**** WARNING ** WARNING ** WARNING ** WARNING ****
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STATE OF CALIFORNIA

DEPARTMENT OF TRANSPORTATION

NOTICE TO CONTRACTORS

AND

SPECIAL PROVISIONS

FOR CONSTRUCTION ON STATE HIGHWAY IN

AMADOR COUNTY IN AND NEAR SUTTER CREEK AND AMADOR CITY FROM JUNCTION ROUTE 104 TO 0.3 KM SOUTH OF RANCHERIA CREEK BRIDGE

DISTRICT 10, ROUTE 49

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

CONTRACT NO. 10-049944

10-Ama-49-11.2/R17.7

Federal Aid Project

ACSTP-P049(129)E

Bids Open: November 5, 2003
Dated: September 22, 2003

OSD

****

IMPORTANT SPECIAL NOTICES

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- Effective September 2, 2003, Triaxial Management Services will no longer provide lists of certified DBEs to contractors bidding on projects or provide DBEs with assistance in preparing bids for subcontracting or supplying materials. Triaxial provided these services for contracts in Districts 01, 02, 03, 04, 05 (except San Luis Obispo and Santa Barbara Counties), 06 (except Kern County), 09 and 10.

  Contractors bidding on projects in these Districts may obtain lists of certified DBEs from the Department's Website at http://www.dot.ca.gov/hq/bep. The Department also publishes a quarterly directory of certified firms that may be ordered from the Publications Unit at (916) 445-3520.

  Contractors bidding on projects with DBE goals in Districts 05 (San Luis Obispo and Santa Barbara Counties), 06 (Kern County), 07, 08, 11 and 12 may continue to call Padilla & Associates at the telephone numbers listed in the Special Provisions.

- **Submission of DBE Information**
  Attention is directed to Section 2-1.02B, "Submission of DBE Information," of the special provisions, regarding submittal of the "CALTRANS BIDDER - DBE INFORMATION" form and GOOD FAITH EFFORT (GFE) DOCUMENTATION form.

  ALL bidders shall complete the "CALTRANS BIDDER - DBE INFORMATION" form included in the Proposal and submit it WITH THE BID.

  The apparent successful bidder (low bidder), the second low bidder and the third low bidder shall submit the GOOD FAITH EFFORT (GFE) DOCUMENTATION form by THE FOURTH DAY following bid opening.

  The bidder shall submit written confirmation from each DBE that the DBE is participating in the contract, and include the confirmation with the submittal of the bid or submit it by the time specified for submittal of the GOOD FAITH EFFORT (GFE) DOCUMENTATION form.

  FAILURE TO SUBMIT THE REQUIRED DBE INFORMATION AND THE GFE DOCUMENTATION, IF REQUIRED, BY THE TIMES SPECIFIED WILL BE GROUNDS FOR FINDING THE BID OR PROPOSAL NONRESPONSIVE.

  The provisions regarding the information and supporting documents the bidder should submit to establish the bidder's good faith efforts to meet the DBE goal, and the "DBE Information Good Faith Efforts" form in the Proposal, have been enhanced for clarification.

- **Award of Contract**
  Attention is directed to Section 3, "Award and Execution of Contract," of the special provisions regarding the time in which the contract will be awarded.

- The specifications for this project include Quality Control / Quality Assurance provisions for the contract item "Asphalt Concrete" in the Special Provisions. Asphalt concrete shall conform to the provisions in Section 11-1, "Quality Control / Quality Assurance," and the section entitled "Asphalt Concrete" in Section 10-1, "General," of the Special Provisions. Section 39, "Asphalt Concrete," of the Standard Specifications shall not apply to Type A and Type B asphalt concrete.

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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.

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DEPARTMENT OF TRANSPORTATION

NOTICE TO CONTRACTORS

CONTRACT NO. 10-049944

10-Ama-49-11.2/R17.7

Sealed proposals for the work shown on the plans entitled:

STATE OF CALIFORNIA; DEPARTMENT OF TRANSPORTATION; PROJECT PLANS FOR CONSTRUCTION ON STATE HIGHWAY IN AMADOR COUNTY IN AND NEAR SUTTER CREEK AND AMADOR CITY FROM JUNCTION ROUTE 104 TO 0.3 KM SOUTH OF RANCHERIA CREEK BRIDGE

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 November 5, 2003, 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 AMADOR COUNTY IN AND NEAR SUTTER CREEK AND AMADOR CITY FROM JUNCTION ROUTE 104 TO 0.3 KM SOUTH OF RANCHERIA CREEK BRIDGE

General work description: 2 lane expressway to be constructed on new alignment by grading and paving with asphalt concrete over aggregate base and with 2 bridges to be constructed.

This project has a goal of 15 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 any combination of the following Class C licenses which constitutes a majority of the work: C-12, C-8.

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

The Caltrans Central Region Construction Office is located at 5156 North Blackstone Avenue, Fresno, CA 93710. The District Duty Senior for this project can be reached at (209) 948-7849, or by fax at (209) 948-7358. The Department will consider bidder inquiries only when a completed "Bidder Inquiry" form is submitted. The "Bidder Inquiry" form is available on the Internet at:

http://www.dot.ca.gov/dist6/construction

To the extent feasible and at the discretion of the Department, completed "Bidder Inquiry" forms submitted for consideration will be investigated, and responses will be posted on the Internet at:

http://www.dot.ca.gov/dist6/construction

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 and Standard Plans are available through the State of California, Department of Transportation, Publications Unit, 1900 Royal Oaks Drive, Sacramento, CA 95815, Telephone No. (916) 445-3520.

Cross sections for this project are available at the office of the District Director of Transportation of the district in which the work is situated in paper copy format.

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

The Department of Transportation hereby notifies all bidders that it will affirmatively ensure 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 available through the California Department of Transportation's Electronic Project Document Distribution Site on the internet at http://hqidoc1.dot.ca.gov/. 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.

If there is a difference between the minimum wage rates predetermined by the United States 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 September 22, 2003

CLP

COPY OF ENGINEER'S ESTIMATE

(NOT TO BE USED FOR BIDDING PURPOSES)

10-049944

Item	Item Code	Item	Unit of Measure	Estimated Quantity
1	070012	PROGRESS SCHEDULE (CRITICAL PATH METHOD)	LS	LUMP SUM
2	070018	TIME-RELATED OVERHEAD	WDAY	400
3	032002	TEMPORARY ENVIRONMENTAL FENCE	M	510
4	074018	HEALTH AND SAFETY PLAN	LS	LUMP SUM
5	074019	PREPARE STORM WATER POLLUTION PREVENTION PLAN	LS	LUMP SUM
6	074020	WATER POLLUTION CONTROL	LS	LUMP SUM
7 (S)	120090	CONSTRUCTION AREA SIGNS	LS	LUMP SUM
8 (S)	120100	TRAFFIC CONTROL SYSTEM	LS	LUMP SUM
9 (S)	128650	PORTABLE CHANGEABLE MESSAGE SIGN	LS	LUMP SUM
10	150206	ABANDON CULVERT	EA	3
11	150605	REMOVE FENCE	M	5630
12	150715	REMOVE THERMOPLASTIC PAVEMENT MARKING	M2	39
13	150742	REMOVE ROADSIDE SIGN	EA	5
14	032003	REMOVE FLARED END SECTION	EA	3
15	150806	REMOVE PIPE	M	760
16	150820	REMOVE INLET	EA	3
17	032004	SALVAGE ROCK WALL	M3	420
18	151572	RECONSTRUCT METAL BEAM GUARD RAILING	M	150
19	152320	RESET ROADSIDE SIGN	EA	5
20 (S)	153103	COLD PLANE ASPHALT CONCRETE PAVEMENT	M2	1410

Item	Item Code	Item	Unit of Measure	Estimated Quantity
21	153210	REMOVE CONCRETE	M3	64
22	160101	CLEARING AND GRUBBING	LS	LUMP SUM
23	170101	DEVELOP WATER SUPPLY	LS	LUMP SUM
24	190101	ROADWAY EXCAVATION	M3	950 000
25	032005	ROADWAY EXCAVATION (TYPE R) (HAZARDOUS AND RESTRICTED MATERIAL)	M3	2970
26 (F)	192003	STRUCTURE EXCAVATION (BRIDGE)	M3	2200
27 (F)	192025	STRUCTURE EXCAVATION (CULVERT)	M3	260
28 (F)	192037	STRUCTURE EXCAVATION (RETAINING WALL)	M3	520
29 (F)	193003	STRUCTURE BACKFILL (BRIDGE)	M3	1310
30 (F)	193004	STRUCTURE BACKFILL (CULVERT)	M3	330
31 (F)	193013	STRUCTURE BACKFILL (RETAINING WALL)	M3	600
32	193031	PERVIOUS BACKFILL MATERIAL (RETAINING WALL)	M3	19
33	194001	DITCH EXCAVATION	M3	3900
34 (S)	202007	DUFF	M2	340 000
35 (S)	032006	EROSION CONTROL BLANKET (TYPE 1)	M2	9390
36 (S)	203003	STRAW (EROSION CONTROL)	TONN	72
37 (S)	203014	FIBER (EROSION CONTROL)	KG	7890
38 (S)	203024	COMPOST (EROSION CONTROL)	KG	27 200
39 (S)	203026	MOVE-IN/MOVE-OUT (EROSION CONTROL)	EA	4
40 (S)	203045	PURE LIVE SEED (EROSION CONTROL)	KG	260

Item	Item Code	Item	Unit of Measure	Estimated Quantity
41 (S)	203056	COMMERCIAL FERTILIZER (EROSION CONTROL)	KG	2440
42 (S)	203061	STABILIZING EMULSION (EROSION CONTROL)	KG	60
43 (S)	032007	TRANSPLANT EXISTING ELDERBERRY	EA	1
44	220101	FINISHING ROADWAY	LS	LUMP SUM
45	250401	CLASS 4 AGGREGATE SUBBASE	M3	21 900
46	260201	CLASS 2 AGGREGATE BASE	M3	28 800
47	290211	ASPHALT TREATED PERMEABLE BASE	M3	5090
48	390152	ASPHALT CONCRETE	TONN	39 400
49	394002	PLACE ASPHALT CONCRETE (MISCELLANEOUS AREA)	M2	2680
50	394040	PLACE ASPHALT CONCRETE DIKE (TYPE A)	M	4710
51	394044	PLACE ASPHALT CONCRETE DIKE (TYPE C)	M	120
52	394048	PLACE ASPHALT CONCRETE DIKE (TYPE E)	M	2320
53	394049	PLACE ASPHALT CONCRETE DIKE (TYPE F)	M	56
54	394052	SHOULDER RUMBLE STRIP (AC, ROLLED-IN INDENTATIONS)	STA	110
55	490511	FURNISH STEEL PILING (HP 250 X 85)	M	897
56 (S)	490512	DRIVE STEEL PILE (HP 250 X 85)	EA	58
57 (S)	500001	PRESTRESSING CAST-IN-PLACE CONCRETE	LS	LUMP SUM
58 (S)	500060	TIEDOWN ANCHOR	EA	30
59 (F)	510051	STRUCTURAL CONCRETE, BRIDGE FOOTING	M3	720
60 (F)	510053	STRUCTURAL CONCRETE, BRIDGE	M3	4100

Item	Item Code	Item	Unit of Measure	Estimated Quantity
61 (F)	510086	STRUCTURAL CONCRETE, APPROACH SLAB (TYPE N)	M3	135
62 (F)	510408	CLASS 1 CONCRETE (RETAINING WALL)	M3	160
63 (F)	510409	CLASS 1 CONCRETE (MINOR STRUCTURE)	M3	85
64 (F)	510413	CLASS 1 CONCRETE (BOX CULVERT)	M3	237
65 (F)	510502	MINOR CONCRETE (MINOR STRUCTURE)	M3	60
66 (S)	519129	JOINT SEAL ASSEMBLY (MR 101 MM - 160 MM)	M	50
67 (S-F)	520102	BAR REINFORCING STEEL (BRIDGE)	KG	512 000
68 (S-F)	520103	BAR REINFORCING STEEL (RETAINING WALL)	KG	8630
69 (S-F)	520107	BAR REINFORCING STEEL (BOX CULVERT)	KG	36 900
70 (S-F)	520110	BAR REINFORCING STEEL (EPOXY COATED) (BRIDGE)	KG	290 300
71	566011	ROADSIDE SIGN - ONE POST	EA	42
72	566012	ROADSIDE SIGN - TWO POST	EA	10
73	620904	300 MM ALTERNATIVE PIPE CULVERT	M	15
74	620909	450 MM ALTERNATIVE PIPE CULVERT	M	41
75	620913	600 MM ALTERNATIVE PIPE CULVERT	M	690
76	620919	750 MM ALTERNATIVE PIPE CULVERT	M	730
77	620924	900 MM ALTERNATIVE PIPE CULVERT	M	240
78	620930	1050 MM ALTERNATIVE PIPE CULVERT	M	410
79	650075	600 MM REINFORCED CONCRETE PIPE	M	170
80	650077	750 MM REINFORCED CONCRETE PIPE	M	200

Item	Item Code	Item	Unit of Measure	Estimated Quantity
81	650079	900 MM REINFORCED CONCRETE PIPE	M	220
82	650081	1050 MM REINFORCED CONCRETE PIPE	M	120
83	664010	300 MM CORRUGATED STEEL PIPE (2.01 MM THICK)	M	78
84	664020	600 MM CORRUGATED STEEL PIPE (2.01 MM THICK)	M	74
85	681134	80 MM PLASTIC PIPE (EDGE DRAIN)	M	7690
86	681137	80 MM PLASTIC PIPE (EDGE DRAIN OUTLET)	M	1030
87	032008	ROCK DRAIN	EA	3
88	682042	CLASS 2 PERMEABLE MATERIAL (BLANKET)	M3	770
89	685062	150 MM ALTERNATIVE PIPE UNDERDRAIN	M2	1440
90	698091	300 MM ALTERNATIVE PIPE DOWNDRAIN	M	380
91	698162	450 MM ALTERNATIVE PIPE DOWNDRAIN	M	150
92	705334	300 MM ALTERNATIVE FLARED END SECTION	EA	17
93	705336	450 MM ALTERNATIVE FLARED END SECTION	EA	2
94	705337	600 MM ALTERNATIVE FLARED END SECTION	EA	11
95	705338	750 MM ALTERNATIVE FLARED END SECTION	EA	10
96	705339	900 MM ALTERNATIVE FLARED END SECTION	EA	3
97	705340	1050 MM ALTERNATIVE FLARED END SECTION	EA	1
98	708058	900 MM ALTERNATIVE PIPE INLET	M	56
99	721008	ROCK SLOPE PROTECTION (LIGHT, METHOD B)	M3	710
100	721011	ROCK SLOPE PROTECTION (BACKING NO. 2, METHOD B)	M3	59

Item	Item Code	Item	Unit of Measure	Estimated Quantity
101	721024	ROCK SLOPE PROTECTION (1/4T, METHOD B)	M3	150
102	729010	ROCK SLOPE PROTECTION FABRIC	M2	2000
103	731505	MINOR CONCRETE (CURB AND SIDEWALK)	M3	70
104	731517	MINOR CONCRETE (GUTTER)	M3	5
105 (S-F)	750001	MISCELLANEOUS IRON AND STEEL	KG	9200
106 (S-F)	750501	MISCELLANEOUS METAL (BRIDGE)	KG	11 000
107 (S)	800051	FENCE (TYPE WM, METAL POST)	M	12 500
108 (S)	801192	1.5 M WIRE MESH GATE	EA	8
109 (S)	801272	4.3 M WIRE MESH GATE	EA	1
110 (S)	801277	6.4 M WIRE MESH GATE	EA	2
111	820107	DELINEATOR (CLASS 1)	EA	130
112	820118	GUARD RAILING DELINEATOR	EA	38
113	820132	OBJECT MARKER (TYPE L)	EA	48
114 (S)	832001	METAL BEAM GUARD RAILING	M	1290
115 (S)	839553	END SECTION	EA	8
116 (S)	839565	TERMINAL SYSTEM (TYPE SRT)	EA	19
117 (F)	839725	CONCRETE BARRIER (TYPE 736)	M	804
118 (S)	840513	PROFILED THERMOPLASTIC TRAFFIC STRIPE	M	25 000
119 (S)	840515	THERMOPLASTIC PAVEMENT MARKING	M2	420
120 (S)	840560	THERMOPLASTIC TRAFFIC STRIPE (SPRAYABLE)	M	12 300

Item	Item Code	Item	Unit of Measure	Estimated Quantity
121 (S)	850101	PAVEMENT MARKER (NON-REFLECTIVE)	EA	28
122 (S)	850111	PAVEMENT MARKER (RETROREFLECTIVE)	EA	2620
123 (S)	860201	SIGNAL AND LIGHTING	LS	LUMP SUM
124 (S)	860403	HIGHWAY LIGHTING	LS	LUMP SUM
125 (S)	861502	MODIFY SIGNAL	LS	LUMP SUM
126	999990	MOBILIZATION	LS	LUMP SUM

STATE OF CALIFORNIA

DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISIONS

Annexed to Contract No. 10-049944

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.

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.

AMENDMENTS TO JULY 1999 STANDARD SPECIFICATIONS

UPDATED JUNE 19, 2003

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 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.

SECTION 2: PROPOSAL REQUIREMENTS AND CONDITIONS

Issue Date: June 19, 2003

Section 2-1.03, "Examination of Plans, Specifications, Contract, and Site of Work," of the Standard Specifications is amended to read:

2-1.03 Examination of Plans, Specifications, Contract, and Site of Work

- The bidder shall examine carefully the site of the work contemplated, the plans and specifications, and the proposal and contract forms therefor. The submission of a bid shall be conclusive evidence that the bidder has investigated and is satisfied as to the general and local conditions to be encountered, as to the character, quality and scope of work to be performed, the quantities of materials to be furnished and as to the requirements of the proposal, plans, specifications and the contract.
- The submission of a bid shall also be conclusive evidence that the bidder is satisfied as to the character, quality and quantity of surface and subsurface materials or obstacles to be encountered insofar as this information was reasonably ascertainable from an inspection of the site and the records of exploratory work done by the Department as shown in the bid documents, as well as from the plans and specifications made a part of the contract.
- Where the Department has made investigations of site conditions including subsurface conditions in areas where work is to be performed under the contract, or in other areas, some of which may constitute possible local material sources,

bidders or contractors may, upon written request, inspect the records of the Department as to those investigations subject to and upon the conditions hereinafter set forth.

- Where there has been prior construction by the Department or other public agencies within the project limits, records of the prior construction that are currently in the possession of the Department and which have been used by, or are known to, the designers and administrators of the project will be made available for inspection by bidders or contractors, upon written request, subject to the conditions hereinafter set forth. The records may include, but are not limited to, as-built drawings, design calculations, foundation and site studies, project reports and other data assembled in connection with the investigation, design, construction and maintenance of the prior projects.
- Inspection of the records of investigations and project records may be made at the office of the district in which the work is situated, or in the case of records of investigations related to structure work, at the Transportation Laboratory in Sacramento, California.
- When a log of test borings or other record of geotechnical data obtained by the Department's investigation of surface and subsurface conditions is included with the contract plans, it is furnished for the bidders' or Contractor's information and its use shall be subject to the conditions and limitations set forth in this Section 2-1.03.
- In some instances, information considered by the Department to be of possible interest to bidders or contractors has been compiled as "Materials Information." The use of the "Materials Information" shall be subject to the conditions and limitations set forth in this Section 2-1.03 and Section 6-2, "Local Materials."
- When cross sections are not included with the plans, but are available, bidders or contractors may inspect the cross sections and obtain copies for their use, at their expense.
- When cross sections are included with the contract plans, it is expressly understood and agreed that the cross sections do not constitute part of the contract, do not necessarily represent actual site conditions or show location, character, dimensions and details of work to be performed, and are included in the plans only for the convenience of bidders and their use is subject to the conditions and limitations set forth in this Section 2-1.03.
- When contour maps were used in the design of the project, the bidders may inspect those maps, and if available, they may obtain copies for their use.
- The availability or use of information described in this Section 2-1.03 is not to be construed in any way as a waiver of the provisions of the first paragraph in this Section 2-1.03 and bidders and contractors are cautioned to make independent investigations and examinations as they deem necessary to be satisfied as to conditions to be encountered in the performance of the work and, with respect to possible local material sources, the quality and quantity of material available from the property and the type and extent of processing that may be required in order to produce material conforming to the requirements of the specifications.
- The Department assumes no responsibility for conclusions or interpretations made by a bidder or contractor based on the information or data made available by the Department. The Department does not assume responsibility for representation made by its officers or agents before the execution of the contract concerning surface or subsurface conditions, unless that representation is expressly stated in the contract.
- No conclusions or interpretations made by a bidder or contractor from the information and data made available by the Department will relieve a bidder or contractor from properly fulfilling the terms of the contract.

SECTION 5: CONTROL OF WORK

Issue Date: December 31, 2001

Section 5-1.02A, "Trench Excavation Safety Plans," of the Standard Specifications is amended to read:

5-1.02A Excavation Safety Plans

- The Construction Safety Orders of the Division of Occupational Safety and Health shall apply to all excavations. For all excavations 1.5 m or more in depth, the Contractor shall submit to the Engineer a detailed plan showing the design and details of the protective systems to be provided for worker protection from the hazard of caving ground during excavation. The detailed plan shall include any tabulated data and any design calculations used in the preparation of the plan. Excavation shall not begin until the detailed plan has been reviewed and approved by the Engineer.
- Detailed plans of protective systems for which the Construction Safety Orders require design by a registered professional engineer shall be prepared and signed by an engineer who is registered as a Civil Engineer in the State of California, and shall include the soil classification, soil properties, soil design calculations that demonstrate adequate stability of the protective system, and any other design calculations used in the preparation of the plan.
- No plan shall allow the use of a protective system less effective than that required by the Construction Safety Orders.

• If the detailed plan includes designs of protective systems developed only from the allowable configurations and slopes, or Appendices, contained in the Construction Safety Orders, the plan shall be submitted at least 5 days before the Contractor intends to begin excavation. If the detailed plan includes designs of protective systems developed from tabulated data, or designs for which design by a registered professional engineer is required, the plan shall be submitted at least 3 weeks before the Contractor intends to begin excavation.

• Attention is directed to Section 7-1.01E, "Trench Safety."

SECTION 9: MEASUREMENT AND PAYMENT

Issue Date: November 18, 2002

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

9-1.04 NOTICE OF POTENTIAL CLAIM

• It is the intention of this section that disputes between the parties arising under and by virtue of the contract be brought to the attention of the Engineer at the earliest possible time in order that the matters may be resolved, if possible, or other appropriate action promptly taken.

• Disputes will not be considered unless the Contractor has first complied with specified notice or protest requirements, including Section 4-1.03, "Changes," Section 5-1.116, "Differing Site Conditions," Section 8-1.06, "Time of Completion," Section 8-1.07, "Liquidated Damages," and Section 8-1.10, "Utility and Non-Highway Facilities."

• For disputes arising under and by virtue of the contract, including an act or failure to act by the Engineer, the Contractor shall provide a signed written initial notice of potential claim to the Engineer within 5 days from the date the dispute first arose. The initial notice of potential claim shall provide the nature and circumstances involved in the dispute which shall remain consistent through the dispute. The initial notice of potential claim shall be submitted on Form CEM-6201A furnished by the Department and shall be certified with reference to the California False Claims Act, Government Code Sections 12650-12655. The Contractor shall assign an exclusive identification number for each dispute, determined by chronological sequencing, based on the date of the dispute.

• The exclusive identification number for each dispute shall be used on the following corresponding documents:

A. Initial notice of potential claim.
B. Supplemental notice of potential claim.
C. Full and final documentation of potential claim.
D. Corresponding claim included in the Contractor's written statement of claims.

• The Contractor shall provide the Engineer the opportunity to examine the site of work within 5 days from the date of the initial notice of potential claim. The Contractor shall proceed with the performance of contract work unless otherwise specified or directed by the Engineer.

• Throughout the disputed work, the Contractor shall maintain records that provide a clear distinction between the incurred direct costs of disputed work and that of undisputed work. The Contractor shall allow the Engineer access to the Contractor's project records deemed necessary by the Engineer to evaluate the potential claim within 20 days of the date of the Engineer's written request.

• Within 15 days of submitting the initial notice of potential claim, the Contractor shall provide a signed supplemental notice of potential claim to the Engineer that provides the following information:

A. The complete nature and circumstances of the dispute which caused the potential claim.
B. The contract provisions that provide the basis of claim.
C. The estimated cost of the potential claim, including an itemized breakdown of individual costs and how the estimate was determined.
D. A time impact analysis of the project schedule that illustrates the effect on the scheduled completion date due to schedule changes or disruptions where a request for adjustment of contract time is made.

• The information provided in items A and B above shall provide the Contractor's complete reasoning for additional compensation or adjustments.

• The supplemental notice of potential claim shall be submitted on Form CEM-6201B furnished by the Department and shall be certified with reference to the California False Claims Act, Government Code Sections 12650-12655. The Engineer will evaluate the information presented in the supplemental notice of potential claim and provide a written response to the Contractor within 20 days of its receipt. If the estimated cost or effect on the scheduled completion date changes, the

Contractor shall update information in items C and D above as soon as the change is recognized and submit this information to the Engineer.

