentice with a certification showing the type and length of training satisfactorily completed.

The Contractor will provide for the maintenance of records and furnish periodic reports documenting his performance under this Training Special Provision.