- Within 30 days of the completion of work related to the potential claim, the Contractor shall provide the full and final documentation of potential claim to the Engineer that provides the following information:

A. A detailed factual narration of events fully describing the nature and circumstances that caused the dispute, including, but not limited to, necessary dates, locations, and items of work affected by the dispute.
B. The specific provisions of the contract that support the potential claim and a statement of the reasons these provisions support and provide a basis for entitlement of the potential claim.
C. When additional monetary compensation is requested, the exact amount requested calculated in conformance with Section 9-1.03, "Force Account Payment," or Section 8-1.09, "Right of Way Delays," including an itemized breakdown of individual costs. These costs shall be segregated into the following cost categories:

    1. Labor – A listing of individuals, classifications, regular hours and overtime hours worked, dates worked, and other pertinent information related to the requested reimbursement of labor costs.
    2. Materials – Invoices, purchase orders, location of materials either stored or incorporated into the work, dates materials were transported to the project or incorporated into the work, and other pertinent information related to the requested reimbursement of material costs.
    3. Equipment – Listing of detailed description (make, model, and serial number), hours of use, dates of use and equipment rates. Equipment rates shall be at the applicable State rental rate as listed in the Department of Transportation publication entitled "Labor Surcharge and Equipment Rental Rates," in effect when the affected work related to the dispute was performed.
    4. Other categories as specified by the Contractor or the Engineer.

A. When an adjustment of contract time is requested the following information shall be provided:

    1. The specific dates for which contract time is being requested.
    2. The specific reasons for entitlement to a contract time adjustment.
    3. The specific provisions of the contract that provide the basis for the requested contract time adjustment.
    4. A detailed time impact analysis of the project schedule. The time impact analysis shall show the effect of changes or disruptions on the scheduled completion date to demonstrate entitlement to a contract time adjustment.

B. The identification and copies of the Contractor's documents and the substance of oral communications that support the potential claim.

- The full and final documentation of the potential claim shall be submitted on Form CEM-6201C furnished by the Department and shall be certified with reference to the California False Claims Act, Government Code Sections 12650-12655.
- Pertinent information, references, arguments, and data to support the potential claim shall be included in the full and final documentation of potential claim. Information submitted subsequent to the full and final documentation submittal will not be considered. Information required in the full and final documentation of potential claim, as listed in items A to E above, that is not applicable to the dispute may be exempted as determined by the Engineer. No full and final documentation of potential claim will be considered that does not have the same nature and circumstances, and basis of claim as those specified on the initial and supplemental notices of potential claim.
- The Engineer will evaluate the information presented in the full and final documentation of potential claim and provide a written response to the Contractor within 30 days of its receipt unless otherwise specified. The Engineer's receipt of the full and final documentation of potential claim shall be evidenced by postal receipt or the Engineer's written receipt if delivered by hand. If the full and final documentation of potential claim is submitted by the Contractor after acceptance of the work by the Director, the Engineer need not provide a written response.
- Provisions in this section shall not apply to those claims for overhead costs and administrative disputes that occur after issuance of the proposed final estimate. Administrative disputes are disputes of administrative deductions or retentions, contract item quantities, contract item adjustments, interest payments, protests of contract change orders as provided in Section 4-1.03A, "Procedure and Protest," and protests of the weekly statement of working days as provided in Section 8-1.06, "Time of Completion." Administrative disputes that occur prior to issuance of the proposed final estimate shall follow applicable requirements of this section. Information listed in the supplemental notice and full and final documentation of potential claim that is not applicable to the administrative dispute may be exempted as determined by the Engineer.

• Unless otherwise specified in the special provisions, the Contractor may pursue the administrative claim process pursuant to Section 9-1.07B, "Final Payment and Claims," for any potential claim found by the Engineer to be without merit.

• Failure of the Contractor to conform to specified dispute procedures shall constitute a failure to pursue diligently and exhaust the administrative procedures in the contract, and is deemed as the Contractor's waiver of the potential claim and a waiver of the right to a corresponding claim for the disputed work in the administrative claim process in conformance with Section 9-1.07B, "Final Payment of Claims," and shall operate as a bar to arbitration pursuant to Section 10240.2 of the California Public Contract Code.

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

9-1.07B Final Payment and Claims

• After acceptance by the Director, the Engineer will make a proposed final estimate in writing of the total amount payable to the Contractor, including an itemization of the total amount, segregated by contract item quantities, extra work and other bases for payment, and shall also show each deduction made or to be made for prior payments and amounts to be kept or retained under the provisions of the contract. Prior estimates and payments shall be subject to correction in the proposed final estimate. The Contractor shall submit written approval of the proposed final estimate or a written statement of claims arising under or by virtue of the contract so that the Engineer receives the written approval or statement of claims no later than close of business of the thirtieth day after receiving the proposed final estimate. If the thirtieth day falls on a Saturday, Sunday or legal holiday, then receipt of the written approval or statement of claims by the Engineer shall not be later than close of business of the next business day. The Contractor's receipt of the proposed final estimate shall be evidenced by postal receipt. The Engineer's receipt of the Contractor's written approval or statement of claims shall be evidenced by postal receipt or the Engineer's written receipt if delivered by hand.

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

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

• Except for claims for overhead costs and administrative disputes that occur after issuance of the proposed final estimate, the Contractor shall only provide the following two items of information for each claim:

A. The exclusive identification number that corresponds to the supporting full and final documentation of potential claim.
B. The final amount of requested additional compensation.

• If the final amount of requested additional compensation is different than the amount of requested compensation included in the full and final documentation of potential claim, the Contractor shall provide in the written statement of claims the reasons for the changed amount, the specific provisions of the contract which support the changed amount, and a statement of the reasons the provisions support and provide a basis for the changed amount. If the Contractor's claim fails to provide an exclusive identification number or if there is a disparity in the provided exclusive identification number, the Engineer will notify the Contractor of the omission or disparity. The Contractor shall have 15 days after receiving notification from the Engineer to correct the omission or disparity. If after the 15 days has elapsed, there is still an omission or disparity of the exclusive identification number assigned to the claim, the Engineer will assign the number. No claim will be considered that has any of the following deficiencies:

A. The claim does not have the same nature, circumstances, and basis as the corresponding full and final documentation of potential claim.
B. The claim does not have a corresponding full and final documentation of potential claim.
C. The claim was not included in the written statement of claims.
D. The Contractor did not comply with applicable notice or protest requirements of Sections 4-1.03, "Changes," 5-1.116, "Differing Site Condition," 8-1.06, "Time of Completion," 8-1.07, "Liquidated Damages," 8-1.10, "Utility and Non-Highway Facilities," and 9-1.04, "Notice of Potential Claim."

- Administrative disputes that occur after issuance of the proposed final estimate shall be included in the Contractor's written statement of claims in sufficient detail to enable the Engineer to ascertain the basis and amounts of those claims.
- The Contractor shall keep full and complete records of the costs and additional time incurred for work for which a claim for additional compensation is made. The Engineer or designated claim investigators or auditors shall have access to those records and any other records as may be required by the Engineer to determine the facts or contentions involved in the claims. Failure to permit access to those records shall be sufficient cause for denying the claims.
- The written statement of claims submitted by the Contractor shall be accompanied by a notarized certificate containing the following language:

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

_____ .
(name)

_____ *of*
(title)

_____ .
(company)

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

Dated _____

/s/ _____

Subscribed and sworn before me this _____ day

of _____ .

_____
(Notary Public)
My Commission
Expires _____

- Failure to submit the notarized certificate will be sufficient cause for denying the claim.
- Claims for overhead type expenses or costs, in addition to being certified as stated above, shall be supported and accompanied by an audit report of an independent Certified Public Accountant. Omission of a supporting audit report of an independent Certified Public Accountant shall result in denial of the claim and shall operate as a bar to arbitration, as to the claim, in conformance with the requirements in Section 10240.2 of the California Public Contract Code. Claims for overhead type expenses or costs shall be subject to audit by the State at its discretion. The costs of performing an audit examination and submitting the report shall be borne by the Contractor. The Certified Public Accountant's audit examination shall be performed in conformance with the requirements of the American Institute of Certified Public Accountants Attestation Standards. The audit examination and report shall depict the Contractor's project and company-wide financial records and shall specify the actual overall average daily rates for both field and home office overhead for the entire duration of the project, and whether the costs have been properly allocated. The rates of field and home office overhead shall exclude unallowable costs as determined in Title 48 of the Federal Acquisition Regulations, Chapter 1, Part 31. The audit examination and report shall determine if the rates of field and home office overhead are:

A. Allowable in conformance with the requirements in Title 48 of the Federal Acquisition Regulations, Chapter 1, Part 31.
B. Adequately supported by reliable documentation.
C. Related solely to the project under examination.

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

- If the Contractor files a timely written statement of claims in response to the proposed final estimate, the District that administers the contract will submit a claim position letter to the Contractor by hand delivery or deposit in the U.S. mail within 135 days of acceptance of the contract. The claim position letter will delineate the District's position on the Contractor's claims. If the Contractor disagrees with the claim position letter, the Contractor shall submit a written notification of its disagreement and a written request to meet with the board of review, to be received by the District not later than 15 days after the Contractor's receipt of the claim position letter. The written notification of disagreement shall set forth the basis for the Contractor's disagreement and be submitted to the office designated in the claim position letter. The Contractor's failure to provide a timely written notification of disagreement or timely written request to meet with the board of review shall constitute the Contractor's acceptance and agreement with the determinations provided in the claim position letter and with final payment pursuant to the claim position letter.
- If the Contractor files a timely notification of disagreement with the District claim position letter and a timely request to meet with the board of review, then the board of review, designated by the District Director to review claims that remain in dispute, will meet with the Contractor within 45 days after receipt by the District of the notification of disagreement.
- If the District fails to submit a claim position letter to the Contractor within 135 days after the acceptance of the contract and the Contractor has claims that remain in dispute, the Contractor may request a meeting with the board of review designated by the District Director to review claims that remain in dispute. The Contractor's request for a meeting shall identify the claims that remain in dispute. If the Contractor files a request for a meeting, the board of review will meet with the Contractor within 45 days after the District receives the request for the meeting.
- Attendance by the Contractor at the board of review meeting shall be mandatory. The board of review will review those claims and make a written recommendation thereon to the District Director. The final determination of claims, made by the District Director, will be sent to the Contractor by hand delivery or deposit in the U.S. mail. The Engineer will then make and issue the Engineer's final estimate in writing and within 30 days thereafter the State will pay the entire sum, if any, found due thereon. That final estimate shall be conclusive and binding against both parties to the contract on all questions relating to the amount of work done and the compensation payable therefor, except as otherwise provided in Sections 9-1.03C, "Records," and 9-1.09, "Clerical Errors."
- Failure of the Contractor to conform to the specified dispute procedures shall constitute a failure to pursue diligently and exhaust the administrative procedures in the contract and shall operate as a bar to arbitration in conformance with the requirements in Section 10240.2 of the California Public Contract Code.

SECTION 19: EARTHWORK

Issue Date: December 31, 2001

The third paragraph of Section 19-1.02, "Preservation of Property," of the Standard Specifications is amended to read:

- In addition to the provisions in Sections 5-1.02, "Plans and Working Drawings," and 5-1.02A, "Excavation Safety Plans," detailed plans of the protective systems for excavations on or affecting railroad property will be reviewed for adequacy of protection provided for railroad facilities, property, and traffic. These plans shall be submitted at least 9 weeks before the Contractor intends to begin excavation requiring the protective systems. Approval by the Engineer of the detailed plans for the protective systems will be contingent upon the plans being satisfactory to the railroad company involved.

SECTION 42: GROOVE AND GRIND PAVEMENT

Issue Date: December 31, 2001

The last sentence of the first subparagraph of the third paragraph in Section 42-2.02, "Construction," of the Standard Specifications is amended to read:

- After grinding has been completed, the pavement shall conform to the straightedge and profile requirements specified in Section 40-1.10, "Final Finishing."

SECTION 49: PILING

Issue Date: April 30, 2003

The first paragraph in Section 49-1.03, "Determination of Length," of the Standard Specifications is amended to read:

• Foundation piles of any material shall be of such length as is required to develop the nominal resistance, to obtain the specified penetration, and to extend into the cap or footing block as shown on the plans, or specified in the special provisions.

The fourth paragraph in Section 49-1.03, "Determination of Length," of the Standard Specifications is amended to read:

• Modification to the specified installation methods and specified pile tip elevation will not be considered at locations where tension or lateral load demands control design pile tip elevations or when the plans state that specified pile tip elevation shall not be revised.

The sixth and seventh paragraphs in Section 49-1.03, "Determination of Length," of the Standard Specifications are amended to read:

• Indicator compression pile load testing shall conform to the requirements in ASTM Designation: D 1143. The pile shall sustain the first compression test load applied which is equal to the nominal resistance in compression, as shown on the plans, with no more than 13 mm total vertical movement at the top of the pile measured relative to the top of the pile prior to the start of compression load testing.

• Indicator tension pile load testing shall conform to the requirements in ASTM Designation: D 3689. The loading apparatus described as "Load Applied to Pile by Hydraulic Jack(s) Acting at One End of Test Beam(s) Anchored to the Pile" shall not be used. The pile shall sustain the first tension test load applied which is equal to the nominal resistance in tension, as shown on the plans, with no more than 13 mm total vertical movement at the top of the pile measured relative to the top of the pile prior to the start of tension load testing.

The ninth paragraph in Section 49-1.03, "Determination of Length," of the Standard Specifications is amended to read:

• For driven piling, the Contractor shall furnish piling of sufficient length to obtain both the specified tip elevation and nominal resistance shown on the plans or specified in the special provisions. For cast-in-drilled-hole concrete piling, the Contractor shall construct piling of such length to develop the nominal resistance in compression and to obtain the specified tip elevation shown on the plans or specified in the special provisions.

The tenth paragraph in Section 49-1.03, "Determination of Length," of the Standard Specifications is deleted.

The fourth paragraph in Section 49-1.04, "Load Test Piles," of the Standard Specifications is amended to read:

• Load test piles and anchor piles which are not to be incorporated in the completed structure shall be removed in conformance with the provisions in Section 15-4.02, "Removal Methods," and the remaining holes shall be backfilled with earth or other suitable material approved by the Engineer.

The first paragraph in Section 49-1.05, "Driving Equipment," of the Standard Specifications is amended to read:

• Driven piles shall be installed with impact hammers that are approved in writing by the Engineer. Impact hammers shall be steam, hydraulic, air or diesel hammers. Impact hammers shall develop sufficient energy to drive the piles at a penetration rate of not less than 3 mm per blow at the specified nominal resistance.

The seventh paragraph in Section 49-1.05, "Driving Equipment," of the Standard Specifications is amended to read:

• When necessary to obtain the specified penetration and when authorized by the Engineer, the Contractor may supply and operate one or more water jets and pumps, or furnish the necessary drilling apparatus and drill holes not greater than the least dimension of the pile to the proper depth and drive the piles therein. Jets shall not be used at locations where the stability of embankments or other improvements would be endangered. In addition, for steel piles, steel shells, or steel casings, when necessary to obtain the specified penetration or to prevent damage to the pile during installation, the Contractor shall provide special driving tips or heavier pile sections or take other measures as approved by the Engineer.

• The use of followers or underwater hammers for driving piles will be permitted if authorized in writing by the Engineer. When a follower or underwater hammer is used, its efficiency shall be verified by furnishing the first pile in each bent or footing sufficiently long and driving the pile without the use of a follower or underwater hammer.

The second paragraph in Section 49-1.07, "Driving," of the Standard Specifications is amended to read:

• Timber piles shall be fresh-headed and square and when permitted by the Engineer, the heads of the piles may be protected by means of heavy steel or wrought iron rings. During driving operations timber piling shall be restrained from lateral movement at intervals not to exceed 6 m over the length between the driving head and the ground surface. During driving operations, the timber pile shall be kept moving by continuous operation of the hammer. When the blow count exceeds either 2 times the blow count required in 300 mm, or 3 times the blow count required in 75 mm for the nominal resistance as shown on the plans, computed in conformance with the provisions in Section 49-1.08, "Pile Driving Acceptance Criteria," additional aids shall be used to obtain the specified penetration. These aids may include the use of water jets or drilling, where permitted, or the use of a larger hammer employing a heavy ram striking with a low velocity.

Section 49-1.08, "Bearing Value and Penetration," of the Standard Specifications is amended to read:

49-1.08 PILE DRIVING ACCEPTANCE CRITERIA

• Except for piles to be load tested, driven piles shall be driven to a value of not less than the nominal resistance shown on the plans unless otherwise specified in the special provisions or permitted in writing by the Engineer. In addition, when a pile tip elevation is specified, driven piles shall penetrate at least to the specified tip elevation, unless otherwise permitted in writing by the Engineer. Piles to be load tested shall be driven to the specified tip elevation.

• When the pile nominal resistance is omitted from the plans or the special provisions, timber piles shall be driven to a nominal resistance of 800 kN, and steel and concrete piles shall be driven to a nominal resistance of 1250 kN.

• The nominal resistance for driven piles shall be determined from the following formula in which "R_u" is the nominal resistance in kilonewtons, "E_r" is the manufacturer's rating for joules of energy developed by the hammer at the observed field drop height, and "N" is the number of hammer blows in the last 300 millimeters. (maximum value to be used for N is 100):

$$R_u = (7 * (E_r)^{1/2} * \log_{10} (0.83 * N)) - 550$$

Section 49-3.01, "Description," of the Standard Specifications is amended by deleting the fifth paragraph.

The sixth paragraph in Section 49-4.01, "Description," of the Standard Specifications is amended to read:

• Lifting anchors used in precast prestressed concrete piles without a class designation ending in "C" (corrosion resistant) shall be removed, and the holes filled in conformance with the provisions in Section 51-1.18A, "Ordinary Surface Finish."

The first and second paragraphs in Section 49-4.01, "Description," of the Standard Specifications are amended to read:

• Cast-in-place concrete piles shall consist of one of the following:

A. Steel shells driven permanently to the required nominal resistance and penetration and filled with concrete.
B. Steel casings installed permanently to the required penetration and filled with concrete.
C. Drilled holes filled with concrete.
D. Rock sockets filled with concrete.

• The drilling of holes shall conform to the provisions in these specifications. Concrete filling for cast-in-place concrete piles is designated by compressive strength and shall have a minimum 28-day compressive strength of 25 MPa. At the option of the Contractor, the combined aggregate grading for the concrete shall be either the 25-mm maximum grading, the 12.5-mm maximum grading, or the 9.5-mm maximum grading. Concrete shall conform to the provisions in Section 90, "Portland Cement Concrete," and Section 51, "Concrete Structures." Reinforcement shall conform to the provisions in Section 52, "Reinforcement."

The fourth paragraph in Section 49-4.03, "Drilled Holes," of the Standard Specifications is amended to read:

• After placing reinforcement and prior to placing concrete in the drilled hole, if caving occurs or deteriorated foundation material accumulates on the bottom of the hole, the bottom of the drilled hole shall be cleaned. The Contractor shall verify that the bottom of the drilled hole is clean.

The first and second paragraphs in Section 49-4.04, "Steel Shells," of the Standard Specifications are amended to read:

• Steel shells shall be sufficiently watertight to exclude water during the placing of concrete. The shells may be cylindrical or tapered, step-tapered, or a combination of either, with cylindrical sections.

The first paragraph in Section 49-4.05, "Inspection," of the Standard Specifications is amended to read:

• After being driven and prior to placing reinforcement and concrete therein, the steel shells shall be examined for collapse or reduced diameter at any point. Any shell which is improperly driven or broken or shows partial collapse to such an extent as to materially decrease its nominal resistance will be rejected. Rejected shells shall be removed and replaced, or a new shell shall be driven adjacent to the rejected shell. Rejected shells which cannot be removed shall be filled with concrete by the Contractor at the Contractor's expense. When a new shell is driven to replace a rejected shell, the Contractor, at the Contractor's expense, shall enlarge the footing as determined necessary by the Engineer.

The third paragraph in Section 49-6.02, "Payment," of the Standard Specifications is amended to read:

• The contract price paid per meter for cast-in-drilled-hole concrete piling shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all work involved in drilling holes, disposing of material resulting from drilling holes, temporarily casing holes and removing water when necessary, furnishing and placing concrete and reinforcement, and constructing reinforced concrete extensions, complete in place, to the required penetration, as shown on the plans, as specified in these specifications and in the special provisions, and as directed by the Engineer.

The seventh paragraph in Section 49-6.02, "Payment," of the Standard Specifications is amended to read

• The contract unit price paid for drive pile shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in driving timber, concrete and steel piles, driving steel shells for cast-in-place concrete piles, placing filling materials for cast-in-place concrete piles and cutting off piles, all complete in place to the required nominal resistance and penetration as shown on the plans and as specified in these specifications and the special provisions, and as directed by the Engineer.

The ninth paragraph in Section 49-6.02, "Payment," of the Standard Specifications is amended to read:

• Full compensation for all jetting, drilling, providing special driving tips or heavier sections for steel piles or shells, or other work necessary to obtain the specified penetration and nominal resistance of the piles, for predrilling holes through embankment and filling the space remaining around the pile with sand or pea gravel, for disposing of material resulting from jetting, drilling or predrilling holes, and for all excavation and backfill involved in constructing concrete extensions as shown on the plans, and as specified in these specifications and the special provisions, and as directed by the Engineer shall be considered as included in the contract unit price paid for drive pile or in the contract price paid per meter for cast-in-drilled-hole concrete piling, and no additional compensation will be allowed therefor.

Section 49-6.02, "Payment," of the Standard Specifications is amended by adding the following paragraphs:

Full compensation for furnishing and placing additional testing reinforcement, for load test anchorages, and for cutting off test piles, shall be considered as included in the contract price paid for piling of the type or class shown in the Engineer's Estimate, and no additional compensation will be allowed.

No additional compensation or extension of time will be made for additional foundation investigation, installation and testing of indicator piling, cutting off piling and restoring the foundation investigation and indicator pile sites, and review of request by the Engineer

SECTION 50: PRESTRESSING CONCRETE

Issue Date: November 18, 2002

Section 50-1.02, "Drawings," of the Standard Specifications is amended by adding the following paragraph after the second paragraph:

• Each working drawing submittal shall consist of plans for a single bridge or portion thereof. For multi-frame bridges, each frame shall require a separate working drawing submittal.

Section 50-1.05, "Prestressing Steel," of the Standard Specifications is amended to read:

• Prestressing steel shall be high-tensile wire conforming to the requirements in ASTM Designation: A 421, including Supplement I; high-tensile seven-wire strand conforming to the requirements in ASTM Designation: A 416; or uncoated high-strength steel bars conforming to the requirements in ASTM Designation: A 722, including all supplementary requirements. The maximum mass requirement of ASTM Designation: A 722 will not apply.

• In addition to the requirements of ASTM Designation: A 722, for deformed bars, the reduction of area shall be determined from a bar from which the deformations have been removed. The bar shall be machined no more than necessary to remove the deformations over a length of 300 mm, and reduction will be based on the area of the machined portion.

• In addition to the requirements specified herein, epoxy-coated seven-wire prestressing steel strand shall be grit impregnated and filled in conformance with the requirements in ASTM Designation: A 882/A 882M, including Supplement I, and the following:

A. The coating material shall be on the Department's list of approved coating materials for epoxy-coated strand, available from the Transportation Laboratory.
B. The film thickness of the coating after curing shall be 381 µm to 1143 µm.
C. Prior to coating the strand, the Contractor shall furnish to the Transportation Laboratory a representative 230-g sample from each batch of epoxy coating material to be used. Each sample shall be packaged in an airtight container identified with the manufacturer's name and batch number.
D. Prior to use of the epoxy-coated strand in the work, written certifications referenced in ASTM Designation: A 882/A 882M, including a representative load-elongation curve for each size and grade of strand to be used and a copy of the quality control tests performed by the manufacturer, shall be furnished to the Engineer.
E. In addition to the requirements in Section 50-1.10, "Samples for Testing," four 1.5-m long samples of coated strand and one 1.5-m long sample of uncoated strand of each size and reel shall be furnished to the Engineer for testing. These samples, as selected by the Engineer, shall be representative of the material to be used in the work.
F. Epoxy-coated strand shall be cut using an abrasive saw.
G. All visible damage to coatings caused by shipping and handling, or during installation, including cut ends, shall be repaired in conformance with the requirements in ASTM Designation: A 882/A 882M. The patching material shall be furnished by the manufacturer of the epoxy powder and shall be applied in conformance with the manufacturer's written recommendations. The patching material shall be compatible with the original epoxy coating material and shall be inert in concrete.

• All bars in any individual member shall be of the same grade, unless otherwise permitted by the Engineer.

• When bars are to be extended by the use of couplers, the assembled units shall have a tensile strength of not less than the manufacturer's minimum guaranteed ultimate tensile strength of the bars. Failure of any one sample to meet this requirement will be cause for rejection of the heat of bars and lot of couplers. The location of couplers in the member shall be subject to approval by the Engineer.

• Wires shall be straightened if necessary to produce equal stress in all wires or wire groups or parallel lay cables that are to be stressed simultaneously or when necessary to ensure proper positioning in the ducts.

• Where wires are to be button-headed, the buttons shall be cold formed symmetrically about the axes of the wires. The buttons shall develop the minimum guaranteed ultimate tensile strength of the wire. No cold forming process shall be used that causes indentations in the wire. Buttonheads shall not contain wide open splits, more than 2 splits per head, or splits not parallel with the axis of the wire.

• Prestressing steel shall be protected against physical damage and rust or other results of corrosion at all times from manufacture to grouting or encasing in concrete. Prestressing steel that has sustained physical damage at any time shall be rejected. The development of visible rust or other results of corrosion shall be cause for rejection, when ordered by the Engineer.

• Epoxy-coated prestressing steel strand shall be covered with an opaque polyethylene sheeting or other suitable protective material to protect the strand from exposure to sunlight, salt spray, and weather. For stacked coils, the protective covering shall be draped around the perimeter of the stack. The covering shall be adequately secured; however, it should

allow for air circulation around the strand to prevent condensation under the covering. Epoxy-coated strand shall not be stored within 300 m of ocean or tidal water for more than 2 months.

- Prestressing steel shall be packaged in containers or shipping forms for the protection of the steel against physical damage and corrosion during shipping and storage. Except for epoxy-coated strand, a corrosion inhibitor which prevents rust or other results of corrosion, shall be placed in the package or form, or shall be incorporated in a corrosion inhibitor carrier type packaging material, or when permitted by the Engineer, may be applied directly to the steel. The corrosion inhibitor shall have no deleterious effect on the steel or concrete or bond strength of steel to concrete. Packaging or forms damaged from any cause shall be immediately replaced or restored to original condition.
- The shipping package or form shall be clearly marked with a statement that the package contains high-strength prestressing steel, and the type of corrosion inhibitor used, including the date packaged.
- Prestressing steel for post-tensioning which is installed in members prior to placing and curing of the concrete, and which is not epoxy-coated, shall be continuously protected against rust or other results of corrosion, until grouted, by means of a corrosion inhibitor placed in the ducts or applied to the steel in the duct. The corrosion inhibitor shall conform to the provisions specified herein.
- When steam curing is used, prestressing steel for post-tensioning shall not be installed until the steam curing is completed.
- Water used for flushing ducts shall contain either quick lime (calcium oxide) or slaked lime (calcium hydroxide) in the amount of 0.01-kg/L. Compressed air used to blow out ducts shall be oil free.
- When prestressing steel for post-tensioning is installed in the ducts after completion of concrete curing, and if stressing and grouting are completed within 10 days after the installation of the prestressing steel, rust which may form during those 10 days will not be cause for rejection of the steel. Prestressing steel installed, tensioned, and grouted in this manner, all within 10 days, will not require the use of a corrosion inhibitor in the duct following installation of the prestressing steel. Prestressing steel installed as above but not grouted within 10 days shall be subject to all the requirements in this section pertaining to corrosion protection and rejection because of rust. The requirements in this section pertaining to tensioning and grouting within 10 days shall not apply to epoxy-coated prestressing steel strand.
- Any time prestressing steel for pretensioning is placed in the stressing bed and is exposed to the elements for more than 36 hours prior to encasement in concrete, adequate measures shall be taken by the Contractor, as approved by the Engineer, to protect the steel from contamination or corrosion.
- After final fabrication of the seven-wire prestressing steel strand, no electric welding of any form shall be performed on the prestressing steel. Whenever electric welding is performed on or near members containing prestressing steel, the welding ground shall be attached directly to the steel being welded.
- Pretensioned prestressing steel shall be cut off flush with the end of the member. For epoxy-coated prestressing steel, only abrasive saws shall be used to cut the steel. The exposed ends of the prestressing steel and a 25-mm strip of adjoining concrete shall be cleaned and painted. Cleaning shall be by wire brushing or abrasive blast cleaning to remove all dirt and residue on the metal or concrete surfaces. Immediately after cleaning, the surfaces shall be covered with one application of unthinned zinc-rich primer (organic vehicle type) conforming to the provisions in Section 91, "Paint," except that 2 applications shall be applied to surfaces which will not be covered by concrete or mortar. Aerosol cans shall not be used. The paint shall be thoroughly mixed at the time of application and shall be worked into any voids in the prestressing tendons.

The thirteenth paragraph in Section 50-1.08, "Prestressing," of the Standard Specifications is amended to read:

- Prestressing steel in pretensioned members shall not be cut or released until the concrete in the member has attained a compressive strength of not less than the value shown on the plans or 28 MPa, whichever is greater. In addition to these concrete strength requirements, when epoxy-coated prestressing steel strand is used, the steel shall not be cut or released until the temperature of the concrete surrounding the strand is less than 65°C, and falling.

The fifth paragraph in Section 50-1.10, "Samples for Testing," of the Standard Specifications is amended to read:

- The following samples of materials and tendons, selected by the Engineer from the prestressing steel at the plant or jobsite, shall be furnished by the Contractor to the Engineer well in advance of anticipated use:

A. For wire or bars, one 2-m long sample and for strand, one 1.5-m long sample, of each size shall be furnished for each heat or reel.
B. For epoxy-coated strand, one 1.5-m long sample of uncoated strand of each size shall be furnished for each reel.

C. If the prestressing tendon is a bar, one 2-m long sample shall be furnished and in addition, if couplers are to be used with the bar, two 1.25-m long samples of bar, equipped with one coupler and fabricated to fit the coupler, shall be furnished.

The second paragraph in Section 50-1.11, "Payment," of the Standard Specifications is amended to read:

• The contract lump sum prices paid for prestressing cast-in-place concrete of the types listed in the Engineer's Estimate shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all work involved in furnishing, placing, and tensioning the prestressing steel in cast-in-place concrete structures, complete in place, as shown on the plans, as specified in these specifications and the special provisions, and as directed by the Engineer.

SECTION 51: CONCRETE STRUCTURES

Issue Date: April 16, 2003

The first and second paragraph in Section 51-1.06A, "Falsework Design and Drawings," of the Standard Specifications are amended to read:

• The Contractor shall submit to the Engineer working drawings and design calculations for falsework proposed for use at bridges. For bridges where the height of any portion of the falsework, as measured from the ground line to the soffit of the superstructure, exceeds 4.25 m; or where any individual falsework clear span length exceeds 4.85 m; or where provision for vehicular, pedestrian, or railroad traffic through the falsework is made; the drawings shall be signed by an engineer who is registered as a Civil Engineer in the State of California. Six sets of the working drawings and 2 copies of the design calculations shall be furnished. Additional working drawings and design calculations shall be submitted to the Engineer when specified in "Railroad Relations and Insurance" of the special provisions.

• The falsework drawings shall include details of the falsework erection and removal operations showing the methods and sequences of erection and removal and the equipment to be used. The details of the falsework erection and removal operations shall demonstrate the stability of all or any portions of the falsework during all stages of the erection and removal operations.

The seventh paragraph in Section 51-1.06A, "Falsework Design and Drawings," of the Standard Specifications is amended to read:

• In the event that several falsework plans are submitted simultaneously, or an additional plan is submitted for review before the review of a previously submitted plan has been completed, the Contractor shall designate the sequence in which the plans are to be reviewed. In such event, the time to be provided for the review of any plan in the sequence shall be not less than the review time specified above for that plan, plus 2 weeks for each plan of higher priority which is still under review. A falsework plan submittal shall consist of plans for a single bridge or portion thereof. For multi-frame bridges, each frame shall require a separate falsework plan submittal.

Section 51-1.06A, "Falsework Design and Drawings," of the Standard Specifications is amended by adding the following paragraphs:

• If structural composite lumber is proposed for use, the falsework drawings shall clearly identify the structural composite lumber members by grade (E value), species, and type. The Contractor shall provide technical data from the manufacturer showing the tabulated working stress values of the composite lumber. The Contractor shall furnish a certificate of compliance as specified in Section 6-1.07, "Certificates of Compliance," for each delivery of structural composite lumber to the project site.

• For falsework piles with a calculated loading capacity greater than 900 kN, the falsework piles shall be designed by an engineer who is registered as either a Civil Engineer or a Geotechnical Engineer in the State of California, and the calculations shall be submitted to the Engineer.

The first paragraph in Section 51-1.06A(1), "Design Loads," of the Standard Specifications is amended to read:

• The design load for falsework shall consist of the sum of dead and live vertical loads, and an assumed horizontal load. The minimum total design load for any falsework, including members that support walkways, shall be not less than 4800 N/m^2 for the combined live and dead load regardless of slab thickness.

The eighth paragraph in Section 51-1.06A(1), "Design Loads," of the Standard Specifications is amended to read:

- In addition to the minimum requirements specified in this Section 51-1.06A, falsework for box girder structures with internal falsework bracing systems using flexible members capable of withstanding tensile forces only, shall be designed to include the vertical effects caused by the elongation of the flexible member and the design horizontal load combined with the dead and live loads imposed by concrete placement for the girder stems and connected bottom slabs. Falsework comprised of individual steel towers with bracing systems using flexible members capable of withstanding tensile forces only to resist overturning, shall be exempt from these additional requirements.

The third paragraph in Section 51-1.06B, "Falsework Construction," of the Standard Specifications is amended to read:

- When falsework is supported on piles, the piles shall be driven and the actual nominal resistance assessed in conformance with the provisions in Section 49, "Piling."

Section 51-1.06B, "Falsework Construction," of the Standard Specifications is amended by adding the following paragraphs:

- For falsework piles with a calculated nominal resistance greater than 1800 kN, the Contractor shall conduct dynamic monitoring of pile driving and generate field acceptance criteria based on a wave equation analysis. These analyses shall be signed by an engineer who is registered as a Civil Engineer in the State of California and submitted to the Engineer prior to completion of falsework erection.

- Prior to the placement of falsework members above the stringers, the final bracing system for the falsework shall be installed.

Section 51-1.06C, "Removing Falsework," of the Standard Specifications is amended by adding the following paragraph:

- The falsework removal operation shall be conducted in such a manner that any portion of the falsework not yet removed remains in a stable condition at all times.

The sixth paragraph in Section 51-1.09, "Placing Concrete," of the Standard Specifications is amended to read:

- Vibrators used to consolidate concrete containing epoxy-coated bar reinforcement or epoxy-coated prestressing steel shall have a resilient covering to prevent damage to the epoxy-coating on the reinforcement or prestressing steel.

The table in the ninth paragraph of Section 51-1.12H(1), "Plain and Fabric Reinforced Elastomeric Bearing Pads," of the Standard Specifications is amended to read:

Tensile strength, percent	-15
Elongation at break, percent	-40; but not less than 300% total elongation of the material
Hardness, points	+10

The first sentence of the fourth paragraph in Section 51-1.17, "Finish Bridge Decks," of the Standard Specifications is amended to read:

- The smoothness of completed roadway surfaces of structures, approach slabs and the adjacent 15 m of approach pavement, and the top surfaces of concrete decks which are to be covered with another material, will be tested by the Engineer with a bridge profilograph in conformance with the requirements in California Test 547 and the requirements herein.

Section 51-1.17, "Finishing Bridge Decks," of the Standard Specifications is amended by deleting the seventh, thirteenth and fourteenth paragraphs.

The fourteenth paragraph in Section 51-1.23, "Payment," of the Standard Specifications is amended by deleting "and injecting epoxy in cracks".

SECTION 52: REINFORCEMENT

Issue Date: December 31, 2001

The third paragraph in Section 52-1.04, "Inspection," of the Standard Specifications is amended to read:

- A Certificate of Compliance conforming to the provisions in Section 6-1.07, "Certificates of Compliance," shall also be furnished for each shipment of epoxy-coated bar reinforcement or wire reinforcement certifying that the coated reinforcement conforms to the requirements in ASTM Designation: A 775/A 775M or A 884/A 884M, respectively, and the provisions in Section 52-1.02B, "Epoxy-coated Reinforcement." The Certificate of Compliance shall include all of the certifications specified in ASTM Designation: A 775/A 775M or A 884/A 884M respectively, and a statement that the coating material has been prequalified by acceptance testing performed by the Valley Forge Laboratories, Inc., Devon, Pennsylvania.

The third paragraph in Section 52-1.08C, "Mechanical Butt Splices," of the Standard Specifications is amended to read:

- The total slip of the reinforcing bars within the splice sleeve after loading in tension to 200 MPa and relaxing to 20 MPa shall not exceed the values listed in the following table. The slip shall be measured between gage points that are clear of the splice sleeve.

Reinforcing Bar Number	Total Slip (μm)
13	250
16	250
19	250
22	350
25	350
29	350
32	450
36	450
43	600
57	750

The first paragraph in Section 52-1.08C(5), "Sleeve-Lockshear Bolt Mechanical Butt Splices," of the Standard Specifications is amended to read:

- The sleeve-lockshear bolt type of mechanical butt splices shall consist of a seamless steel sleeve, center hole with centering pin, and bolts that are tightened until the bolt heads shear off with the bolt ends left embedded in the reinforcing bars. The seamless steel sleeve shall be either formed into a V configuration or shall have 2 serrated steel strips welded to the inside of the sleeve.

Section 52-1.08F, "Nondestructive Splice Tests," of the Standard Specifications is amended by deleting the seventh paragraph.

SECTION 55: STEEL STRUCTURES

Issue Date: December 31, 2001

Section 55-3.14, "Bolted Connections," of the Standard Specifications is amended by adding the following after the ninth paragraph:

- If a torque multiplier is used in conjunction with a calibrated wrench as a method for tightening fastener assemblies to the required tension, both the multiplier and the wrench shall be calibrated together as a system. The same length input and output sockets and extensions that will be used in the work shall also be included in the calibration of the system. The

manufacturer's torque multiplication ratio shall be adjusted during calibration of the system, such that when this adjusted ratio is multiplied by the actual input calibrated wrench reading, the product is a calculated output torque that is within 2 percent of the true output torque. When this system is used in the work to perform any installation tension testing, rotational capacity testing, fastener tightening, or tension verification, it shall be used, intact as calibrated.

The sixth paragraph of Section 55-4.02, "Payment," of the Standard Specifications is amended to read:

- If a portion or all of the structural steel is fabricated more than 480 air line kilometers from both Sacramento and Los Angeles, additional shop inspection expenses will be sustained by the State. Whereas it is and will be impracticable and extremely difficult to ascertain and determine the actual increase in these expenses, it is agreed that payment to the Contractor for furnishing the structural steel from each fabrication site located more than 480 air line kilometers from both Sacramento and Los Angeles will be reduced $5000 or by an amount computed at $0.044 per kilogram of structural steel fabricated, whichever is greater, or in the case of each fabrication site located more than 4800 air line kilometers from both Sacramento and Los Angeles, payment will be reduced $8000 or by $0.079 per kilogram of structural steel fabricated, whichever is greater.

SECTION 56: SIGNS

Issue Date: December 31, 2001

Section 56-1.01, "Description," of the Standard Specifications is amended by deleting the third paragraph.

The sixth through the thirteenth paragraphs in Section 56-1.03, "Fabrication," of the Standard Specifications are amended to read:

- High-strength bolted connections, where shown on the plans, shall conform to the provisions in Section 55-3.14, "Bolted Connections," except that only fastener assemblies consisting of a high-strength bolt, nut, hardened washer, and direct tension indicator shall be used.
- High-strength fastener assemblies, and any other bolts, nuts, and washers attached to sign structures shall be zinc-coated by the mechanical deposition process.
- An alternating snugging and tensioning pattern for anchor bolts and high-strength bolted splices shall be used. Once tensioned, high-strength fastener components and direct tension indicators shall not be reused.
- For bolt diameters less than 10 mm, the diameter of the bolt hole shall be not more than 0.80-mm larger than the nominal bolt diameter. For bolt diameters greater than or equal to 10 mm, the diameter of the bolt hole shall be not more than 1.6 mm larger than the nominal bolt diameter.
- Sign structures shall be fabricated into the largest practical sections prior to galvanizing.
- Ribbed sheet metal panels for box beam closed truss sign structures shall be fastened to the truss members by cap screws or bolts as shown on the plans, or by 4.76 mm stainless steel blind rivets conforming to Industrial Fasteners Institute, Standard IFI-114, Grade 51. The outside diameter of the large flange rivet head shall be not less than 15.88 mm in diameter. Web splices in ribbed sheet metal panels may be made with similar type blind rivets of a size suitable for the thickness of material being connected.
- Spalling or chipping of concrete structures shall be repaired by the Contractor at the Contractor's expense.
- Overhead sign supports shall have an aluminum identification plate permanently attached near the base, adjacent to the traffic side on one of the vertical posts, using either stainless steel rivets or stainless steel screws. As a minimum, the information on the plate shall include the name of the manufacturer, the date of manufacture and the contract number.

SECTION 59: PAINTING

Issue Date: December 31, 2001

Section 59-2.01, "General," of the Standard Specifications is amended by adding the following paragraphs after the first paragraph:

- Unless otherwise specified, no painting Contractors or subcontractors will be permitted to commence work without having the following current "SSPC: The Society for Protective Coatings" (formerly the Steel Structures Painting Council) certifications in good standing:

A. For cleaning and painting structural steel in the field, certification in conformance with the requirements in Qualification Procedure No. 1, "Standard Procedure For Evaluating Painting Contractors (Field Application to Complex Industrial Structures)" (SSPC-QP 1).
B. For removing paint from structural steel, certification in conformance with the requirements in Qualification Procedure No. 2, "Standard Procedure For Evaluating Painting Contractors (Field Removal of Hazardous Coatings from Complex Structures)" (SSPC-QP 2).
C. For cleaning and painting structural steel in a permanent painting facility, certification in conformance with the requirements in Qualification Procedure No. 3, "Standard Procedure For Evaluating Qualifications of Shop Painting Applicators" (SSPC-QP 3). The AISC's Sophisticated Paint Endorsement (SPE) quality program will be considered equivalent to SSPC-QP 3.

The third paragraph of Section 59-2.03, "Blast Cleaning," of the Standard Specifications is amended to read:

• Exposed steel or other metal surfaces to be blast cleaned shall be cleaned in conformance with the requirements in Surface Preparation Specification No. 6, "Commercial Blast Cleaning," of the "SSPC: The Society for Protective Coatings." Blast cleaning shall leave all surfaces with a dense, uniform, angular anchor pattern of not less than 35 µm as measured in conformance with the requirements in ASTM Designation: D 4417.

The first paragraph of Section 59-2.06, "Hand Cleaning," of the Standard Specifications is amended to read:

• Dirt, loose rust and mill scale, or paint which is not firmly bonded to the surfaces shall be removed in conformance with the requirements in Surface Preparation Specification No. 2, "Hand Tool Cleaning," of the "SSPC: The Society for Protective Coatings." Edges of old remaining paint shall be feathered.

The fourth paragraph of Section 59-2.12, "Painting," of the Standard Specifications is amended to read:

• The dry film thickness of the paint will be measured in place with a calibrated Type 2 magnetic film thickness gage in conformance with the requirements of specification SSPC-PA2 of the "SSPC: The Society for Protective Coatings."

SECTION 75: MISCELLANEOUS METAL

Issue Date: December 31, 2001

The table in the tenth paragraph of Section 75-1.02, "Miscellaneous Iron and Steel," of the Standard Specifications is amended to read:

Material	Specification
Steel bars, plates and shapes	ASTM Designation: A 36/A 36M or A 575, A 576 (AISI or M Grades 1016 through 1030 except Grade 1017)
Steel fastener components for general applications:	
Bolts and studs	ASTM Designation: A 307
Headed anchor bolts	ASTM Designation: A 307, Grade B, including S1 supplementary requirements
Nonheaded anchor bolts	ASTM Designation: A 307, Grade C, including S1 supplementary requirements and S1.6 of AASHTO Designation: M 314 supplementary requirements or AASHTO Designation: M 314, Grade 36 or 55, including S1 supplementary requirements
High-strength bolts and studs, threaded rods, and nonheaded anchor bolts	ASTM Designation: A 449, Type 1
Nuts	ASTM Designation: A 563, including Appendix X1*
Washers	ASTM Designation: F 844
Components of high-strength steel fastener assemblies for use in structural steel joints:	
Bolts	ASTM Designation: A 325, Type 1
Tension control bolts	ASTM Designation: F 1852, Type 1
Nuts	ASTM Designation: A 563, including Appendix X1*
Hardened washers	ASTM Designation: F 436, Type 1, Circular, including S1 supplementary requirements
Direct tension indicators	ASTM Designation: F 959, Type 325, zinc-coated
Stainless steel fasteners (Alloys 304 & 316) for general applications:	
Bolts, screws, studs, threaded rods, and nonheaded anchor bolts	ASTM Designation: F 593 or F 738M
Nuts	ASTM Designation: F 594 or F 836M
Washers	ASTM Designation: A 240/A 240M and ANSI B 18.22M
Carbon-steel castings	ASTM Designation: A 27/A 27M, Grade 65-35 [450-240], Class 1
Malleable iron castings	ASTM Designation: A 47, Grade 32510 or A 47M, Grade 22010
Gray iron castings	ASTM Designation: A 48, Class 30B
Ductile iron castings	ASTM Designation: A 536, Grade 65-45-12
Cast iron pipe	Commercial quality
Steel pipe	Commercial quality, welded or extruded
Other parts for general applications	Commercial quality

* Zinc-coated nuts that will be tightened beyond snug or wrench tight shall be furnished with a dyed dry lubricant conforming to Supplementary Requirement S2 in ASTM Designation: A 563.

The table in the eighteenth paragraph of Section 75-1.03, "Miscellaneous Bridge Metal," of the Standard Specifications is amended to read:

Stud Diameter (millimeters)	Sustained Tension Test Load (kilonewtons)
29.01-33.00	137.9
23.01-29.00	79.6
21.01-23.00	64.1
* 18.01-21.00	22.2
15.01-18.00	18.2
12.01-15.00	14.2
9.01-12.00	9.34
6.00-9.00	4.23

* Maximum stud diameter permitted for mechanical expansion anchors.

The table in the nineteenth paragraph of Section 75-1.03, "Miscellaneous Bridge Metal," of the Standard Specifications is amended to read:

Stud Diameter (millimeters)	Ultimate Tensile Load (kilonewtons)
30.01-33.00	112.1
27.01-30.00	88.1
23.01-27.00	71.2
20.01-23.00	51.6
16.01-20.00	32.0
14.01-16.00	29.4
12.00-14.00	18.7

The table in the twenty-second paragraph of Section 75-1.03, "Miscellaneous Bridge Metal," of the Standard Specifications is amended to read:

Installation Torque Values, (newton meters)

Stud Diameter (millimeters)	Shell Type Mechanical Expansion Anchors	Integral Stud Type Mechanical Expansion Anchors	Resin Capsule Anchors and Cast-in-Place Inserts
29.01-33.00	—	—	540
23.01-29.00	—	—	315
21.01-23.00	—	—	235
18.01-21.00	110	235	200
15.01-18.00	45	120	100
12.01-15.00	30	65	40
9.01-12.00	15	35	24
6.00-9.00	5	10	—

SECTION 83: RAILINGS AND BARRIERS

Issue Date: June 13, 2002

The ninth paragraph in Section 83-1.02B, "Metal Beam Guard Railing," of the Standard Specifications is amended to read:

- The grades and species of wood posts and blocks shall be No. 1 timbers (also known as No. 1 structural) Douglas fir or No. 1 timbers Southern yellow pine. Wood posts and blocks shall be graded in conformance with the provisions in Section 57-2, "Structural Timber," of the Standard Specifications, except allowances for shrinkage after mill cutting shall in no case exceed 5 percent of the American Lumber Standards minimum sizes, at the time of installation.

The eleventh paragraph in Section 83-1.02B, "Metal Beam Guard Railing," of the Standard Specifications is amended to read:

- Wood posts and blocks shall be pressure treated after fabrication in conformance with the provisions in Section 58, "Preservative Treatment of Lumber, Timber and Piling," of the Standard Specifications with creosote, creosote coal tar solution, creosote petroleum solution (50-50), pentachlorophenol in hydrocarbon solvent, copper naphthenate, ammoniacal copper arsenate, or ammoniacal copper zinc arsenate. In addition to the preservatives listed above, Southern yellow pine may also be pressure treated with chromated copper arsenate. When other than one of the creosote processes is used, blocks shall have a minimum retention of 6.4 Kg/m^3, and need not be incised.

SECTION 85: PAVEMENT MARKERS

Issue Date: May 16, 2003

The second through fifth paragraphs in Section 85-1.03, "Sampling, Tolerances and Packaging," of the Standard Specifications are amended to read:

Sampling

- Twenty markers selected at random will constitute a representative sample for each lot of markers.
- The lot size shall not exceed 25000 markers.

Tolerances

- Three test specimens will be randomly selected from the sample for each test and tested in conformance with these specifications. Should any one of the 3 specimens fail to conform with the requirements in these specifications, 6 additional specimens will be tested. The failure of any one of these 6 specimens shall be cause for rejection of the entire lot or shipment represented by the sample.
- The entire sample of retroreflective pavement markers will be tested for reflectance. The failure of 10 percent or more of the original sampling shall be cause for rejection.

Section 85-1.04, "Non-Reflective Pavement Markers," of the Standard Specifications is amended to read:

85-1.04 Non-Reflective Pavement Markers

- Non-reflective pavement markers (Types A and AY) shall be, at the option of the Contractor, either ceramic or plastic conforming to these specifications.
- The top surface of the marker shall be convex with a gradual change in curvature. The top, bottom and sides shall be free of objectionable marks or discoloration that will affect adhesion or appearance.
- The bottom of markers shall have areas of integrally formed protrusions or indentations, which will increase the effective bonding surface area of adhesive. The bottom surface of the marker shall not deviate more than 1.5 mm from a flat surface. The areas of protrusion shall have faces parallel to the bottom of the marker and shall project approximately one mm from the bottom.

The second through fourth paragraphs of Section 85-1.04A, "Non-Reflective Pavement Markers (Ceramic)," of the Standard Specifications are deleted.

The table in the fifth paragraph in Section 85-1.04A, "Non-Reflective Pavement Markers (Ceramic)," of the Standard Specifications is amended to read:

Testing

- Tests shall be performed in conformance with the requirements in California Test 669.

Test	Test Description	Requirement
a	Bond strength	4.8 MPa, min.
b	Glaze thickness	180 µm, min.
c	Hardness	6 Moh, min.
d	Luminance factor, Type A, white markers only, glazed surface	75, min.
e	Yellowness index, Type A, white markers only, glazed surface	7, max.
f	Color-yellow, Type AY, yellow markers only. The chromaticity coordinates shall be within a color box defined in CTM 669	Pass
g	Compressive strength	6700 N, min.
h	Water absorption	2.0 %, max.
i	Artificial weathering, 500 hours exposure, yellowness index	20, max.

Section 85-1.04B, "Non-Reflective Pavement Markers (Plastic)," of the Standard Specifications is amended to read:

85-1.04B Non-Reflective Pavement Markers (Plastic)

- Plastic non-reflective pavement markers Types A and AY shall be, at the option of the Contractor, either polypropylene or acrylonitrile-butadiene-styrene (ABS) plastic type.
- Plastic markers shall conform to the testing requirements specified in Section 85-1.04A, "Non-Reflective Pavement Markers (Ceramic)," except that Tests a, b, c, and h shall not apply. The plastic markers shall not be coated with substances that interfere with the ability of the adhesive bonding to the marker.

The sixth and seventh paragraphs in Section 85-1.05, "Retroreflective Pavement Markers," of the Standard Specifications are amended to read:

Testing

- Tests shall be performed in conformance with the requirements in California Test 669.

Test Description	Requirement		
Bond strength[a]	3.4 MPa, min.		
Compressive strength[b]	8900 N, min.		
Abrasion resistance, marker must meet the respective specific intensity minimum requirements after abrasion.	Pass		
Water Soak Resistance	No delamination of the body or lens system of the marker nor loss of reflectance		
	Specific Intensity		
Reflectance	Clear	Yellow	Red
0° Incidence Angle, min.	3.0	1.5	0.75
20° Incidence Angle, min.	1.2	0.60	0.30
After one year field evaluation	0.30	0.15	0.08

a Failure of the marker body or filler material prior to reaching 3.4 MPa shall constitute a failing bond strength test.
b Deformation of the marker of more than 3 mm at a load of less than 8900 N or delamination of the shell and the filler material of more than 3 mm regardless of the load required to break the marker shall be cause for rejection of the markers as specified in Section 85-1.03, "Sampling, Tolerances and Packaging."

- Pavement markers to be placed in pavement recesses shall conform to the above requirements for retroreflective pavement markers except that the minimum compressive strength requirement shall be 5338 N.

The eighth paragraph of Section 85-1.05, "Retrorelective Pavement Markers" of the Standard Specifications is deleted.

The eighth paragraph in Section 85-1.06, "Replacement," of the Standard Specifications is amended to read:

- Epoxy adhesive shall not be used to apply non-reflective plastic pavement markers.

SECTION 86: SIGNALS, LIGHTING AND ELECTRICAL SYSTEMS

Issue Date: June 19, 2003

The seventh paragraph of Section 86-2.03, "Foundations," of the Standard Specifications is amended to read:

- Forms shall be true to line and grade. Tops of foundations for posts and standards, except special foundations, shall be finished to curb or sidewalk grade or as directed by the Engineer. Forms shall be rigid and securely braced in place. Conduit ends and anchor bolts shall be placed in proper position and to proper height, and anchor bolts shall be held in place by means of rigid top and bottom templates. The bottom template shall be made of steel. The bottom template shall provide proper spacing and alignment of the anchor bolts near their bottom embedded end. The bottom template shall be installed before placing footing concrete. Anchor bolts shall not be installed more than 1:40 from vertical.

Section 86-2.03, "Foundations," of the Standard Specifications is amended by deleting the eighth paragraph.

The twelfth paragraph of Section 86-2.03, "Foundations," of the Standard Specifications is amended to read:

- Plumbing of the standards shall be accomplished by adjusting the leveling nuts before placing the mortar or before the foundation is finished to final grade. Shims, or other similar devices shall not be used for plumbing or raking of posts, standards or pedestals. After final adjustments of both top nuts and leveling nuts on anchorage assemblies have been made, firm contact shall exist between all bearing surfaces of the anchor bolt nuts, washers, and the base plate.

The first paragraph of Section 86-2.04, "Standards, Steel Pedestals and Posts," of the Standard Specifications is amended to read:

- Standards for traffic signals and lighting, and steel pedestals for cabinets and other similar equipment, shall be located as shown on the plans. Bolts, nuts and washers, and anchor bolts for use in signal and lighting support structures shall conform to the provisions in Section 55-2, "Materials." Except when bearing-type connections or slipbases are specified, high-strength bolted connections shall conform to the provisions in Section 55-3.14, "Bolted Connections." Welding, nondestructive testing (NDT) of welds, and acceptance and repair criteria for NDT of steel members shall conform to the requirements of AWS D1.1 and the contract special provisions.

The second paragraph of Section 86-2.04, "Standards, Steel Pedestals and Posts," of the Standard Specifications is amended to read:

- On each lighting standard except Type 1, one rectangular corrosion resistant metal identification tag shall be permanently attached above the hand hole, near the base of the standard, using stainless steel rivets. On each signal pole support, two corrosion resistant metal identification tags shall be attached, one above the hand hole near the base of the vertical standard and one on the underside of the signal mast arm near the arm plate. As a minimum, the information on each identification tag shall include the name of the manufacturer, the date of manufacture, the identification number as shown on the plans, the contract number, and a unique identification code assigned by the fabricator. This number shall be traceable to a particular contract and the welds on that component, and shall be readable after the support structure is coated and installed. The lettering shall be a minimum of 7 mm high. The information may be either depressed or raised, and shall be legible.

The fourth paragraph of Section 86-2.04, "Standards, Steel Pedestals and Posts" of the Standard Specifications is amended to read:

- Ferrous metal parts of standards, with shaft length of 4.6 m and longer, shall conform to the details shown on the plans, the provisions in Section 55, "Steel Structures," except as otherwise noted, and the following requirements:

Except as otherwise specified, standards shall be fabricated from sheet steel of weldable grade having a minimum yield strength, after fabrication, of 276 MPa.

Certified test reports which verify conformance to the minimum yield strength requirements shall be submitted to the Engineer. The test reports may be the mill test reports for the as-received steel or, when the as-received steel has a lower yield strength than required, the Contractor shall provide supportive test data which provides assurance that the Contractor's method of cold forming will consistently increase the tensile properties of the steel to meet the specified minimum yield strength. The supportive test data shall include tensile properties of the steel after cold forming for specific heats and thicknesses.

When a single-ply 8-mm thick pole is specified, a 2-ply pole with equivalent section modulus may be substituted.

Standards may be fabricated of full-length sheets or shorter sections. Each section shall be fabricated from not more than 2 pieces of sheet steel. Where 2 pieces are used, the longitudinal welded seams shall be directly opposite one another. When the sections are butt-welded together, the longitudinal welded seams on adjacent sections shall be placed to form continuous straight seams from base to top of standard.

Butt-welded circumferential joints of tubular sections requiring CJP groove welds shall be made using a metal sleeve backing ring inside each joint. The sleeve shall be 3-mm nominal thickness, or thicker, and manufactured from steel having the same chemical composition as the steel in the tubular sections to be joined. When the sections to be joined have different specified minimum yield strengths, the steel in the sleeve shall have the same chemical composition as the tubular section having the higher minimum yield strength. The width of the metal sleeve shall be consistent with the type of NDT chosen and shall be a minimum width of 25 mm. The sleeve shall be centered at the joint and be in contact with the tubular section at the point of the weld at time of fit-up.

Welds shall be continuous.

The weld metal at the transverse joint shall extend to the sleeve, making the sleeve an integral part of the joint.

During fabrication, longitudinal seams on vertical tubular members of cantilevered support structures shall be centered on and along the side of the pole that the pole plate is located. Longitudinal seams on horizontal tubular members, including signal and luminaire arms, shall be within +/-45 degrees of the bottom of the arm.

The longitudinal welds in steel tubular sections may be made by the electric resistance welding process.

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

Exposed circumferential welds, except fillet and fatigue-resistant welds, shall be ground flush (-0, +2mm) with the base metal prior to galvanizing or painting.

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

Exposed edges of the plates that make up the base assembly shall be finished smooth and exposed corners of the plates shall be broken unless otherwise shown on the plans. Shafts shall be provided with slip-fitter shaft caps.

Flatness of surfaces of 1) base plates that are to come in contact with concrete, grout, or washers and leveling nuts 2) plates in high-strength bolted connections, 3) plates in joints where cap screws are used to secure luminaire and signal arms, and 4) plates used for breakaway slip base assemblies shall conform to the requirements of ASTM A6.

Standards shall be straight, with a permissive variation not to exceed 25 mm measured at the midpoint of a 9-m or 11-m standard and not to exceed 20 mm measured at the midpoint of a 5-m through 6-m standard. Variation shall not exceed 25 mm at a point 4.5 m above the base plate for Type 35 and Type 36 standards.

Zinc-coated nuts used on fastener assemblies having a specified preload (obtained by specifying a prescribed tension, torque value, or degree of turn) shall be provided with a colored lubricant that is clean and dry to the touch. The color of the lubricant shall be in contrast to the zinc coating on the nut so that the presence of the lubricant is visually obvious. In addition, either the lubricant shall be insoluble in water, or fastener components shall be shipped to the job site in a sealed container.

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

Standards with an outside diameter of 300 mm or less shall be round. Standards with an outside diameter greater than 300 mm shall be round or multisided. Multisided standards shall have a minimum of 12 sides which shall be convex and shall have a minimum bend radius of 100 mm.

Mast arms for standards shall be fabricated from material as specified for standards, and shall conform to the dimensions shown on the plans.

The cast steel option for slip bases shall be fabricated from material conforming to the requirements in ASTM Designation: A 27/A 27M, Grade 70-40. Other comparable material may be used if written permission is given by the Engineer. The casting tolerances shall be in conformance with the Steel Founder's Society of America recommendations (green sand molding).

One casting from each lot of 50 castings or less shall be subject to radiographic inspection, in conformance with the requirements in ASTM Designation: E 94. The castings shall comply with the acceptance criteria severity level 3 or better for the types and categories of discontinuities in conformance with the requirements in ASTM Designations: E 186 and E 446. If the one casting fails to pass the inspection, 2 additional castings shall be radiographed. Both of these castings shall pass the inspection or the entire lot of 50 will be rejected.

Material certifications, consisting of physical and chemical properties, and radiographic films of the castings shall be filed at the manufacturer's office. These certifications and films shall be available for inspection upon request.

High-strength bolts, nuts and flat washers used to connect slip base plates shall conform to the requirements in ASTM Designation: A 325 or A 325M and shall be galvanized in conformance with the provisions in Section 75-1.05, "Galvanizing."

Plate washers shall be fabricated by saw cutting and drilling steel plate conforming to the requirements in AISI Designation: 1018, and be galvanized in conformance with the provisions in Section 75-1.05, "Galvanizing." Prior to galvanizing, burrs and sharp edges shall be removed and holes shall be chamfered sufficiently on each side to allow the bolt head to make full contact with the washer without tension on the bolt.

High-strength cap screws shown on the plans for attaching arms to standards shall conform to the requirements in ASTM Designation: A 325, A 325M or ASTM Designation: A 449, and shall comply with the mechanical requirements in ASTM Designation: A 325 or A 325M after galvanizing. The cap screws shall be galvanized in conformance with the provisions in Section 75-1.05, "Galvanizing." The threads of the cap screws shall be coated with a colored lubricant that is clean and dry to the touch. The color of the lubricant shall be in contrast to the color of the zinc coating on the cap screw so that presence of the lubricant is visually obvious. In addition, either the lubricant shall be insoluble in water, or fastener components shall be shipped to the job site in a sealed container.

Unless otherwise specified, bolted connections attaching signal or luminaire arms to poles shall be considered slip critical. Galvanized faying surfaces on plates on luminaire and signal arms and matching plate surfaces on poles shall be roughened by hand using a wire brush prior to assembly and shall conform to the requirements for Class C surface conditions for slip-critical connections in "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts," a specification approved by the Research Council on Structural Connections (RCSC) of the Engineering Foundation. For faying surfaces required to be painted, the paint shall be an approved type, brand, and thickness that has been tested and approved according to the RCSC Specification as a Class B coating.

Samples of fastener components will be randomly taken from each production lot by the Engineer and submitted, along with test reports required by appropriate ASTM fastener specifications, for QA testing and evaluation. Sample sizes for each fastener component shall be as determined by the Engineer.

The seventh paragraph of 86-2.04, "Standards, Steel Pedestals and Posts" of the Standard Specifications is amended to read:

- To avoid interference of arm plate-to-tube welds with cap screw heads, and to ensure cap screw heads can be turned using conventional installation tools, fabricators shall make necessary adjustments to details prior to fabrication and properly locate the position of arm tubes on arm plates during fabrication.

Section 86-8.01, "Payment," of the Standard Specifications is amended by adding the following paragraph after the first paragraph:

- If a portion or all of the poles for signal, lighting and electrical systems pursuant to Standard Specification Section 86, "Signals, Lighting and Electrical Systems," is fabricated more than 480 air line kilometers from both Sacramento and Los Angeles, additional shop inspection expenses will be sustained by the State. Whereas it is and will be impracticable and extremely difficult to ascertain and determine the actual increase in such expenses, it is agreed that payment to the Contractor for furnishing such items from each fabrication site located more than 480 air line kilometers from both Sacramento and Los Angeles will be reduced $5000; in addition, in the case where a fabrication site is located more than 4800 air line kilometers from both Sacramento and Los Angeles, payment will be reduced an additional $3000 per each fabrication site ($8000 total per site).

SECTION 88: ENGINEERING FABRIC

Issue Date: January 15, 2002

Section 88-1.02, "Pavement Reinforcing Fabric," of the Standard Specifications is amended to read:

• Pavement reinforcing fabric shall be 100 percent polypropylene staple fiber fabric material, needle-punched, thermally bonded on one side, and conform to the following:

Specification	Requirement
Weight, grams per square meter ASTM Designation: D 5261	140
Grab tensile strength (25-mm grip), kilonewtons, min. in each direction ASTM Designation: D 4632	0.45
Elongation at break, percent min. ASTM Designation: D 4632	50
Asphalt retention by fabric, grams per square meter. (Residual Minimum) ASTM Designation: D 6140	900

Note: Weight, grab, elongation and asphalt retention are based on Minimum Average Roll Value (MARV)

SECTION 90: PORTLAND CEMENT CONCRETE

Issue Date: June 19, 2003

Section 90, "Portland Cement Concrete," of the Standard Specifications is amended to read:

SECTION 90: PORTLAND CEMENT CONCRETE
90-1 GENERAL

90-1.01 DESCRIPTION

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

• The Contractor shall determine the mix proportions for concrete in conformance with these specifications. Unless otherwise specified, cementitious material shall be a combination of cement and mineral admixture. Cementitious material shall be either:

1. "Type IP (MS) Modified" cement; or
2. A combination of "Type II Modified" portland cement and mineral admixture; or
3. A combination of Type V portland cement and mineral admixture.

• Type III portland cement shall be used only as allowed in the special provisions or with the approval of the Engineer.

• Class 1 concrete shall contain not less than 400 kg of cementitious material per cubic meter.

• Class 2 concrete shall contain not less than 350 kg of cementitious material per cubic meter.

• Class 3 concrete shall contain not less than 300 kg of cementitious material per cubic meter.

• Class 4 concrete shall contain not less than 250 kg of cementitious material per cubic meter.

• Minor concrete shall contain not less than 325 kg of cementitious material per cubic meter unless otherwise specified in these specifications or the special provisions.

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

Use	Cementitious Material Content (kg/m3)
Concrete designated by compressive strength:	
Deck slabs and slab spans of bridges	400 min., 475 max.
Roof sections of exposed top box culverts	400 min., 475 max.
Other portions of structures	350 min., 475 max.
Concrete not designated by compressive strength:	
Deck slabs and slab spans of bridges	400 min.
Roof sections of exposed top box culverts	400 min.
Prestressed members	400 min.
Seal courses	400 min.
Other portions of structures	350 min.
Concrete for precast members	350 min., 550 max.

• Whenever the 28-day compressive strength shown on the plans is greater than 25 MPa, the concrete shall be designated by compressive strength. If the plans show a 28-day compressive strength that is 28 MPa or greater, an additional 14 days will be allowed to obtain the specified strength. The 28-day compressive strengths shown on the plans that are 25 MPa or less are shown for design information only and are not a requirement for acceptance of the concrete.

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

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

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

• If any concrete has a cementitious material, portland cement, or mineral admixture content that is less than the minimum required, the concrete shall be removed. However, if the Engineer determines that the concrete is structurally adequate, the concrete may remain in place and the Contractor shall pay to the State $0.55 for each kilogram of cementitious material, portland cement, or mineral admixture that is less than the minimum required. The Department may deduct the amount from any moneys due, or that may become due, the Contractor under the contract. The deductions will not be made unless the difference between the contents required and those actually provided exceeds the batching tolerances permitted by Section 90-5, "Proportioning." No deductions will be made based on the results of California Test 518.

• The requirements of the preceding paragraph shall not apply to minor concrete or commercial quality concrete.

90-2 MATERIALS

90-2.01 CEMENT

• Unless otherwise specified, cement shall be either "Type IP (MS) Modified" cement, "Type II Modified" portland cement or Type V portland cement.

• "Type IP (MS) Modified" cement shall conform to the requirements for Type IP (MS) cement in ASTM Designation: C 595, and shall be comprised of an intimate and uniform blend of Type II cement and not more than 35 percent by mass of mineral admixture. The type and minimum amount of mineral admixture used in the manufacture of "Type IP (MS) Modified" cement shall be in conformance with the provisions in Section 90-4.08, "Required Use of Mineral Admixtures."

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

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

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

when cement is to be used for precast prestressed concrete piling, precast prestressed concrete members, or steam cured concrete products, the mortar shall not contract in air more than 0.053 percent.

- Type III and Type V portland cements shall conform to the requirements in ASTM Designation: C 150 and the additional requirements listed above for "Type II Modified" portland cement, except that when tested in conformance with California Test 527, mortar containing Type III portland cement shall not contract in air more than 0.075 percent.
- Cement used in the manufacture of cast-in-place concrete for exposed surfaces of like elements of a structure shall be from the same cement mill.
- Cement shall be protected from exposure to moisture until used. Sacked cement shall be piled to permit access for tally, inspection, and identification of each shipment.
- Adequate facilities shall be provided to assure that cement meeting the provisions specified in this Section 90-2.01 shall be kept separate from other cement in order to prevent any but the specified cement from entering the work. Safe and suitable facilities for sampling cement shall be provided at the weigh hopper or in the feed line immediately in advance of the hopper, in conformance with California Test 125.
- If cement is used prior to sampling and testing as provided in Section 6-1.07, "Certificates of Compliance," and the cement is delivered directly to the site of the work, the Certificate of Compliance shall be signed by the cement manufacturer or supplier of the cement. If the cement is used in ready-mixed concrete or in precast concrete products purchased as such by the Contractor, the Certificate of Compliance shall be signed by the manufacturer of the concrete or product.
- Cement furnished without a Certificate of Compliance shall not be used in the work until the Engineer has had sufficient time to make appropriate tests and has approved the cement for use.

90-2.02 AGGREGATES

- Aggregates shall be free from deleterious coatings, clay balls, roots, bark, sticks, rags, and other extraneous material.
- Natural aggregates shall be thoroughly and uniformly washed before use.
- The Contractor, at the Contractor's expense, shall provide safe and suitable facilities, including necessary splitting devices for obtaining samples of aggregates, in conformance with California Test 125.
- Aggregates shall be of such character that it will be possible to produce workable concrete within the limits of water content provided in Section 90-6.06, "Amount of Water and Penetration."
- Aggregates shall have not more than 10 percent loss when tested for soundness in conformance with the requirements in California Test 214. The soundness requirement for fine aggregate will be waived, provided that the durability index, D_f, of the fine aggregate is 60, or greater, when tested for durability in conformance with California Test 229.
- If the results of any one or more of the Cleanness Value, Sand Equivalent, or aggregate grading tests do not meet the requirements specified for "Operating Range" but all meet the "Contract Compliance" requirements, the placement of concrete shall be suspended at the completion of the current pour until tests or other information indicate that the next material to be used in the work will comply with the requirements specified for "Operating Range."
- If the results of either or both the Cleanness Value and coarse aggregate grading tests do not meet the requirements specified for "Contract Compliance," the concrete that is represented by the tests shall be removed. However, if the Engineer determines that the concrete is structurally adequate, the concrete may remain in place, and the Contractor shall pay to the State $4.60 per cubic meter for paving concrete and $7.20 per cubic meter for all other concrete for the concrete represented by these tests and left in place. The Department may deduct the amount from any moneys due, or that may become due, the Contractor under the contract.
- If the results of either or both the Sand Equivalent and fine aggregate grading tests do not meet the requirements specified for "Contract Compliance," the concrete which is represented by the tests shall be removed. However, if the Engineer determines that the concrete is structurally adequate, the concrete may remain in place, and the Contractor shall pay to the State $4.60 per cubic meter for paving concrete and $7.20 per cubic meter for all other concrete for the concrete represented by these tests and left in place. The Department may deduct the amount from any moneys due, or that may become due, the Contractor under the contract.
- The 2 preceding paragraphs apply individually to the "Contract Compliance" requirements for coarse aggregate and fine aggregate. When both coarse aggregate and fine aggregate do not conform to the "Contract Compliance" requirements, both paragraphs shall apply. The payments specified in those paragraphs shall be in addition to any payments made in conformance with the provisions in Section 90-1.01, "Description."
- No single Cleanness Value, Sand Equivalent or aggregate grading test shall represent more than 250 m^3 of concrete or one day's pour, whichever is smaller.
- When the source of an aggregate is changed, the Contractor shall adjust the mix proportions and submit in writing to the Engineer a copy of the mix design before using the aggregates.

90-2.02A Coarse Aggregate

• Coarse aggregate shall consist of gravel, crushed gravel, crushed rock, crushed air-cooled iron blast furnace slag or combinations thereof. Crushed air-cooled blast furnace slag shall not be used in reinforced or prestressed concrete.

• Coarse aggregate shall conform to the following quality requirements:

Tests	California Test	Requirements
Loss in Los Angeles Rattler (after 500 revolutions)	211	45% max.
Cleanness Value		
Operating Range	227	75 min.
Contract Compliance	227	71 min.

• In lieu of the above Cleanness Value requirements, a Cleanness Value "Operating Range" limit of 71, minimum, and a Cleanness Value "Contract Compliance" limit of 68, minimum, will be used to determine the acceptability of the coarse aggregate if the Contractor furnishes a Certificate of Compliance, as provided in Section 6-1.07, "Certificates of Compliance," certifying that:

1. coarse aggregate sampled at the completion of processing at the aggregate production plant had a Cleanness Value of not less than 82 when tested by California Test 227; and
2. prequalification tests performed in conformance with the requirements in California Test 549 indicated that the aggregate would develop a relative strength of not less than 95 percent and would have a relative shrinkage not greater than 105 percent, based on concrete.

90-2.02B Fine Aggregate

• Fine aggregate shall consist of natural sand, manufactured sand produced from larger aggregate or a combination thereof. Manufactured sand shall be well graded.

• Fine aggregate shall conform to the following quality requirements:

Test	California Test	Requirements
Organic Impurities	213	Satisfactory[a]
Mortar Strengths Relative to Ottawa Sand	515	95%, min.
Sand Equivalent:		
Operating Range	217	75, min.
Contract Compliance	217	71, min.

a Fine aggregate developing a color darker than the reference standard color solution may be accepted if it is determined by the Engineer, from mortar strength tests, that a darker color is acceptable.

• In lieu of the above Sand Equivalent requirements, a Sand Equivalent "Operating Range" limit of 71 minimum and a Sand Equivalent "Contract Compliance" limit of 68 minimum will be used to determine the acceptability of the fine aggregate if the Contractor furnishes a Certificate of Compliance, as provided in Section 6-1.07, "Certificates of Compliance," certifying that:

1. fine aggregate sampled at the completion of processing at the aggregate production plant had a Sand Equivalent value of not less than 82 when tested by California Test 217; and
2. prequalification tests performed in conformance with California Test 549 indicated that the aggregate would develop a relative strength of not less than 95 percent and would have a relative shrinkage not greater than 105 percent, based on concrete.

90-2.03 WATER

• In conventionally reinforced concrete work, the water for curing, for washing aggregates, and for mixing shall be free from oil and shall not contain more than 1000 parts per million of chlorides as Cl, when tested in conformance with

California Test 422, nor more than 1300 parts per million of sulfates as SO_4, when tested in conformance with California Test 417. In prestressed concrete work, the water for curing, for washing aggregates, and for mixing shall be free from oil and shall not contain more than 650 parts per million of chlorides as Cl, when tested in conformance with California Test 422, nor more than 1300 parts per million of sulfates as SO_4, when tested in conformance with California Test 417. In no case shall the water contain an amount of impurities that will cause either: 1) a change in the setting time of cement of more than 25 percent when tested in conformance with the requirements in ASTM Designation: C 191 or ASTM Designation: C 266 or 2) a reduction in the compressive strength of mortar at 14 days of more than 5 percent, when tested in conformance with the requirements in ASTM Designation: C 109, when compared to the results obtained with distilled water or deionized water, tested in conformance with the requirements in ASTM Designation: C 109.

- In non-reinforced concrete work, the water for curing, for washing aggregates and for mixing shall be free from oil and shall not contain more than 2000 parts per million of chlorides as Cl, when tested in conformance with California Test 422, or more than 1500 parts per million of sulfates as SO_4, when tested in conformance with California Test 417.
- In addition to the above provisions, water for curing concrete shall not contain impurities in a sufficient amount to cause discoloration of the concrete or produce etching of the surface.
- Water reclaimed from mixer wash-out operations may be used in mixing concrete. The water shall not contain coloring agents or more than 300 parts per million of alkalis (Na_2O + 0.658 K_2O) as determined on the filtrate. The specific gravity of the water shall not exceed 1.03 and shall not vary more than ±0.010 during a day's operations.

90-2.04 ADMIXTURE MATERIALS

- Admixture materials shall conform to the requirements in the following ASTM Designations:

A. Chemical Admixtures—ASTM Designation: C 494.
B. Air-entraining Admixtures—ASTM Designation: C 260.
C. Calcium Chloride—ASTM Designation: D 98.
D. Mineral Admixtures—Coal fly ash; raw or calcined natural pozzolan as specified in ASTM Designation: C 618; silica fume conforming to the requirements in ASTM Designation: C 1240, with reduction of mortar expansion of 80 percent, minimum, using the cement from the proposed mix design.

- Unless otherwise specified in the special provisions, mineral admixtures shall be used in conformance with the provisions in Section 90-4.08, "Required Use of Mineral Admixtures."

90-3 AGGREGATE GRADINGS

90-3.01 GENERAL

- Before beginning concrete work, the Contractor shall submit in writing to the Engineer the gradation of the primary aggregate nominal sizes that the Contractor proposes to furnish. If a primary coarse aggregate or the fine aggregate is separated into 2 or more sizes, the proposed gradation shall consist of the gradation for each individual size, and the proposed proportions of each individual size, combined mathematically to indicate one proposed gradation. The proposed gradation shall meet the grading requirements shown in the table in this section, and shall show the percentage passing each of the sieve sizes used in determining the end result.
- The Engineer may waive, in writing, the gradation requirements in this Section 90-3.01 and in Sections 90-3.02, "Coarse Aggregate Grading," 90-3.03, "Fine Aggregate Grading," and 90-3.04, "Combined Aggregate Gradings," if, in the Engineer's opinion, furnishing the gradation is not necessary for the type or amount of concrete work to be constructed.
- Gradations proposed by the Contractor shall be within the following percentage passing limits:

Primary Aggregate Nominal Size	Sieve Size	Limits of Proposed Gradation
37.5-mm x 19-mm	25-mm	19 - 41
25-mm x 4.75-mm	19-mm	52 - 85
25-mm x 4.75-mm	9.5-mm	15 - 38
12.5-mm x 4.75-mm	9.5-mm	40 - 78
9.5-mm x 2.36-mm	9.5-mm	50 - 85
Fine Aggregate	1.18-mm	55 - 75
Fine Aggregate	600-µm	34 - 46
Fine Aggregate	300-µm	16 - 29

- Should the Contractor change the source of supply, the Contractor shall submit in writing to the Engineer the new gradations before their intended use.

90-3.02 COARSE AGGREGATE GRADING

- The grading requirements for coarse aggregates are shown in the following table for each size of coarse aggregate:

	Percentage Passing Primary Aggregate Nominal Sizes							
	37.5-mm x 19-mm		25-mm x 4.75-mm		12.5-mm x 4.75-mm		9.5-mm x 2.36-mm	
Sieve Sizes	Operating Range	Contract Compliance	Operating Range	Contract Compliance	Operating Range	Contract Compliance	Operating Range	Contract Compliance
50-mm	100	100	—	—	—	—	—	—
37.5-mm	88-100	85-100	100	100	—	—	—	—
25-mm	x ± 18	X ± 25	88-100	86-100	—	—	—	—
19-mm	0-17	0-20	X ± 15	X ± 22	100	100	—	—
12.5-mm	—	—	—	—	82-100	80-100	100	100
9.5-mm	0-7	0-9	X ± 15	X ± 22	X ± 15	X ± 22	X ± 15	X ± 20
4.75-mm	—	—	0-16	0-18	0-15	0-18	0-25	0-28
2.36-mm	—	—	0-6	0-7	0-6	0-7	0-6	0-7

- In the above table, the symbol X is the gradation that the Contractor proposes to furnish for the specific sieve size as provided in Section 90-3.01, "General."
- Coarse aggregate for the 37.5-mm, maximum, combined aggregate grading as provided in Section 90-3.04, "Combined Aggregate Gradings," shall be furnished in 2 or more primary aggregate nominal sizes. Each primary aggregate nominal size may be separated into 2 sizes and stored separately, provided that the combined material conforms to the grading requirements for that particular primary aggregate nominal size.
- When the 25-mm, maximum, combined aggregate grading as provided in Section 90-3.04, "Combined Aggregate Gradings," is to be used, the coarse aggregate may be separated into 2 sizes and stored separately, provided that the combined material shall conform to the grading requirements for the 25-mm x 4.75-mm primary aggregate nominal size.

90-3.03 FINE AGGREGATE GRADING

- Fine aggregate shall be graded within the following limits:

	Percentage Passing	
Sieve Sizes	Operating Range	Contract Compliance
9.5-mm	100	100
4.75-mm	95-100	93-100
2.36-mm	65-95	61-99
1.18-mm	X ± 10	X ± 13
600-µm	X ± 9	X ± 12
300-µm	X ± 6	X ± 9
150-µm	2-12	1-15
75-µm	0-8	0-10

• In the above table, the symbol X is the gradation that the Contractor proposes to furnish for the specific sieve size as provided in Section 90-3.01, "General."

• In addition to the above required grading analysis, the distribution of the fine aggregate sizes shall be such that the difference between the total percentage passing the 1.18-mm sieve and the total percentage passing the 600-µm sieve shall be between 10 and 40, and the difference between the percentage passing the 600-µm and 300-µm sieves shall be between 10 and 40.

• Fine aggregate may be separated into 2 or more sizes and stored separately, provided that the combined material conforms to the grading requirements specified in this Section 90-3.03.

90-3.04 COMBINED AGGREGATE GRADINGS

• Combined aggregate grading limits shall be used only for the design of concrete mixes. Concrete mixes shall be designed so that aggregates are combined in proportions that shall produce a mixture within the grading limits for combined aggregates as specified herein. Within these limitations, the relative proportions shall be as ordered by the Engineer, except as otherwise provided in Section 90-1.01, "Description."

• The combined aggregate grading, except when otherwise specified in these specifications or the special provisions, shall be either the 37.5-mm, maximum grading, or the 25-mm, maximum grading, at the option of the Contractor.

Grading Limits of Combined Aggregates

Sieve Sizes	Percentage Passing			
	37.5-mm Max.	25-mm Max.	12.5-mm Max.	9.5-mm Max.
50-mm	100	—	—	—
37.5-mm	90-100	100	—	—
25-mm	50-86	90-100	—	—
19-mm	45-75	55-100	100	—
12.5-mm	—	—	90-100	100
9.5-mm	38-55	45-75	55-86	50 - 100
4.75-mm	30-45	35-60	45-63	45 - 63
2.36-mm	23-38	27-45	35-49	35 - 49
1.18-mm	17-33	20-35	25-37	25 - 37
600-µm	10-22	12-25	15-25	15 - 25
300-µm	4-10	5-15	5-15	5 - 15
150-µm	1-6	1-8	1-8	1 - 8
75-µm	0-3	0-4	0-4	0 - 4

• Changes from one grading to another shall not be made during the progress of the work unless permitted by the Engineer.

90-4 ADMIXTURES

90-4.01 GENERAL

• Admixtures used in portland cement concrete shall conform to and be used in conformance with the provisions in this Section 90-4 and the special provisions. Admixtures shall be used when specified or ordered by the Engineer and may be used at the Contractor's option as provided herein.

• Chemical admixtures and air-entraining admixtures containing chlorides as Cl in excess of one percent by mass of admixture, as determined by California Test 415, shall not be used in prestressed or reinforced concrete.

• Calcium chloride shall not be used in concrete except when otherwise specified.

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

• Admixtures shall be uniform in properties throughout their use in the work. Should it be found that an admixture as furnished is not uniform in properties, its use shall be discontinued.

• If more than one admixture is used, the admixtures shall be compatible with each other so that the desirable effects of all admixtures used will be realized.

90-4.02 MATERIALS

• Admixture materials shall conform to the provisions in Section 90–2.04, "Admixture Materials."

90-4.03 ADMIXTURE APPROVAL

• No admixture brand shall be used in the work unless it is on the Department's current list of approved brands for the type of admixture involved.

• Admixture brands will be considered for addition to the approved list if the manufacturer of the admixture submits to the Transportation Laboratory a sample of the admixture accompanied by certified test results demonstrating that the admixture complies with the requirements in the appropriate ASTM Designation and these specifications. The sample shall be sufficient to permit performance of all required tests. Approval of admixture brands will be dependent upon a determination as to compliance with the requirements, based on the certified test results submitted, together with tests the Department may elect to perform.

• When the Contractor proposes to use an admixture of a brand and type on the current list of approved admixture brands, the Contractor shall furnish a Certificate of Compliance from the manufacturer, as provided in Section 6-1.07, "Certificates of Compliance," certifying that the admixture furnished is the same as that previously approved. If a previously approved admixture is not accompanied by a Certificate of Compliance, the admixture shall not be used in the work until the Engineer has had sufficient time to make the appropriate tests and has approved the admixture for use. The Engineer may take samples for testing at any time, whether or not the admixture has been accompanied by a Certificate of Compliance.

• If a mineral admixture is delivered directly to the site of the work, the Certificate of Compliance shall be signed by the manufacturer or supplier of the mineral admixture. If the mineral admixture is used in ready-mix concrete or in precast concrete products purchased as such by the Contractor, the Certificate of Compliance shall be signed by the manufacturer of the concrete or product.

90-4.04 REQUIRED USE OF CHEMICAL ADMIXTURES AND CALCIUM CHLORIDE

• When the use of a chemical admixture or calcium chloride is specified, the admixture shall be used at the dosage specified, except that if no dosage is specified, the admixture shall be used at the dosage normally recommended by the manufacturer of the admixture.

• Calcium chloride shall be dispensed in liquid, flake, or pellet form. Calcium chloride dispensed in liquid form shall conform to the provisions for dispensing liquid admixtures in Section 90-4.10, "Proportioning and Dispensing Liquid Admixtures."

90-4.05 OPTIONAL USE OF CHEMICAL ADMIXTURES

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

A. When a water-reducing admixture or a water-reducing and retarding admixture is used, the cementitious material content specified or ordered may be reduced by a maximum of 5 percent by mass, except that the resultant cementitious material content shall be not less than 300 kilograms per cubic meter; and
B. When a reduction in cementitious material content is made, the dosage of admixture used shall be the dosage used in determining approval of the admixture.

• Unless otherwise specified, a Type C accelerating chemical admixture conforming to the requirements in ASTM Designation: C 494, may be used in portland cement concrete. Inclusion in the mix design submitted for approval will not be required provided that the admixture is added to counteract changing conditions that contribute to delayed setting of the portland cement concrete, and the use or change in dosage of the admixture is approved in writing by the Engineer.

90-4.06 REQUIRED USE OF AIR-ENTRAINING ADMIXTURES

• When air-entrainment is specified or ordered by the Engineer, the air-entraining admixture shall be used in amounts to produce a concrete having the specified air content as determined by California Test 504.

90-4.07 OPTIONAL USE OF AIR-ENTRAINING ADMIXTURES

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

90-4.08 REQUIRED USE OF MINERAL ADMIXTURES

- Unless otherwise specified, mineral admixture shall be combined with cement to make cementitious material.
- The calcium oxide content of mineral admixtures shall not exceed 10 percent and the available alkali, as sodium oxide equivalent, shall not exceed 1.5 percent when determined in conformance with the requirements in ASTM Designation: C 618.
- The amounts of cement and mineral admixture used in cementitious material shall be sufficient to satisfy the minimum cementitious material content requirements specified in Section 90-1.01, "Description," or Section 90-4.05, "Optional Use of Chemical Admixtures," and shall conform to the following:

A. The minimum amount of cement shall not be less than 75 percent by mass of the specified minimum cementitious material content;
B. The minimum amount of mineral admixture to be combined with cement shall be determined using one of the following criteria:

   1. When the calcium oxide content of a mineral admixture is equal to or less than 2 percent by mass, the amount of mineral admixture shall not be less than 15 percent by mass of the total amount of cementitious material to be used in the mix;
   2. When the calcium oxide content of a mineral admixture is greater than 2 percent, the amount of mineral admixture shall not be less than 25 percent by mass of the total amount of cementitious material to be used in the mix;
   3. When a mineral admixture that conforms to the provisions for silica fume in Section 90-2.04, "Admixture Materials," is used, the amount of mineral admixture shall not be less than 10 percent by mass of the total amount of cementitious material to be used in the mix

C. The total amount of mineral admixture shall not exceed 35 percent by mass of the total amount of cementitious material to be used in the mix. Where Section 90-1.01, "Description," specifies a maximum cementitious content in kilograms per cubic meter, the total mass of cement and mineral admixture per cubic meter shall not exceed the specified maximum cementitious material content.

90-4.09 BLANK

90-4.10 PROPORTIONING AND DISPENSING LIQUID ADMIXTURES

- Chemical admixtures and air-entraining admixtures shall be dispensed in liquid form. Dispensers for liquid admixtures shall have sufficient capacity to measure at one time the prescribed quantity required for each batch of concrete. Each dispenser shall include a graduated measuring unit into which liquid admixtures are measured to within ±5 percent of the prescribed quantity for each batch. Dispensers shall be located and maintained so that the graduations can be accurately read from the point at which proportioning operations are controlled to permit a visual check of batching accuracy prior to discharge. Each measuring unit shall be clearly marked for the type and quantity of admixture.
- Each liquid admixture dispensing system shall be equipped with a sampling device consisting of a valve located in a safe and readily accessible position such that a sample of the admixture may be withdrawn slowly by the Engineer.
- If more than one liquid admixture is used in the concrete mix, each liquid admixture shall have a separate measuring unit and shall be dispensed by injecting equipment located in such a manner that the admixtures are not mixed at high concentrations and do not interfere with the effectiveness of each other. When air-entraining admixtures are used in conjunction with other liquid admixtures, the air-entraining admixture shall be the first to be incorporated into the mix.
- When automatic proportioning devices are required for concrete pavement, dispensers for liquid admixtures shall operate automatically with the batching control equipment. The dispensers shall be equipped with an automatic warning system in good operating condition that will provide a visible or audible signal at the point at which proportioning operations are controlled when the quantity of admixture measured for each batch of concrete varies from the preselected dosage by more than 5 percent, or when the entire contents of the measuring unit are not emptied from the dispenser into each batch of concrete.
- Unless liquid admixtures are added to premeasured water for the batch, their discharge into the batch shall be arranged to flow into the stream of water so that the admixtures are well dispersed throughout the batch, except that air-entraining admixtures may be dispensed directly into moist sand in the batching bins provided that adequate control of the air content of the concrete can be maintained.
- Liquid admixtures requiring dosages greater than 2.5 L/m^3 shall be considered to be water when determining the total amount of free water as specified in Section 90-6.06, "Amount of Water and Penetration."

• Special admixtures, such as "high range" water reducers that may contribute to a high rate of slump loss, shall be measured and dispensed as recommended by the admixture manufacturer and as approved by the Engineer.

90-4.11 STORAGE, PROPORTIONING, AND DISPENSING OF MINERAL ADMIXTURES

• Mineral admixtures shall be protected from exposure to moisture until used. Sacked material shall be piled to permit access for tally, inspection and identification for each shipment.

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

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

• When concrete is completely mixed in stationary paving mixers, the mineral admixture shall be weighed in a separate weigh hopper conforming to the provisions for cement weigh hoppers and charging and discharging mechanisms in Section 90-5.03A, "Proportioning for Pavement," and the mineral admixture and cement shall be introduced simultaneously into the mixer proportionately with the aggregate. If the mineral admixture is not weighed in a separate weigh hopper, the Contractor shall provide certification that the stationary mixer is capable of mixing the cement, admixture, aggregates and water uniformly prior to discharge. Certification shall contain the following:

A. Test results for 2 compressive strength test cylinders of concrete taken within the first one-third and 2 compressive strength test cylinders of concrete taken within the last one-third of the concrete discharged from a single batch from the stationary paving mixer. Strength tests and cylinder preparation will be in conformance with the provisions of Section 90-9, "Compressive Strength;"
B. Calculations demonstrating that the difference in the averages of 2 compressive strengths taken in the first one-third is no greater than 7.5 percent different than the averages of 2 compressive strengths taken in the last one-third of the concrete discharged from a single batch from the stationary paving mixer. Strength tests and cylinder preparation will be in conformance with the provisions of Section 90-9, "Compressive Strength;" and
C. The mixer rotation speed and time of mixing prior to discharge that are required to produce a mix that meets the requirements above.

90-5 PROPORTIONING

90-5.01 STORAGE OF AGGREGATES

• Aggregates shall be stored or stockpiled in such a manner that separation of coarse and fine particles of each size shall be avoided and also that the various sizes shall not become intermixed before proportioning.

• Aggregates shall be stored or stockpiled and handled in a manner that shall prevent contamination by foreign materials. In addition, storage of aggregates at batching or mixing facilities that are erected subsequent to the award of the contract and that furnish concrete to the project shall conform to the following:

A. Intermingling of the different sizes of aggregates shall be positively prevented. The Contractor shall take the necessary measures to prevent intermingling. The preventive measures may include, but are not necessarily limited to, physical separation of stockpiles or construction of bulkheads of adequate length and height; and
B. Contamination of aggregates by contact with the ground shall be positively prevented. The Contractor shall take the necessary measures to prevent contamination. The preventive measures shall include, but are not necessarily limited to, placing aggregates on wooden platforms or on hardened surfaces consisting of portland cement concrete, asphalt concrete, or cement treated material.

• In placing aggregates in storage or in moving the aggregates from storage to the weigh hopper of the batching plant, any method that may cause segregation, degradation, or the combining of materials of different gradings that will result in any size of aggregate at the weigh hopper failing to meet the grading requirements, shall be discontinued. Any method of handling aggregates that results in excessive breakage of particles shall be discontinued. The use of suitable devices to reduce impact of falling aggregates may be required by the Engineer.

90-5.02 PROPORTIONING DEVICES

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

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

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

• Equipment for cumulative weighing of aggregate shall have a zero tolerance of ±0.5 percent of the designated total batch mass of the aggregate. For systems with individual weigh hoppers for the various sizes of aggregate, the zero tolerance shall be ±0.5 percent of the individual batch mass designated for each size of aggregate. Equipment for cumulative weighing of cement and mineral admixtures shall have a zero tolerance of ±0.5 percent of the designated total batch mass of the cement and mineral admixture. Equipment for weighing cement or mineral admixture separately shall have a zero tolerance of ±0.5 percent of their designated individual batch masses. Equipment for measuring water shall have a zero tolerance of ±0.5 percent of its designated mass or volume.

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

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

• Each scale graduation shall be approximately 0.001 of the total capacity of the scale. The capacity of scales for weighing cement, mineral admixture, or cement plus mineral admixture and aggregates shall not exceed that of commercially available scales having single graduations indicating a mass not exceeding the maximum permissible mass variation above, except that no scale shall be required having a capacity of less than 500 kg, with 0.5-kg graduations.

90-5.03 PROPORTIONING

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

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

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

• Bulk "Type IP (MS) Modified" cement shall be weighed in an individual hopper and shall be kept separate from the aggregates until the ingredients are released for discharge into the mixer.

• Bulk cement and mineral admixture may be weighed in separate, individual weigh hoppers or may be weighed in the same weigh hopper and shall be kept separate from the aggregates until the ingredients are released for discharge into the mixer. If the cement and mineral admixture are weighed cumulatively, the cement shall be weighed first.

• When cement and mineral admixtures are weighed in separate weigh hoppers**,** the weigh systems for the proportioning of the aggregate, the cement, and the mineral admixture shall be individual and distinct from all other weigh systems. Each weigh system shall be equipped with a hopper, a lever system, and an indicator to constitute an individual and independent material weighing device. The cement and the mineral admixture shall be discharged into the mixer simultaneously with the aggregate.

• The scales and weigh hoppers for bulk weighing cement, mineral admixture, or cement plus mineral admixture shall be separate and distinct from the aggregate weighing equipment.

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

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

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

90-5.03A Proportioning for Pavement

• Aggregates and bulk cement, mineral admixture, and cement plus mineral admixture for use in pavement shall be proportioned by mass by means of automatic proportioning devices of approved type conforming to these specifications.

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

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

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

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

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

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

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

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

90-6 MIXING AND TRANSPORTING

90-6.01 GENERAL

• Concrete shall be mixed in mechanically operated mixers, except that when permitted by the Engineer, batches not exceeding 0.25 m^3 may be mixed by hand methods in conformance with the provisions in Section 90-6.05, "Hand-Mixing."

• Equipment having components made of aluminum or magnesium alloys that would have contact with plastic concrete during mixing, transporting, or pumping of portland cement concrete shall not be used.

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

• Uniformity of concrete mixtures will be determined by differences in penetration as determined by California Test 533, or slump as determined by ASTM Designation: C 143, and by variations in the proportion of coarse aggregate as determined by California Test 529.

• When the mix design specifies a penetration value, the difference in penetration, determined by comparing penetration tests on 2 samples of mixed concrete from the same batch or truck mixer load, shall not exceed 10 mm. When the mix design specifies a slump value, the difference in slump, determined by comparing slump tests on 2 samples of mixed concrete from the same batch or truck mixer load, shall not exceed the values given in the table below. Variation in the

proportion of coarse aggregate will be determined by comparing the results of tests of 2 samples of mixed concrete from the same batch or truck mixer load and the difference between the 2 results shall not exceed 100 kg per cubic meter of concrete.

Average Slump	Maximum Permissible Difference
Less than 100-mm	25-mm
100-mm to 150-mm	38-mm
Greater than 150-mm to 225-mm	50-mm

- The Contractor, at the Contractor's expense, shall furnish samples of the freshly mixed concrete and provide satisfactory facilities for obtaining the samples.

90-6.02 MACHINE MIXING

- Concrete mixers may be of the revolving drum or the revolving blade type, and the mixing drum or blades shall be operated uniformly at the mixing speed recommended by the manufacturer. Mixers and agitators that have an accumulation of hard concrete or mortar shall not be used.
- The temperature of mixed concrete, immediately before placing, shall be not less than 10°C or more than 32°C. Aggregates and water shall be heated or cooled as necessary to produce concrete within these temperature limits. Neither aggregates nor mixing water shall be heated to exceed 65°C. If ice is used to cool the concrete, discharge of the mixer will not be permitted until all ice is melted.
- The batch shall be so charged into the mixer that some water will enter in advance of cementitious materials and aggregates. All water shall be in the drum by the end of the first one-fourth of the specified mixing time.
- Cementitious materials shall be batched and charged into the mixer by means that will not result either in loss of cementitious materials due to the effect of wind, in accumulation of cementitious materials on surfaces of conveyors or hoppers, or in other conditions that reduce or vary the required quantity of cementitious material in the concrete mixture.
- Paving and stationary mixers shall be operated with an automatic timing device. The timing device and discharge mechanism shall be interlocked so that during normal operation no part of the batch will be discharged until the specified mixing time has elapsed.
- The total elapsed time between the intermingling of damp aggregates and all cementitious materials and the start of mixing shall not exceed 30 minutes.
- The size of batch shall not exceed the manufacturer's guaranteed capacity.
- When producing concrete for pavement or base, suitable batch counters shall be installed and maintained in good operating condition at jobsite batching plants and stationary mixers. The batch counters shall indicate the exact number of batches proportioned and mixed.
- Concrete shall be mixed and delivered to the jobsite by means of one of the following combinations of operations:

A. Mixed completely in a stationary mixer and the mixed concrete transported to the point of delivery in truck agitators or in non-agitating hauling equipment (central-mixed concrete).
B. Mixed partially in a stationary mixer, and the mixing completed in a truck mixer (shrink-mixed concrete).
C. Mixed completely in a truck mixer (transit-mixed concrete).
D. Mixed completely in a paving mixer.

- Agitators may be truck mixers operating at agitating speed or truck agitators. Each mixer and agitator shall have attached thereto in a prominent place a metal plate or plates on which is plainly marked the various uses for which the equipment is designed, the manufacturer's guaranteed capacity of the drum or container in terms of the volume of mixed concrete and the speed of rotation of the mixing drum or blades.
- Truck mixers shall be equipped with electrically or mechanically actuated revolution counters by which the number of revolutions of the drum or blades may readily be verified.
- When shrink-mixed concrete is furnished, concrete that has been partially mixed at a central plant shall be transferred to a truck mixer and all requirements for transit-mixed concrete shall apply. No credit in the number of revolutions at mixing speed shall be allowed for partial mixing in a central plant.

90-6.03 TRANSPORTING MIXED CONCRETE

- Mixed concrete may be transported to the delivery point in truck agitators or truck mixers operating at the speed designated by the manufacturer of the equipment as agitating speed, or in non-agitating hauling equipment, provided the consistency and workability of the mixed concrete upon discharge at the delivery point is suitable for adequate placement and consolidation in place, and provided the mixed concrete after hauling to the delivery point conforms to the provisions in Section 90-6.01, "General."

- Truck agitators shall be loaded not to exceed the manufacturer's guaranteed capacity and shall maintain the mixed concrete in a thoroughly mixed and uniform mass during hauling.
- Bodies of non-agitating hauling equipment shall be constructed so that leakage of the concrete mix, or any part thereof, will not occur at any time.
- Concrete hauled in open-top vehicles shall be protected during hauling against rain or against exposure to the sun for more than 20 minutes when the ambient temperature exceeds 24°C.
- No additional mixing water shall be incorporated into the concrete during hauling or after arrival at the delivery point, unless authorized by the Engineer. If the Engineer authorizes additional water to be incorporated into the concrete, the drum shall be revolved not less than 30 revolutions at mixing speed after the water is added and before discharge is commenced.
- The rate of discharge of mixed concrete from truck mixer-agitators shall be controlled by the speed of rotation of the drum in the discharge direction with the discharge gate fully open.
- When a truck mixer or agitator is used for transporting concrete to the delivery point, discharge shall be completed within 1.5 hours or before 250 revolutions of the drum or blades, whichever occurs first, after the introduction of the cement to the aggregates. Under conditions contributing to quick stiffening of the concrete, or when the temperature of the concrete is 30°C or above, the time allowed may be less than 1.5 hours.
- When non-agitating hauling equipment is used for transporting concrete to the delivery point, discharge shall be completed within one hour after the addition of the cement to the aggregates. Under conditions contributing to quick stiffening of the concrete, or when the temperature of the concrete is 30°C or above, the time between the introduction of cement to the aggregates and discharge shall not exceed 45 minutes.
- Each load of concrete delivered at the jobsite shall be accompanied by a weighmaster certificate showing the mix identification number, non-repeating load number, date and time at which the materials were batched, the total amount of water added to the load, and for transit-mixed concrete, the reading of the revolution counter at the time the truck mixer is charged with cement. This weighmaster certificate shall also show the actual scale masses (kilograms) for the ingredients batched. Theoretical or target batch masses shall not be used as a substitute for actual scale masses.
- Weighmaster certificates shall be provided in printed form, or if approved by the Engineer, the data may be submitted in electronic media. Electronic media shall be presented in a tab-delimited format on a 90 mm diskette with a capacity of at least 1.4 megabytes. Captured data, for the ingredients represented by each batch shall be "line feed, carriage return" (LFCR) and "one line, separate record" with allowances for sufficient fields to satisfy the amount of data required by these specifications.
- The Contractor may furnish a weighmaster certificate accompanied by a separate certificate that lists the actual batch masses or measurements for a load of concrete provided that both certificates are imprinted with the same non-repeating load number that is unique to the contract and delivered to the jobsite with the load.
- Weighmaster certificates furnished by the Contractor shall conform to the provisions in Section 9-1.01, "Measurement of Quantities."

90-6.04 TIME OR AMOUNT OF MIXING

- Mixing of concrete in paving or stationary mixers shall continue for the required mixing time after all ingredients, except water and admixture, if added with the water, are in the mixing compartment of the mixer before any part of the batch is released. Transfer time in multiple drum mixers shall not be counted as part of the required mixing time.
- The required mixing time, in paving or stationary mixers, of concrete used for concrete structures, except minor structures, shall be not less than 90 seconds or more than 5 minutes, except that when directed by the Engineer in writing, the requirements of the following paragraph shall apply.
- The required mixing time, in paving or stationary mixers, except as provided in the preceding paragraph, shall be not less than 50 seconds or more than 5 minutes.
- The minimum required revolutions at the mixing speed for transit-mixed concrete shall not be less than that recommended by the mixer manufacturer, but in no case shall the number of revolutions be less than that required to consistently produce concrete conforming to the provisions for uniformity in Section 90-6.01, "General."

90-6.05 HAND-MIXING

- Hand-mixed concrete shall be made in batches of not more than 0.25 m^3 and shall be mixed on a watertight, level platform. The proper amount of coarse aggregate shall be measured in measuring boxes and spread on the platform and the fine aggregate shall be spread on this layer, the 2 layers being not more than 0.3 meters in total depth. On this mixture shall be spread the dry cement and mineral admixture and the whole mass turned no fewer than 2 times dry; then sufficient clean water shall be added, evenly distributed, and the whole mass again turned no fewer than 3 times, not including placing in the carriers or forms.

90-6.06 AMOUNT OF WATER AND PENETRATION

• The amount of water used in concrete mixes shall be regulated so that the penetration of the concrete as determined by California Test 533 or the slump of the concrete as determined by ASTM Designation: C 143 is within the "Nominal" values shown in the following table. When the penetration or slump of the concrete is found to exceed the nominal values listed, the mixture of subsequent batches shall be adjusted to reduce the penetration or slump to a value within the nominal range shown. Batches of concrete with a penetration or slump exceeding the maximum values listed shall not be used in the work. When Type F or Type G chemical admixtures are added to the mix, the penetration requirements shall not apply and the slump shall not exceed 225 mm after the chemical admixtures are added.

Type of Work	Nominal		Maximum	
	Penetration (mm)	Slump (mm)	Penetration (mm)	Slump (mm)
Concrete Pavement	0-25	—	40	—
Non-reinforced concrete facilities	0-35	—	50	—
Reinforced concrete structures				
Sections over 300-mm thick	0-35	—	65	—
Sections 300-mm thick or less	0-50	—	75	—
Concrete placed under water	—	150-200	—	225
Cast-in-place concrete piles	65-90	130-180	100	200

• The amount of free water used in concrete shall not exceed 183 kg/m^3, plus 20 kg for each required 100 kg of cementitious material in excess of 325 kg/m^3.

• The term free water is defined as the total water in the mixture minus the water absorbed by the aggregates in reaching a saturated surface-dry condition.

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

• The equipment for supplying water to the mixer shall be constructed and arranged so that the amount of water added can be measured accurately. Any method of discharging water into the mixer for a batch shall be accurate within 1.5 percent of the quantity of water required to be added to the mix for any position of the mixer. Tanks used to measure water shall be designed so that water cannot enter while water is being discharged into the mixer and discharge into the mixer shall be made rapidly in one operation without dribbling. All equipment shall be arranged so as to permit checking the amount of water delivered by discharging into measured containers.

90-7 CURING CONCRETE

90-7.01 METHODS OF CURING

• Newly placed concrete shall be cured by the methods specified in this Section 90-7.01 and the special provisions.

90-7.01A Water Method

• The concrete shall be kept continuously wet by the application of water for a minimum curing period of 7 days after the concrete has been placed.

• When a curing medium consisting of cotton mats, rugs, carpets, or earth or sand blankets is to be used to retain the moisture, the entire surface of the concrete shall be kept damp by applying water with a nozzle that so atomizes the flow that a mist and not a spray is formed, until the surface of the concrete is covered with the curing medium. The moisture from the nozzle shall not be applied under pressure directly upon the concrete and shall not be allowed to accumulate on the concrete in a quantity sufficient to cause a flow or wash the surface. At the expiration of the curing period, the concrete surfaces shall be cleared of all curing mediums.

• When concrete bridge decks and flat slabs are to be cured without the use of a curing medium, the entire surface of the bridge deck or slab shall be kept damp by the application of water with an atomizing nozzle as specified in the preceding paragraph, until the concrete has set, after which the entire surface of the concrete shall be sprinkled continuously with water for a period of not less than 7 days.

90-7.01B Curing Compound Method

- Surfaces of the concrete that are exposed to the air shall be sprayed uniformly with a curing compound.
- Curing compounds to be used shall be as follows:

1. Pigmented curing compound conforming to the requirements in ASTM Designation: C 309, Type 2, Class B, except the resin type shall be poly-alpha-methylstyrene.
2. Pigmented curing compound conforming to the requirements in ASTM Designation: C 309, Type 2, Class B.
3. Pigmented curing compound conforming to the requirements in ASTM Designation: C 309, Type 2, Class A.
4. Non-pigmented curing compound conforming to the requirements in ASTM Designation: C 309, Type 1, Class B.
5. Non-pigmented curing compound conforming to the requirements in ASTM Designation: C 309, Type 1, Class A.
6. Non-pigmented curing compound with fugitive dye conforming to the requirements in ASTM Designation: C 309, Type 1-D, Class A.

- The infrared scan for the dried vehicle from curing compound (1) shall match the infrared scan on file at the Transportation Laboratory.
- The loss of water for each type of curing compound, when tested in conformance with the requirements in California Test 534, shall not be more than 0.15-kg/m^2 in 24 hours.
- The curing compound to be used will be specified elsewhere in these specifications or in the special provisions.
- When the use of curing compound is required or permitted elsewhere in these specifications or in the special provisions and no specific kind is specified, any of the curing compounds listed above may be used.
- Curing compound shall be applied at a nominal rate of 3.7 m^2/L, unless otherwise specified.
- At any point, the application rate shall be within ±1.2 m^2/L of the nominal rate specified, and the average application rate shall be within ±0.5 m^2/L of the nominal rate specified when tested in conformance with the requirements in California Test 535. Runs, sags, thin areas, skips, or holidays in the applied curing compound shall be evidence that the application is not satisfactory.
- Curing compounds shall be applied using power operated spray equipment. The power operated spraying equipment shall be equipped with an operational pressure gage and a means of controlling the pressure. Hand spraying of small and irregular areas that are not reasonably accessible to mechanical spraying equipment, in the opinion of the Engineer, may be permitted.
- The curing compound shall be applied to the concrete following the surface finishing operation, immediately before the moisture sheen disappears from the surface, but before any drying shrinkage or craze cracks begin to appear. In the event of any drying or cracking of the surface, application of water with an atomizing nozzle as specified in Section 90-7.01A, "Water Method," shall be started immediately and shall be continued until application of the compound is resumed or started; however, the compound shall not be applied over any resulting freestanding water. Should the film of compound be damaged from any cause before the expiration of 7 days after the concrete is placed in the case of structures and 72 hours in the case of pavement, the damaged portion shall be repaired immediately with additional compound.
- At the time of use, compounds containing pigments shall be in a thoroughly mixed condition with the pigment uniformly dispersed throughout the vehicle. A paddle shall be used to loosen all settled pigment from the bottom of the container, and a power driven agitator shall be used to disperse the pigment uniformly throughout the vehicle.
- Agitation shall not introduce air or other foreign substance into the curing compound.
- The manufacturer shall include in the curing compound the necessary additives for control of sagging, pigment settling, leveling, de-emulsification, or other requisite qualities of a satisfactory working material. Pigmented curing compounds shall be manufactured so that the pigment does not settle badly, does not cake or thicken in the container, and does not become granular or curdled. Settlement of pigment shall be a thoroughly wetted, soft, mushy mass permitting the complete and easy vertical penetration of a paddle. Settled pigment shall be easily redispersed, with minimum resistance to the sideways manual motion of the paddle across the bottom of the container, to form a smooth uniform product of the proper consistency.
- Curing compounds shall remain sprayable at temperatures above 4°C and shall not be diluted or altered after manufacture.
- The curing compound shall be packaged in clean 1040-L totes, 210-L barrels

or 19-L pails shall be supplied from a suitable storage tank located at the jobsite. The containers shall comply with "Title 49, Code of Federal Regulations, Hazardous Materials Regulations." The 1040-L totes and the 210-L barrels shall have removable lids and airtight fasteners. The 19-L pails shall be round and have standard full open head and bail. Lids with bungholes shall not be permitted. Settling or separation of solids in containers, except tanks, must be completely redispersed with low speed mixing prior to use, in conformance with these specifications and the manufacturer's recommendations. Mixing shall be accomplished either manually by use of a paddle or by use of a mixing blade driven by a drill motor, at low speed. Mixing blades shall be the type used for mixing paint. On site storage tanks shall be kept clean

and free of contaminants. Each tank shall have a permanent system designed to completely redisperse settled material without introducing air or other foreign substances.

- Steel containers and lids shall be lined with a coating that will prevent destructive action by the compound or chemical agents in the air space above the compound. The coating shall not come off the container or lid as skins. Containers shall be filled in a manner that will prevent skinning. Plastic containers shall not react with the compound.
- Each container shall be labeled with the manufacturer's name, kind of curing compound, batch number, volume, date of manufacture, and volatile organic compound (VOC) content. The label shall also warn that the curing compound containing pigment shall be well stirred before use. Precautions concerning the handling and the application of curing compound shall be shown on the label of the curing compound containers in conformance with the Construction Safety Orders and General Industry Safety Orders of the State of California.
- Containers of curing compound shall be labeled to indicate that the contents fully comply with the rules and regulations concerning air pollution control in the State of California.
- When the curing compound is shipped in tanks or tank trucks, a shipping invoice shall accompany each load. The invoice shall contain the same information as that required herein for container labels.
- Curing compound will be sampled by the Engineer at the source of supply or at the jobsite or at both locations.
- Curing compound shall be formulated so as to maintain the specified properties for a minimum of one year. The Engineer may require additional testing before use to determine compliance with these specifications if the compound has not been used within one year or whenever the Engineer has reason to believe the compound is no longer satisfactory.
- Tests will be conducted in conformance with the latest ASTM test methods and methods in use by the Transportation Laboratory.

90-7.01C Waterproof Membrane Method

- The exposed finished surfaces of concrete shall be sprayed with water, using a nozzle that so atomizes the flow that a mist and not a spray is formed, until the concrete has set, after which the curing membrane shall be placed. The curing membrane shall remain in place for a period of not less than 72 hours.
- Sheeting material for curing concrete shall conform to the requirements in AASHTO Designation: M 171 for white reflective materials.
- The sheeting material shall be fabricated into sheets of such width as to provide a complete cover for the entire concrete surface. Joints in the sheets shall be securely cemented together in such a manner as to provide a waterproof joint. The joint seams shall have a minimum lap of 100 mm.
- The sheets shall be securely weighted down by placing a bank of earth on the edges of the sheets or by other means satisfactory to the Engineer.
- Should any portion of the sheets be broken or damaged before the expiration of 72 hours after being placed, the broken or damaged portions shall be immediately repaired with new sheets properly cemented into place.
- Sections of membrane that have lost their waterproof qualities or have been damaged to such an extent as to render them unfit for curing the concrete shall not be used.

90-7.01D Forms-In-Place Method

- Formed surfaces of concrete may be cured by retaining the forms in place. The forms shall remain in place for a minimum period of 7 days after the concrete has been placed, except that for members over 0.5-m in least dimension the forms shall remain in place for a minimum period of 5 days.
- Joints in the forms and the joints between the end of forms and concrete shall be kept moisture tight during the curing period. Cracks in the forms and cracks between the forms and the concrete shall be resealed by methods subject to the approval of the Engineer.

90-7.02 CURING PAVEMENT

- The entire exposed area of the pavement, including edges, shall be cured by the waterproof membrane method, or curing compound method using curing compound (1) or (2) as the Contractor may elect. Should the side forms be removed before the expiration of 72 hours following the start of curing, the exposed pavement edges shall also be cured. If the pavement is cured by means of the curing compound method, the sawcut and all portions of the curing compound that have been disturbed by sawing operations shall be restored by spraying with additional curing compound.
- Curing shall commence as soon as the finishing process provided in Section 40-1.10, "Final Finishing," has been completed. The method selected shall conform to the provisions in Section 90-7.01, "Methods of Curing."
- When the curing compound method is used, the compound shall be applied to the entire pavement surface by mechanical sprayers. Spraying equipment shall be of the fully atomizing type equipped with a tank agitator that provides for continual agitation of the curing compound during the time of application. The spray shall be adequately protected against wind, and the nozzles shall be so oriented or moved mechanically transversely as to result in the minimum specified rate of

coverage being applied uniformly on exposed faces. Hand spraying of small and irregular areas, and areas inaccessible to mechanical spraying equipment, in the opinion of the Engineer, will be permitted. When the ambient air temperature is above 15°C, the Contractor shall fog the surface of the concrete with a fine spray of water as specified in Section 90-7.01A, "Water Method." The surface of the pavement shall be kept moist between the hours of 10:00 a.m. and 4:30 p.m. on the day the concrete is placed. However, the fogging done after the curing compound has been applied shall not begin until the compound has set sufficiently to prevent displacement. Fogging shall be discontinued if ordered in writing by the Engineer.

90-7.03 CURING STRUCTURES

- Newly placed concrete for cast-in-place structures, other than highway bridge decks, shall be cured by the water method, the forms-in-place method, or, as permitted herein, by the curing compound method, in conformance with the provisions in Section 90-7.01, "Methods of Curing."
- The curing compound method using a pigmented curing compound may be used on concrete surfaces of construction joints, surfaces that are to be buried underground, and surfaces where only Ordinary Surface Finish is to be applied and on which a uniform color is not required and that will not be visible from a public traveled way. If the Contractor elects to use the curing compound method on the bottom slab of box girder spans, the curing compound shall be curing compound (1).
- The top surface of highway bridge decks shall be cured by both the curing compound method and the water method. The curing compound shall be curing compound (1).
- Concrete surfaces of minor structures, as defined in Section 51-1.02, "Minor Structures," shall be cured by the water method, the forms-in-place method or the curing compound method.
- When deemed necessary by the Engineer during periods of hot weather, water shall be applied to concrete surfaces being cured by the curing compound method or by the forms-in-place method, until the Engineer determines that a cooling effect is no longer required. Application of water for this purpose will be paid for as extra work as provided in Section 4-1.03D, "Extra Work."

90-7.04 CURING PRECAST CONCRETE MEMBERS

- Precast concrete members shall be cured in conformance with any of the methods specified in Section 90-7.01, "Methods of Curing." Curing shall be provided for the minimum time specified for each method or until the concrete reaches its design strength, whichever is less. Steam curing may also be used for precast members and shall conform to the following provisions:

A. After placement of the concrete, members shall be held for a minimum 4-hour presteaming period. If the ambient air temperature is below 10°C, steam shall be applied during the presteaming period to hold the air surrounding the member at a temperature between 10°C and 32°C.
B. To prevent moisture loss on exposed surfaces during the presteaming period, members shall be covered as soon as possible after casting or the exposed surfaces shall be kept wet by fog spray or wet blankets.
C. Enclosures for steam curing shall allow free circulation of steam about the member and shall be constructed to contain the live steam with a minimum moisture loss. The use of tarpaulins or similar flexible covers will be permitted, provided they are kept in good repair and secured in such a manner as to prevent the loss of steam and moisture.
D. Steam at the jets shall be at low pressure and in a saturated condition. Steam jets shall not impinge directly on the concrete, test cylinders, or forms. During application of the steam, the temperature rise within the enclosure shall not exceed 22°C per hour. The curing temperature throughout the enclosure shall not exceed 65°C and shall be maintained at a constant level for a sufficient time necessary to develop the required transfer strength. Control cylinders shall be covered to prevent moisture loss and shall be placed in a location where temperature is representative of the average temperature of the enclosure.
E. Temperature recording devices that will provide an accurate, continuous, permanent record of the curing temperature shall be provided. A minimum of one temperature recording device per 60 m of continuous bed length will be required for checking temperature.
F. Members in pretension beds shall be detensioned immediately after the termination of steam curing while the concrete and forms are still warm, or the temperature under the enclosure shall be maintained above 15°C until the stress is transferred to the concrete.
G. Curing of precast concrete will be considered completed after termination of the steam curing cycle.

90-7.05 CURING PRECAST PRESTRESSED CONCRETE PILES

• Newly placed concrete for precast prestressed concrete piles shall be cured in conformance with the provisions in Section 90-7.04, "Curing Precast Concrete Members," except that piles with a class designation ending in C (corrosion resistant) shall be cured as follows:

A. Piles shall be either steam cured or water cured. If water curing is used, the piles shall be kept continuously wet by the application of water in conformance with the provisions in Section 90-7.01A, "Water Method."
B. If steam curing is used, the steam curing provisions in Section 90-7.04, "Curing Precast Concrete Members," shall apply except that the piles shall be kept continuously wet for their entire length for a period of not less than 3 days, including the holding and steam curing periods.

90-7.06 CURING SLOPE PROTECTION

• Concrete slope protection shall be cured in conformance with any of the methods specified in Section 90-7.01, "Methods of Curing."

• Concreted-rock slope protection shall be cured in conformance with any of the methods specified in Section 90-7.01, "Methods of Curing," or with a blanket of earth kept wet for 72 hours, or by sprinkling with a fine spray of water every 2 hours during the daytime for a period of 3 days.

90-7.07 CURING MISCELLANEOUS CONCRETE WORK

• Exposed surfaces of curbs shall be cured by pigmented curing compounds as specified in Section 90-7.01B, "Curing Compound Method."

• Concrete sidewalks, gutter depressions, island paving, curb ramps, driveways, and other miscellaneous concrete areas shall be cured in conformance with any of the methods specified in Section 90-7.01, "Methods of Curing."

• Shotcrete shall be cured for at least 72 hours by spraying with water, or by a moist earth blanket, or by any of the methods provided in Section 90-7.01, "Methods of Curing."

• Mortar and grout shall be cured by keeping the surface damp for 3 days.

• After placing, the exposed surfaces of sign structure foundations, including pedestal portions, if constructed, shall be cured for at least 72 hours by spraying with water, or by a moist earth blanket, or by any of the methods provided in Section 90-7.01, "Methods of Curing."

90-8 PROTECTING CONCRETE

90-8.01 GENERAL

• In addition to the provisions in Section 7-1.16, "Contractor's Responsibility for the Work and Materials," the Contractor shall protect concrete as provided in this Section 90-8.

• Concrete shall not be placed on frozen or ice-coated ground or subgrade nor on ice-coated forms, reinforcing steel, structural steel, conduits, precast members, or construction joints.

• Under rainy conditions, placing of concrete shall be stopped before the quantity of surface water is sufficient to damage surface mortar or cause a flow or wash of the concrete surface, unless the Contractor provides adequate protection against damage.

• Concrete that has been frozen or damaged by other causes, as determined by the Engineer, shall be removed and replaced by the Contractor at the Contractor's expense.

90-8.02 PROTECTING CONCRETE STRUCTURES

• Structure concrete and shotcrete used as structure concrete shall be maintained at a temperature of not less than 7°C for 72 hours after placing and at not less than 4°C for an additional 4 days. When required by the Engineer, the Contractor shall submit a written outline of the proposed methods for protecting the concrete.

90-8.03 PROTECTING CONCRETE PAVEMENT

• Pavement concrete shall be maintained at a temperature of not less than 4°C for 72 hours. When required by the Engineer, the Contractor shall submit a written outline of the proposed methods for protecting the concrete.

• Except as provided in Section 7-1.08, "Public Convenience," the Contractor shall protect concrete pavement against construction and other activities that abrade, scar, discolor, reduce texture depth, lower coefficient of friction, or otherwise damage the surface. Stockpiling, drifting, or excessive spillage of soil, gravel, petroleum products, and concrete or asphalt mixes on the surface of concrete pavement is prohibited unless otherwise specified in these specifications, the special provisions or permitted by the Engineer.

• When ordered by the Engineer or shown on the plans or specified in the special provisions, pavement crossings shall be constructed for the convenience of public traffic. The material and work necessary for the construction of the crossings, and their subsequent removal and disposal, will be paid for at the contract unit prices for the items of work involved and if there are no contract items for the work involved, payment for pavement crossings will be made by extra work as provided in Section 4-1.03D, "Extra Work.". Where public traffic will be required to cross over the new pavement, Type III portland cement may be used in concrete, if permitted in writing by the Engineer. The pavement may be opened to traffic as soon as the concrete has developed a modulus of rupture of 3.8 MPa. The modulus of rupture will be determined by California Test 523.

• No traffic or Contractor's equipment, except as hereinafter provided, will be permitted on the pavement before a period of 10 days has elapsed after the concrete has been placed, nor before the concrete has developed a modulus of rupture of at least 3.8 MPa. Concrete that fails to attain a modulus of rupture of 3.8 MPa within 10 days shall not be opened to traffic until directed by the Engineer.

• Equipment for sawing weakened plane joints will be permitted on the pavement as specified in Section 40-1.08B, "Weakened Plane Joints."

• When requested in writing by the Contractor, the tracks on one side of paving equipment will be permitted on the pavement after a modulus of rupture of 2.4 MPa has been attained, provided that:

A. Unit pressure exerted on the pavement by the paver shall not exceed 135 kPa;
B. Tracks with cleats, grousers, or similar protuberances shall be modified or shall travel on planks or equivalent protective material, so that the pavement is not damaged; and
C. No part of the track shall be closer than 0.3-m from the edge of pavement.

• In case of visible cracking of, or other damage to the pavement, operation of the paving equipment on the pavement shall be immediately discontinued.

• Damage to the pavement resulting from early use of pavement by the Contractor's equipment as provided above shall be repaired by the Contractor at the Contractor's expense.

• The State will furnish the molds and machines for testing the concrete for modulus of rupture, and the Contractor, at the Contractor's expense, shall furnish the material and whatever labor the Engineer may require.

90-9 COMPRESSIVE STRENGTH

90-9.01 GENERAL

• Concrete compressive strength requirements consist of a minimum strength that shall be attained before various loads or stresses are applied to the concrete and, for concrete designated by strength, a minimum strength at the age of 28 days or at the age otherwise allowed in Section 90-1.01, "Description." The various strengths required are specified in these specifications or the special provisions or are shown on the plans.

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

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

• When concrete is designated by 28-day compressive strength rather than by cementitious material content, the concrete strength to be used as a basis for acceptance of other than steam cured concrete will be determined from cylinders cured in conformance with Method 1 of California Test 540. If the result of a single compressive strength test at the maximum age specified or allowed is below the specified strength but is 95 percent or more of the specified strength, the Contractor shall, at the Contractor's expense, make corrective changes, subject to approval of the Engineer, in the mix proportions or in the concrete fabrication procedures, before placing additional concrete, and shall pay to the State $14 for each in-place cubic meter of concrete represented by the deficient test. If the result of a single compressive strength test at the maximum age specified or allowed is below 95 percent of the specified strength, but is 85 percent or more of the specified strength, the Contractor shall make the corrective changes specified above, and shall pay to the State $20 for each in place cubic meter of concrete represented by the deficient test. In addition, such corrective changes shall be made when

the compressive strength of concrete tested at 7 days indicates, in the judgment of the Engineer, that the concrete will not attain the required compressive strength at the maximum age specified or allowed. Concrete represented by a single test that indicates a compressive strength of less than 85 percent of the specified 28-day compressive strength will be rejected in conformance with the provisions in Section 6-1.04, "Defective Materials."

- If the test result indicates that the compressive strength at the maximum curing age specified or allowed is below the specified strength, but is 85 percent or more of the specified strength, payments to the State as required above shall be made, unless the Contractor, at the Contractor's expense, obtains and submits evidence acceptable to the Engineer that the strength of the concrete placed in the work meets or exceeds the specified 28-day compressive strength. If the test result indicates a compressive strength at the maximum curing age specified or allowed below 85 percent, the concrete represented by that test will be rejected, unless the Contractor, at the Contractor's expense, obtains and submits evidence acceptable to the Engineer that the strength and quality of the concrete placed in the work are acceptable. If the evidence consists of tests made on cores taken from the work, the cores shall be obtained and tested in conformance with the requirements in ASTM Designation: C 42.
- No single compressive strength test shall represent more than 250 m^3.
- When a precast concrete member is steam cured, the compressive strength of the concrete will be determined from test cylinders that have been handled and stored in conformance with Method 3 of California Test 540. The compressive strength of steam cured concrete will be evaluated on the basis of individual tests representing specific portions of production. When the concrete is designated by 28-day compressive strength rather than by cementitious material content, the concrete shall be considered to be acceptable whenever its compressive strength reaches the specified 28-day compressive strength provided that strength is reached in not more than the maximum number of days specified or allowed after the member is cast.
- When concrete is specified by compressive strength, prequalification of materials, mix proportions, mixing equipment, and procedures proposed for use will be required prior to placement of the concrete. Prequalification shall be accomplished by the submission of acceptable certified test data or trial batch reports by the Contractor. Prequalification data shall be based on the use of materials, mix proportions, mixing equipment, procedures, and size of batch proposed for use in the work.
- Certified test data, in order to be acceptable, shall indicate that not less than 90 percent of at least 20 consecutive tests exceed the specified strength at the maximum number of cure days specified or allowed, and none of those tests are less than 95 percent of specified strength. Strength tests included in the data shall be the most recent tests made on concrete of the proposed mix design and all shall have been made within one year of the proposed use of the concrete.
- Trial batch test reports, in order to be acceptable, shall indicate that the average compressive strength of 5 consecutive concrete cylinders, taken from a single batch, at not more than 28 days (or the maximum age allowed) after molding shall be at least 4 MPa greater than the specified 28-day compressive strength, and no individual cylinder shall have a strength less than the specified strength at the maximum age specified or allowed. Data contained in the report shall be from trial batches that were produced within one year of the proposed use of specified strength concrete in the project. Whenever air-entrainment is required, the air content of trial batches shall be equal to or greater than the air content specified for the concrete without reduction due to tolerances.
- Tests shall be performed in conformance with either the appropriate California Test methods or the comparable ASTM test methods. Equipment employed in testing shall be in good condition and shall be properly calibrated. If the tests are performed during the life of the contract, the Engineer shall be notified sufficiently in advance of performing the tests in order to witness the test procedures.
- The certified test data and trial batch test reports shall include the following information:

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

- Certified test data and trial batch test reports shall be signed by an official of the firm that performed the tests.
- When approved by the Engineer, concrete from trial batches may be used in the work at locations where concrete of a lower quality is required and the concrete will be paid for as the type or class of concrete required at that location.
- After materials, mix proportions, mixing equipment, and procedures for concrete have been prequalified for use, additional prequalification by testing of trial batches will be required prior to making changes that, in the judgment of the Engineer, could result in a strength of concrete below that specified.
- The Contractor's attention is directed to the time required to test trial batches and the Contractor shall be responsible for production of trial batches at a sufficiently early date so that the progress of the work is not delayed.

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

90-10 MINOR CONCRETE

90-10.01 GENERAL

- Concrete for minor structures, slope paving, curbs, sidewalks and other concrete work, when designated as minor concrete on the plans, in the specifications, or in the contract item, shall conform to the provisions specified herein.
- The Engineer, at the Engineer's discretion, will inspect and test the facilities, materials and methods for producing the concrete to ensure that minor concrete of the quality suitable for use in the work is obtained.

90-10.02 MATERIALS

- Minor concrete shall conform to the following requirements:

90-10.02A Cementitious Material

- Cementitious material shall conform to the provisions in Section 90-1.01, "Description."

90-10.02B Aggregate

- Aggregate shall be clean and free from deleterious coatings, clay balls, roots, and other extraneous materials.
- The Contractor shall submit to the Engineer for approval, a grading of the combined aggregate proposed for use in the minor concrete. After acceptance of the grading, aggregate furnished for minor concrete shall conform to that grading, unless a change is authorized in writing by the Engineer.
- The Engineer may require the Contractor to furnish periodic test reports of the aggregate grading furnished. The maximum size of aggregate used shall be at the option of the Contractor, but in no case shall the maximum size be larger than 37.5 mm or smaller than 19 mm.
- The Engineer may waive, in writing, the gradation requirements in this Section 90-10.02B, if, in the Engineer's opinion, the furnishing of the gradation is not necessary for the type or amount of concrete work to be constructed.

90-10.02C Water

- Water used for washing, mixing, and curing shall be free from oil, salts, and other impurities that would discolor or etch the surface or have an adverse affect on the quality of the concrete.

90-10.02D Admixtures

- The use of admixtures shall conform to the provisions in Section 90-4, "Admixtures."

90-10.03 PRODUCTION

- Cementitious material, water, aggregate, and admixtures shall be stored, proportioned, mixed, transported, and discharged in conformance with recognized standards of good practice that will result in concrete that is thoroughly and uniformly mixed, that is suitable for the use intended, and that conforms to requirements specified herein. Recognized standards of good practice are outlined in various industry publications such as are issued by American Concrete Institute, AASHTO, or the Department.
- The cementitious material content of minor concrete shall conform to the provisions in Section 90-1.01, "Description."
- The amount of water used shall result in a consistency of concrete conforming to the provisions in Section 90-6.06, "Amount of Water and Penetration." Additional mixing water shall not be incorporated into the concrete during hauling or after arrival at the delivery point, unless authorized by the Engineer.
- Discharge of ready-mixed concrete from the transporting vehicle shall be made while the concrete is still plastic and before stiffening occurs. An elapsed time of 1.5 hours (one hour in non-agitating hauling equipment), or more than 250 revolutions of the drum or blades, after the introduction of the cementitious material to the aggregates, or a temperature of concrete of more than 32°C will be considered conditions contributing to the quick stiffening of concrete. The Contractor shall take whatever action is necessary to eliminate quick stiffening, except that the addition of water will not be permitted.
- The required mixing time in stationary mixers shall be not less than 50 seconds or more than 5 minutes.

- The minimum required revolutions at mixing speed for transit-mixed concrete shall be not less than that recommended by the mixer manufacturer, and shall be increased, if necessary, to produce thoroughly and uniformly mixed concrete.
- Each load of ready-mixed concrete shall be accompanied by a weighmaster certificate that shall be delivered to the Engineer at the discharge location of the concrete, unless otherwise directed by the Engineer. The weighmaster certificate shall be clearly marked with the date and time of day when the load left the batching plant and, if hauled in truck mixers or agitators, the time the mixing cycle started.
- A Certificate of Compliance conforming to the provisions in Section 6–1.07, "Certificates of Compliance," shall be furnished to the Engineer, prior to placing minor concrete from a source not previously used on the contract, stating that minor concrete to be furnished meets contract requirements, including minimum cementitious material content specified.

90-10.04 CURING MINOR CONCRETE

- Curing minor concrete shall conform to the provisions in Section 90-7, "Curing Concrete."

90-10.05 PROTECTING MINOR CONCRETE

- Protecting minor concrete shall conform to the provisions in Section 90-8, "Protecting Concrete," except the concrete shall be maintained at a temperature of not less than 4°C for 72 hours after placing.

90-10.06 MEASUREMENT AND PAYMENT

- Minor concrete will be measured and paid for in conformance with the provisions specified in the various sections of these specifications covering concrete construction when minor concrete is specified in the specifications, shown on the plans, or indicated by contract item in the Engineer's Estimate.

90-11 MEASUREMENT AND PAYMENT

90-11.01 MEASUREMENT

- Portland cement concrete will be measured in conformance with the provisions specified in the various sections of these specifications covering construction requiring concrete.
- When it is provided that concrete will be measured at the mixer, the volume in cubic meters shall be computed as the total mass of the batch in kilograms divided by the density of the concrete in kilograms per cubic meter. The total mass of the batch shall be calculated as the sum of all materials, including water, entering the batch. The density of the concrete will be determined in conformance with the requirements in California Test 518.

90-11.02 PAYMENT

- Portland cement concrete will be paid for in conformance with the provisions specified in the various sections of these specifications covering construction requiring concrete.
- Full compensation for furnishing and incorporating admixtures required by these specifications or the special provisions will be considered as included in the contract prices paid for the concrete involved and no additional compensation will be allowed therefor.
- Should the Engineer order the Contractor to incorporate any admixtures in the concrete when their use is not required by these specifications or the special provisions, furnishing the admixtures and adding them to the concrete will be paid for as extra work as provided in Section 4-1.03D, "Extra Work."
- Should the Contractor use admixtures in conformance with the provisions in Section 90-4.05, "Optional Use of Chemical Admixtures," or Section 90-4.07, "Optional Use of Air-entraining Admixtures," or should the Contractor request and obtain permission to use other admixtures for the Contractor's benefit, the Contractor shall furnish those admixtures and incorporate them into the concrete at the Contractor's expense and no additional compensation will be allowed therefor.

END OF AMENDMENTS

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, Central Region Construction, P.O. Box 12616, Fresno, CA 93778, 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 the California Unified Certification Program (CUCP). It is the contractor's responsibility to confirm that the firm is DBE certified as of the date of bid opening. Listings of DBEs certified by the CUCP 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 web site at http://www.dot.ca.gov/hq/bep.
3. 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): 15 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:

Districts 04, 05 (except San Luis Obispo and Santa Barbara Counties), 06 (except Kern County) and 10:	Districts 08 and 11:
See the Department's DBE database at: http://www.dot.ca.gov/hq/bep/	Padilla & Associates - San Diego 2725 Congress Street, Suite 1D San Diego, CA 92110 Telephone: (619) 725-0843 FAX No.: (619) 725-0854
Districts 07, 08, and 12; in San Luis Obispo and Santa Barbara Counties in District 05; and in Kern County in District 06:	Districts 01, 02, 03 and 09:
Padilla & Associates - Los Angeles 5675 East Telegraph Rd., Suite A-260 Los Angeles, CA 90040 Telephone: (323) 728-8847 FAX No.: (323) 728-8867	See the Department's DBE database at: http://www.dot.ca.gov/hq/bep/

2-1.02B SUBMISSION OF DBE INFORMATION

All bidders shall complete the "CALTRANS BIDDER - DBE INFORMATION" form included in the Proposal and submit it WITH THE BID.

Failure to submit the "CALTRANS BIDDER - DBE INFORMATION" form with the bid will be grounds for finding the bid nonresponsive.

The bidder shall submit written confirmation from each DBE that the DBE is participating in the contract, and include the confirmation with the submittal of the bid or submit it by the time specified for submittal of the GOOD FAITH EFFORT (GFE) DOCUMENTATION form. A copy of a DBE's quote will serve as written confirmation that the DBE is participating in the contract.

Where the bidder has not met the designated DBE goal, it must submit good faith efforts (GFE) documentation to establish that, prior to the bid, it made adequate good faith efforts to meet the goal.

Bidders are cautioned that even though their "CALTRANS BIDDER - DBE INFORMATION" form indicates they will meet the stated DBE goal, they should also submit their GFE documentation within the time specified herein, 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 apparent successful bidder (low bidder), the second low bidder and the third low bidder shall complete and submit the GOOD FAITH EFFORT (GFE) DOCUMENTATION form, if they have not met the goal, 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. GFE documentation 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. Other bidders need not submit GFE documentation unless requested to do so by the Department. When a request is made by the Department, the GFE documentation of the other bidders shall be received by the Department within 4 days of the request, not including Saturdays, Sundays and legal holidays, unless a later time is authorized by the Department.

If it is determined that GFE documentation is needed to determine a bidder's eligibility for award, failure of the bidder to have submitted the GFE documentation by the time specified herein will be grounds for finding the bid or proposal nonresponsive.

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.

The bidder's "CALTRANS BIDDER - DBE INFORMATION" form 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, and the dollar value of each DBE transaction. 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 bidder's good faith effort (GFE) documentation shall establish that good faith efforts to meet the DBE goal have been made.

In order to establish the bidder's good faith efforts to meet the DBE goal, the bidder should include the following information and supporting documents, as necessary:

A. Items of work the bidder has made available to DBE firms. Identify those items of work the bidder might otherwise perform with its own forces and those items that have been broken down into economically feasible units to facilitate DBE participation. For each item listed, show the dollar value and percentage of the total contract. It is the bidder's responsibility to demonstrate that sufficient work to meet the goal was made available to DBE firms.
B. The names of certified DBEs and the dates on which they were solicited to bid on the project. Include the items of work offered. Describe the methods used for following up initial solicitations to determine with certainty if the DBEs were interested, and the dates of the follow-up. Attach supporting documents such as copies of letters, memos, facsimiles sent, telephone logs, telephone billing statements, and other evidence of solicitation. Bidders are reminded to solicit certified DBEs through all reasonable and available means and provide sufficient time to allow DBEs to respond.
C. For each item of work made available, the DBEs that provided quotes, the selected firm and its status as a DBE, the price quote for each firm, and the name, address and telephone number for each firm. If the firm selected for the item is not a DBE, provide the reasons for the selection.
D. The names and dates of each publication in which a request for DBE participation for the project was placed by the bidder. Attach copies of the published advertisements.
E. The names of agencies, including the firms listed in Section 2-1.02A, "DBE Goal for this Project," and the dates on which they were contacted to provide assistance in contacting, recruiting and using DBE firms. If the agencies were contacted in writing, provide copies of supporting documents.
F. Descriptions of the efforts made to provide interested DBEs with adequate information about the plans, specifications and requirements of the contract to assist them in responding to a solicitation. Where the bidder has provided information, identify the name of the DBE assisted, the nature of the information provided, and date of contact. Provide copies of supporting documents, as appropriate.

G. Descriptions of any and all efforts made to assist interested DBEs in obtaining bonding, lines of credit, insurance, necessary equipment, supplies, and materials (excluding supplies and equipment which the DBE subcontractor purchases or leases from the prime contractor or its affiliate). Where such assistance was provided by the bidder, identify the name of the DBE assisted, nature of the assistance offered, and date. Provide copies of supporting documents, as appropriate.
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 made within 30 days after the opening of the proposals if the apparent lowest bidder has met the goal for DBE participation. The award of the contract, if it be awarded, will be made within 60 days after the opening of the proposals if the apparent lowest bidder has not met the goal for DBE participation but has claimed good faith efforts to do so. These periods will be subject to extension for such further periods as may be agreed upon in writing between the Department and the bidders concerned. The award, if made, 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.

The contract shall be executed by the successful bidder and shall be returned, together with the contract bonds, to the Department so that it is received within 10 days, not including Saturdays, Sundays and legal holidays, after the bidder has received the contract for execution. Failure to do so shall be just cause for forfeiture of the proposal guaranty. The executed contract documents shall be delivered to the following address: Department of Transportation MS 43, Attn: Office Engineer, 1727 30th Street, Sacramento, CA 95816.

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," Section 8-1.06, "Time of Completion," and 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 **400 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 $6700 per day, for each and every calendar day's delay in finishing the work in excess of 400 WORKING DAYS as 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.

5-1.011 EXAMINATION OF PLANS, SPECIFICATIONS, CONTRACT, AND SITE OF WORK

Attention is directed to "Differing Site Conditions" of these special provisions regarding physical conditions at the site which may differ from those indicated in "Materials Information," log of test borings or other geotechnical information obtained by the Department's investigation of site conditions.

5-1.012 DIFFERING SITE CONDITIONS

Attention is directed to Section 5-1.116, "Differing Site Conditions," of the Standard Specifications.

During the progress of the work, if subsurface or latent conditions are encountered at the site differing materially from those indicated in the "Materials Information," log of test borings, other geotechnical data obtained by the Department's investigation of subsurface conditions, or an examination of the conditions above ground at the site, the party discovering those conditions shall promptly notify the other party in writing of the specific differing conditions before they are disturbed and before the affected work is performed.

The Contractor will be allowed 15 days from the notification of the Engineer's determination of whether or not an adjustment of the contract is warranted, in which to file a notice of potential claim in conformance with the provisions of Section 9-1.04, "Notice of Potential Claim," of the Standard Specifications and as specified herein; otherwise the decision of the Engineer shall be deemed to have been accepted by the Contractor as correct. The notice of potential claim shall set forth in what respects the Contractor's position differs from the Engineer's determination and provide any additional information obtained by the Contractor, including but not limited to additional geotechnical data. The notice of potential claim shall be accompanied by the Contractor's certification that the following were made in preparation of the bid: a review of the contract, a review of the "Materials Information," a review of the log of test borings and other records of geotechnical data to the extent they were made available to bidders prior to the opening of bids, and an examination of the conditions above ground at the site. Supplementary information, obtained by the Contractor subsequent to the filing of the notice of potential claim, shall be submitted to the Engineer in an expeditious manner.

5-1.013 LINES AND GRADES

Attention is directed to Section 5-1.07, "Lines and Grades," of the Standard Specifications.

Stakes or marks will be set by the Engineer in conformance with the requirements in Chapter 12, "Construction Surveys," of the Department's Surveys Manual.

5-1.015 LABORATORY

When a reference is made in the specifications to the "Laboratory," the reference shall mean Division of Engineering Services - Materials Engineering and Testing Services and Division of Engineering Services - Geotechnical Services 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 Division of Engineering Services - Materials Engineering and Testing Services and Division of Engineering Services - Geotechnical Services, located at 5900 Folsom Boulevard, Sacramento, CA 95819, Telephone (916) 227-7000.

5-1.017 CONTRACT BONDS

Attention is directed to Section 3-1.02, "Contract Bonds," of the Standard Specifications and these special provisions.

The payment bond shall be in a sum not less than one hundred percent of the total amount payable by the terms of the contract.

5-1.019 COST REDUCTION INCENTIVE

Attention is directed to Section 5-1.14, "Cost Reduction Incentive," of the Standard Specifications.

Prior to preparing a written cost reduction proposal, the Contractor shall request a meeting with the Engineer to discuss the proposal in concept. Items of discussion will also include permit issues, impact on other projects, impact on the project schedule, peer reviews, overall merit of the proposal, and review times required by the Department and other agencies.

If a cost reduction proposal submitted by the Contractor, and subsequently approved by the Engineer, provides for a reduction in contract time, 50 percent of that contract time reduction shall be credited to the State by reducing the contract working days, not including plant establishment. Attention is directed to "Beginning of Work, Time of Completion and Liquidated Damages" of these special provisions regarding the working days.

If a cost reduction proposal submitted by the Contractor, and subsequently approved by the Engineer, provides for a reduction in traffic congestion or avoids traffic congestion during construction, 60 percent of the estimated net savings in construction costs attributable to the cost reduction proposal will be paid to the Contractor. In addition to the requirements in Section 5-1.14, "Cost Reduction Incentive," of the Standard Specifications, the Contractor shall provide detailed comparisons of the traffic handling between the existing contract and the proposed change, and estimates of the traffic volumes and congestion.

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.

5-1.022 PAYMENT OF WITHHELD FUNDS

Payment of withheld funds shall conform to Section 9-1.065, "Payment of Withheld Funds," of the Standard Specifications and these special provisions.

Funds withheld from progress payments to ensure performance of the contract that are eligible for payment into escrow or to an escrow agent pursuant to Section 10263 of the California Public Contract Code do not include funds withheld or deducted from payment due to failure of the Contractor to fulfill a contract requirement.

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 TESTING

Testing of materials and work shall conform to the provisions in Section 6-3, "Testing," of the Standard Specifications and these special provisions.

Whenever the provisions of Section 6-3.01, "General," of the Standard Specifications refer to tests or testing, it shall mean tests to assure the quality and to determine the acceptability of the materials and work.

The Engineer will deduct the costs for testing of materials and work found to be unacceptable, as determined by the tests performed by the Department, and the costs for testing of material sources identified by the Contractor which are not used for the work, from moneys due or to become due to the Contractor. The amount deducted will be determined by the Engineer.

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.

5-1.103 RECORDS

The Contractor shall maintain cost accounting records for the contract pertaining to, and in such a manner as to provide a clear distinction between, the following six categories of costs of work during the life of the contract:

A. Direct costs of contract item work.
B. Direct costs of changes in character in conformance with Section 4-1.03C, "Changes in Character of Work," of the Standard Specifications.
C. Direct costs of extra work in conformance with Section 4-1.03D, "Extra Work," of the Standard Specifications.
D. Direct costs of work not required by the contract and performed for others.
E. Direct costs of work performed under a notice of potential claim in conformance with the provisions in Section 9-1.04, "Notice of Potential Claim," of the Standard Specifications.
F. Indirect costs of overhead.

Cost accounting records shall include the information specified for daily extra work reports in Section 9-1.03C, "Records," of the Standard Specifications. The requirements for furnishing the Engineer completed daily extra work reports shall only apply to work paid for on a force account basis.

The cost accounting records for the contract shall be maintained separately from other contracts, during the life of the contract, and for a period of not less than 3 years after the date of acceptance of the contract. If the Contractor intends to file claims against the Department, the Contractor shall keep the cost accounting records specified above until complete resolution of all claims has been reached.

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 is to maintain a cooperative communication and to mutually resolve conflicts at the lowest responsible management level.

The Contractor may request the formation of 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. If agreed to by the parties, additional "Partnering Workshops" will be conducted as needed throughout the life of the contract.

The costs involved in providing the "Partnering Workshop" facilitator and workshop site will be borne equally by the State and the Contractor. The division of cost will be made by determining the cost in providing the "Partnering Workshop" facilitator and workshop site in conformance with the provisions in Section 9-1.03B, "Work Performed by Special Forces or Other Special Services," of the Standard Specifications, and paying to the Contractor one-half of that cost, except no markups will be allowed.

All other costs associated with "Partnering Workshops" will be borne separately by the party incurring the costs, such as wages and travel expenses, and no additional compensation will be allowed therefor.

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.

5-1.114 VALUE ANALYSIS

The Contractor may submit to the Engineer, in writing, a request for a "Value Analysis" workshop. The purpose for having a workshop is to identify value enhancing opportunities and to consider modifications to the plans and specifications that will reduce either the total cost, time of construction or traffic congestion, without impairing, in any manner, the essential functions or characteristics of the project including, but not limited to, service life, economy of operation, ease of maintenance, benefits to the travelling public, desired appearance, or design and safety standards.

To maximize the potential benefits of a workshop, the request should be submitted to the Engineer early in the project after approval of the contract. If the Contractor's request for a "Value Analysis" workshop is approved by the Engineer, scheduling of a workshop, selecting the facilitator and workshop site, and other administrative details shall be determined cooperatively by the Contractor and the Engineer.

The workshop shall be conducted in conformance with the methodology described in the Department's "Value Analysis Team Guide" available at the Department's web site at:

http://www.dot.ca.gov/hq/oppd/value/

The facilitator shall be a Certified Value Specialist (CVS) as recognized by the Society of American Value Engineers (SAVE) International, which may be contacted as follows:

SAVE International, 60 Revere Drive, Northbrook, IL 60062
Telephone 1-847-480-1730, FAX 1-847-480-9282

The Contractor may submit recommendations resulting from a "Value Analysis" workshop for approval by the Engineer as cost reduction incentive proposals in conformance with the provisions in Section 5-1.14, "Cost Reduction Incentive," of the Standard Specifications.

The costs involved in providing the "Value Analysis" facilitator and workshop site will be borne equally by the State and the Contractor. The division of cost will be made by determining the cost in providing the "Value Analysis" facilitator and workshop site in conformance with the provisions in Section 9-1.03B, "Work Performed by Special Forces or Other Special Services," of the Standard Specifications, and paying to the Contractor one-half of that cost, except no markups will be allowed.

All other costs associated with the "Value Analysis" workshop will be borne separately by the party incurring the costs, such as wages and travel expenses, and no additional compensation will be allowed therefor.

5-1.12 DISPUTE REVIEW BOARD

GENERAL

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

The DRB shall be utilized when dispute or potential claim resolution at the project level is unsuccessful. The DRB shall function as specified herein until the day of acceptance of the contract, at which time the work of the DRB will cease except for completion of unfinished reports. No DRB dispute meetings shall take place later than 30 days prior to acceptance of contract. After acceptance of contract, disputes or potential claims which have followed the dispute resolution processes of the Standard Specifications and these special provisions, but have not been resolved, shall be stated or restated by the Contractor, in response to the Proposed Final Estimate within the time limits provided in Section 9-1.07B, "Final Payment

and Claims," of the Standard Specifications. The State will review those claims in conformance with the provisions in Section 9-1.07B of the Standard Specifications. Following the adherence to and completion of the contractual administrative claims procedure, the Contractor may file for arbitration in conformance with the provisions in Section 9-1.10, "Arbitration," of the Standard Specifications and these special provisions.

Disputes, as used in this section, shall include differences of opinion, properly noticed as provided hereinafter, between the State and Contractor on matters related to the work and other subjects considered by the State or Contractor, or by both, to be of concern to the DRB on this project, except matters relating to Contractor, subcontractor or supplier potential claims not actionable against the Department as specified in these special provisions or quantification of disputes for overhead type expenses or costs. Disputes for overhead type expenses or costs shall conform to the requirements of Section 9-1.07B, "Final Payment and Claims," of the Standard Specifications. Whenever the term "dispute" or "disputes" is used herein, it shall be deemed to include potential claims as well as disputes.

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

SELECTION PROCESS, DISCLOSURE AND APPOINTMENTS

The DRB shall consist of one member selected by the State and approved by the Contractor, one member selected by the Contractor and approved by the State, and a third member selected by the first 2 members and approved by both the State and the Contractor. The third member shall act as the DRB Chairperson.

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

The State and the Contractor shall nominate and approve DRB members in conformance with the terms and conditions of the Dispute Review Board Agreement and these special provisions, within 45 days of the approval of the contract. Each party shall provide written notification to the other of the name of their selected DRB nominee along with the prospective member's complete written disclosure statement.

Disclosure statements shall include a resume of the prospective member's experience and a declaration statement describing past, present, anticipated, and planned relationships, including indirect relationships through the prospective member's primary or full-time employer, to this project and with the parties involved in this construction contract, including but not limited to, relevant subcontractors or suppliers to the parties, parties' principals, or parties' counsel. DRB members shall also include a full disclosure of close professional or personal relationships with all key members of the contract. Objections to nominees must be based on a specific breech or violation of nominee responsibilities or on nominee qualifications under these provisions unless otherwise specified. The Contractor or the State may, on a one-time basis, object to the other's nominee without specifying a reason and this person will not be selected for the DRB. Another person shall then be nominated within 15 days.

The first duty of the State and Contractor selected members of the DRB shall be to select and recommend a prospective third DRB member to the parties for final selection and approval. The first 2 DRB members shall proceed with the selection of the third DRB member immediately upon receiving written notification from the State of their selection, and shall provide their recommendation simultaneously to the parties within 15 days of the notification.

The first 2 DRB members shall select a third DRB member subject to mutual approval of the parties or may mutually concur on a list of potentially acceptable third DRB members and submit the list to the parties for final selection and approval of the third member. The goal in the selection of the third member is to complement the professional experience of the first 2 members and to provide leadership for the DRB's activities.

The third prospective DRB member shall supply a full disclosure statement to the first 2 DRB members and to the parties prior to appointment.

An impasse shall be considered to have been reached if the parties are unable to approve a third member within 15 days of receipt of the recommendation of the first 2 DRB members, or if the first 2 DRB members are unable to agree upon a recommendation within their 15 day time limit. In the event of an impasse in selection of third DRB member the State and the Contractor shall each propose 3 candidates for the third DRB member position. The parties shall select the candidates proposed under this paragraph from the current list of arbitrators certified by the Public Works Contract Arbitration Committee created by Article 7.2 (commencing with Section 10245) of the State Contract Act. The first 2 DRB members shall then select one of the 6 proposed candidates in a blind draw.

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

A. Compensation for services on this DRB.
B. Ownership interest in a party or parties, documented by the prospective DRB member, that has been reviewed and determined in writing by the State to be sufficiently insignificant to render the prospective member acceptable to the State.
C. Service as a member of other Dispute Review Boards on other contracts.
D. Retirement payments or pensions received from a party that are not tied to, dependent on or affected by the net worth of the party.
E. The above provisions apply to parties having a financial interest in this contract, including but not limited to contractors, subcontractors, suppliers, consultants, and legal and business services.

The Contractor or the State may reject any of the three DRB members who fail to fully comply at all times with all required employment and financial disclosure conditions of DRB membership as described in the Dispute Review Board Agreement and as specified herein. A copy of the Dispute Review Board Agreement is included in this section.

The Contractor, the State, and the 3 members of the DRB shall complete and adhere to the Dispute Review Board Agreement in administration of this DRB within 15 days of the parties' concurrence in the selection of the third member. No DRB meeting shall take place until the Dispute Review Board Agreement has been signed by all parties. The State authorizes the Engineer to execute and administer the terms of the Agreement. The person(s) designated by the Contractor as authorized to execute contract change orders shall be authorized to execute and administer the terms of this agreement, or to delegate the authority in writing. The operation of the DRB shall be in conformance with the terms of the Dispute Review Board Agreement.

COMPENSATION

The State and the Contractor shall bear the costs and expenses of the DRB equally. Each DRB member shall be compensated at an agreed rate of $1,200 per day if time spent per meeting, including on-site time plus one hour of travel time, is greater than 4 hours. Each DRB member shall be compensated at an agreed rate of $700 per day if time spent per meeting, including on-site time plus one hour of travel time, is less than or equal to 4 hours. The agreed rates shall be considered full compensation for on-site time, travel expenses, transportation, lodging, time for travel and incidentals for each day, or portion thereof, that the DRB member is at an authorized DRB meeting. No additional compensation will be made for time spent by DRB members in review and research activities outside the official DRB meetings unless that time, (such as time spent evaluating and preparing recommendations on specific issues presented to the DRB), has been specifically agreed to in advance by the State and Contractor. Time away from the project, which has been specifically agreed to in advance by the parties, will be compensated at an agreed rate of $125 per hour. The agreed amount of $125 per hour shall include all incidentals including expenses for telephone, fax, and computer services. Members serving on more than one DRB involving the Department, regardless of the number of meetings per day, shall not be paid more than the all inclusive rate per day or rate per hour for an individual project. The State will provide, at no cost to the Contractor, administrative services such as conference facilities and secretarial services to the DRB. These special provisions and the Dispute Review Board Agreement state the provisions for compensation and expenses of the DRB. DRB members shall be compensated at the same daily and hourly rate. The Contractor shall make direct payments to each DRB member for their participation in authorized meetings and approved hourly rate charges from invoices submitted by each DRB member. The State will reimburse the Contractor for the State's share of the costs. There will be no markups applied to expenses connected with the DRB, either by the DRB members or by the Contractor when requesting payment of the State's share of DRB expenses. Regardless of the DRB recommendation, neither party shall be entitled to reimbursement of DRB costs from the other party.

REPLACEMENT OF DRB MEMBERS

Service of a DRB member may be terminated at any time with not less than 15 days notice as follows:

A. The State may terminate service of the State appointed member.
B. The Contractor may terminate service of the Contractor appointed member.
C. Upon the written recommendation of the State and Contractor appointed members for the removal of the third member.
D. Upon resignation of a member.
E. The State or Contractor may terminate the service of any member who fails to fully comply with all required employment and financial disclosure conditions of DRB membership

When a member of the DRB is replaced, the replacement member shall be appointed in the same manner as the replaced member was appointed. The appointment of a replacement DRB member will begin promptly upon determination of the need for replacement and shall be completed within 15 days. Changes in either of the DRB members chosen by the two parties will not require re-selection of the third member, unless both parties agree to such re-selection in writing. The Dispute Review Board Agreement shall be amended to reflect the change of a DRB member.

OPERATION

The following procedure shall be used for dispute resolution:

A. If the Contractor objects to any decision, act or order of the Engineer, the Contractor shall give written notice of potential claim in conformance with the provisions in Section 9-1.04, "Notice of Potential Claim," of the Standard Specifications and these special provisions, including the provision of applicable cost documentation; or file written protests or notices in conformance with the provisions in the Standard Specifications and these special provisions.
B. The Engineer will respond, in writing, to the Contractor's written supplemental notice of potential claim within 20 days of receipt of the notice.
C. Within 15 days after receipt of the Engineer's written response, the Contractor shall, if the Contractor still objects, file a written reply with the Engineer, stating clearly and in detail the basis of the objection.
D. Following an objection to the Engineer's written response, the Contractor shall refer the dispute to the DRB if the Contractor wishes to further pursue the objection to the Engineer's decision. The Contractor shall make the referral in writing to the DRB, simultaneously copied to the State, within 21 days after receipt of the written response from the Engineer. The written dispute referral shall describe the disputed matter in individual discrete segments so that it will be clear to both parties and the DRB what discrete elements of the dispute have been resolved, and which remain unresolved, and shall include an estimate of the cost of the affected work and impacts, if any, on project completion.
E. By failing to submit the written notice of referral to the DRB, within 21 days after receipt of the Engineer's written response to the supplemental notice of potential claim, the Contractor waives future claims and arbitration on the matter in contention.
F. The Contractor and the State shall each be afforded an opportunity to be present and to be heard by the DRB, and to offer evidence. Either party furnishing written evidence or documentation to the DRB must furnish copies of such information to the other party a minimum of 15 days prior to the date the DRB is scheduled to convene the meeting for the dispute. Either party shall produce such additional evidence as the DRB may deem necessary to reach an understanding and a determination of the dispute. The party furnishing additional evidence shall furnish copies of such additional evidence to the other party at the same time the evidence is provided to the DRB. The DRB shall not consider evidence not furnished in conformance with the terms specified herein.
G. Upon receipt by the DRB of a written referral of a dispute, the DRB shall convene to review and consider the dispute. The dispute meeting shall be held no earlier than 30 days and no later than 60 days after receipt of the written referral unless otherwise agreed to by all parties. The DRB shall determine the time and location of the DRB dispute meeting, with due consideration for the needs and preferences of the parties while recognizing the paramount importance of a timely hearing of the dispute.
H. There shall be no participation of either party's attorneys at DRB dispute meetings.
I. There shall be no participation of persons who are not directly involved in the contract or who do not have direct knowledge of the dispute, including but not limited to consultants, except for expert testimony allowed at the discretion of the DRB and with approval prior to the dispute meeting by both parties.
J. The DRB shall furnish a report, containing findings and recommendations as described in the Dispute Review Board Agreement, in writing to both the State and the Contractor. The DRB may request clarifying information of either party within 10 days after the DRB dispute meeting. Requested information shall be submitted to the DRB within 10 days of the DRB request. The DRB shall complete its report, including minority opinion, if any, and submit it to the parties within 30 days of the DRB dispute meeting, except that time extensions may be granted at the request of the DRB with the written concurrence of both parties. The report shall include the facts and circumstances related to the matters under consideration, pertinent provisions of the contract, applicable laws and regulations, and actual costs and time incurred as shown on the Contractor's cost accounting records. The DRB shall make recommendations on the merit of the dispute and, if appropriate, recommend guidelines for determining compensation.
K. Within 30 days after receiving the DRB's report, both the State and the Contractor shall respond to the DRB in writing signifying that the dispute is either resolved or remains unresolved. Failure to provide the written response within the time specified, or a written rejection of the DRB's recommendation or response to a request for reconsideration presented in the report by either party, shall conclusively indicate that the party(s) failing to respond

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

L. The DRB's recommendations, stated in the DRB's reports, are not binding on either party. Either party may seek a reconsideration of a recommendation of the DRB. The DRB shall only grant a reconsideration based upon submission of new evidence and if the request is submitted within the 30-day time limit specified for response to the DRB's written report. Each party may submit only one request for reconsideration regarding an individual DRB recommendation.

M. If the State and the Contractor are able to resolve their dispute with the aid of the DRB's report, the State and Contractor shall promptly accept and implement the recommendations of the DRB. If the parties cannot agree on compensation within 60 days of the acceptance by both parties of the DRB's recommendation, either party may request the DRB to make a recommendation regarding compensation.

N. The State or the Contractor shall not call DRB members who served on the DRB for this contract as witnesses in arbitration proceedings which may arise from this contract, and all documents created by the DRB shall be inadmissible as evidence in subsequent arbitration proceedings, except the DRB's final written reports on each issue brought before it.

O. The State and Contractor shall jointly indemnify and hold harmless the DRB members from and against all claims, damages, losses, and expenses, including but not limited to attorney's fees, arising out of and resulting from the findings and recommendations of the DRB.

P. The DRB members shall have no claim against the State or the Contractor, or both, from claimed harm arising out of the parties' evaluations of the DRB's report.

DISPUTES INVOLVING SUBCONTRACTOR POTENTIAL CLAIMS

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

A. The Contractor shall identify clearly in submissions pursuant to this section, that portion of the dispute that involves a subcontractor potential claim or potential claims.

B. The Contractor shall include, as part of its submission pursuant to Step D above, a certification (False Claims Act Certification) by the subcontractor's or supplier's officer, partner, or authorized representative with authority to bind the subcontractor and with direct knowledge of the facts underlying the subcontractor potential claim. The Contractor shall submit a certification that the subcontractor potential claim is acknowledged and forwarded by the Contractor. The form for these certifications is available from the Engineer.

C. At DRB dispute meetings involving one or more subcontractor potential claims, the Contractor shall require that each subcontractor involved in the dispute have present an authorized representative with actual knowledge of the facts underlying the subcontractor potential claim to assist in presenting the subcontractor potential claim and to answer questions raised by the DRB members or the Department's representatives.

D. Failure by the Contractor to declare a subcontractor potential claim on behalf of its subcontractor (including lower tier subcontractors' and suppliers' pass through potential claims) at the time of submission of the Contractor's potential claims, as provided hereunder, shall constitute a release of the State by the Contractor of such subcontractor potential claim.

E. The Contractor shall include in all subcontracts under this contract that subcontractors and suppliers of any tier (a) agree to submit subcontractor potential claims to the Contractor in a proper form and in sufficient time to allow processing by the Contractor in conformance with the Dispute Review Board resolution specifications; (b) agree to be bound by the terms of the Dispute Review Board provisions to the extent applicable to subcontractor potential claims; (c) agree that, to the extent a subcontractor potential claim is involved, completion of all steps required under these Dispute Review Board special provisions shall be a condition precedent to pursuit by the subcontractor of other remedies permitted by law, including without limitation of a lawsuit against the Contractor; and (d) agree

that the existence of a dispute resolution process for disputes involving subcontractor potential claims shall not be deemed to create any claim, right, or cause of action by any subcontractor or supplier against the Department.

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

RETENTION

Failure of the Contractor to nominate and approve DRB members in conformance with the terms and conditions of the Dispute Review Board Agreement and these special provisions shall result in the retention of 25 percent of the estimated value of all work performed during each estimate period in which the Contractor fails to comply with the requirements of this section as determined by the Engineer. DRB retentions will be released for payment on the next monthly estimate for partial payment following the date that the Contractor has nominated and approved DRB members and no interest will be due the Contractor.

DISPUTE REVIEW BOARD AGREEMENT

A copy of the "Dispute Review Board Agreement" to be executed by the Contractor, State and the 3 DRB members after approval of the contract follows:

Form 6202 Rev (09/01/02)

DISPUTE REVIEW BOARD AGREEMENT

_____
(Contract Identification)

Contract No. _____

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

_____ ,
(Contractor Appointee)

_____ ,
(State Appointee)

and _____
(Third Person)

WITNESSETH, that

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

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

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

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

SECTION I DESCRIPTION OF WORK

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

SECTION II SCOPE OF WORK

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

A. OBJECTIVE

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

B. PROCEDURES

The DRB shall render written reports on disputes between the parties arising from the construction contract. Prior to consideration of a dispute, the DRB shall establish rules and regulations that will govern the conduct of its business and reporting procedures in conformance with the requirements of the contract and the terms of this AGREEMENT. DRB recommendations, resulting from its consideration of a dispute, shall be furnished in writing to both parties. The recommendations shall be based on facts and circumstances involved in the dispute, pertinent contract provisions, applicable laws and regulations. The recommendations shall find one responsible party in a dispute; shared or "jury" determinations shall not be rendered. The DRB shall make recommendations on the merit of the dispute, and if appropriate, recommend guidelines for determining compensation. If the parties cannot agree on compensation within 60 days of the acceptance by both parties of the DRB's recommendation, either party may request the DRB to make a recommendation regarding compensation.

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

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

C. CONSTRUCTION SITE VISITS, PROGRESS MEETINGS AND FIELD INSPECTIONS

The DRB members shall visit the project site and meet with representatives of the parties to keep abreast of construction activities and to develop familiarity with the work in progress. Scheduled progress meetings shall be held at or near the project site. The DRB shall meet at least once at the start of the project, and at least once every 4 months thereafter. The frequency, exact time, and duration of additional site visits and progress meetings shall be as recommended by the DRB and approved by the parties consistent with the construction activities or matters under consideration and dispute. Each meeting shall consist of a round table discussion and a field inspection of the work being performed on the contract, if necessary. Each meeting shall be attended by representatives of both parties. The agenda shall generally be as follows:

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

The STATE's representative will prepare minutes of all progress meetings and circulate them for revision and approval by all concerned within 10 days of the meeting.

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

D. DRB CONSIDERATION AND HANDLING OF DISPUTES

Upon receipt by the DRB of a written referral of a dispute, the DRB shall convene to review and consider the dispute. The dispute meeting shall be held no earlier than 30 days and no later than 60 days after receipt of the written referral, unless otherwise agreed to by all parties. The DRB shall determine the time and location of DRB dispute meetings, with due consideration for the needs and preferences of the parties while recognizing the paramount importance of speedy resolution of issues. No dispute meetings shall take place later than 30 days prior to acceptance of contract.

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

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

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

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

The third DRB member shall act as Chairperson for dispute meetings and all other DRB activities. The parties shall have a representative at all dispute meetings. Failure to attend a duly noticed dispute meeting by either of the parties shall be conclusively considered by the DRB as indication that the non-attending party considers written submittals as their entire and complete argument. The claimant shall discuss the dispute, followed by the other party. Each party shall then be allowed one or more rebuttals until all aspects of the dispute are thoroughly covered. DRB members shall ask questions, seek clarification, and request further data from either of the parties as may be necessary to assist in making a fully informed recommendation. The DRB may request from either party documents or information that would assist the DRB in making its findings and recommendations including, but not limited to, documents used by the CONTRACTOR in preparing the bid for the project. A refusal by a party to provide information requested by the DRB may be considered by the DRB as an indication that the requested material would tend to disprove that party's position. In large or complex cases, additional dispute meetings may be necessary in order to consider all the evidence presented by both parties. All involved parties shall maintain the confidentiality of all documents and information, as provided in this AGREEMENT.

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

After dispute meetings are concluded, the DRB shall meet in private and reach a conclusion supported by 2 or more members. Private sessions of the DRB may be held at a location other than the job site or by electronic conferencing as deemed appropriate, in order to expedite the process.

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

With prior written approval of both parties, the DRB may obtain technical services necessary to adequately review the disputes presented, including audit, geotechnical, schedule analysis and other services. The parties' technical staff may supply those services as appropriate. The cost of technical services, as agreed to by the parties, shall be borne equally by the 2 parties as specified in an approved contract change order. The CONTRACTOR will not be entitled to markups for the payments made for these services.

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

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

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

E. DRB MEMBER REPLACEMENT

Should the need arise to appoint a replacement DRB member, the replacement DRB member shall be appointed in the same manner as the original DRB members were appointed. The selection of a replacement DRB member shall begin promptly upon notification of the necessity for a replacement and shall be completed within 15 days. This AGREEMENT shall be amended to indicate change in DRB membership.

SECTION III CONTRACTOR RESPONSIBILITIES

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

SECTION IV STATE RESPONSIBILITIES

The STATE will furnish the following services and items:

A. CONTRACT RELATED DOCUMENTS

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

B. COORDINATION AND SERVICES

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

SECTION V TIME FOR BEGINNING AND COMPLETION

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

SECTION VI PAYMENT

A. ALL INCLUSIVE RATE PAYMENT

The STATE and the CONTRACTOR shall bear the costs and expenses of the DRB equally. Each DRB member shall be compensated at an agreed rate of $1,200 per day if time spent per meeting, including on-site time plus one hour of travel time, is greater than 4 hours. Each DRB member shall be compensated at an agreed rate of $700 per day if time spent per meeting, including on-site time plus one hour of travel time, is less than or equal to 4 hours. The agreed rates shall be considered full compensation for on-site time, travel expenses, transportation, lodging, time for travel and incidentals for each day, or portion thereof, that the DRB member is at an authorized DRB meeting. No additional compensation will be made for time spent by DRB members in review and research activities outside the official DRB meetings unless that time has been specifically agreed to in advance by the STATE and CONTRACTOR. Time away from the project that has been specifically agreed to in advance by the parties will be compensated at an agreed rate of $125 per hour. The agreed amount of $125 per hour shall include all incidentals including expenses for telephone, fax, and computer services. Members serving on more than one DRB involving the State, regardless of the number of meetings per day, shall not be paid more than the all inclusive rate per day or rate per hour for an individual project. The STATE will provide, at no cost to the CONTRACTOR, administrative services such as conference facilities and secretarial services to the DRB.

B. PAYMENTS

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

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

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

C. INSPECTION OF COSTS RECORDS

The DRB members and the CONTRACTOR shall keep available for inspection by representatives of the STATE and the United States, for a period of 3 years after final payment, the cost records and accounts pertaining to this AGREEMENT. If any litigation, claim, or audit arising out of, in connection with, or related to this contract is initiated before the expiration of the 3-year period, the cost records and accounts shall be retained until such litigation, claim, or audit involving the records is completed.

SECTION VII ASSIGNMENT OF TASKS OF WORK

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

SECTION VIII TERMINATION OF DRB MEMBERS

DRB members may resign from the DRB by providing not less than 15 days written notice of the resignation to the STATE and CONTRACTOR. DRB members may be terminated by their original appointing power or by either party, for failing to fully comply at all times with all required employment and financial disclosure conditions of DRB membership in conformance with the terms of the contract.

SECTION IX LEGAL RELATIONS

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

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

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

SECTION X CONFIDENTIALITY

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

SECTION XI DISPUTES

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

SECTION XII VENUE, APPLICABLE LAW, AND PERSONAL JURISDICTION

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

SECTION XIII FEDERAL REVIEW AND REQUIREMENTS

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

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

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

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

DRB MEMBER

By: _____

Title: _____

DRB MEMBER

By: _____

Title :_____

DRB MEMBER

By :_____

Title :_____

CONTRACTOR

By: _____

Title: _____

CALIFORNIA STATE DEPARTMENT
OF TRANSPORTATION

By: _____

Title: _____

5-1.13 FORCE ACCOUNT PAYMENT

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

Attention is directed to "Time-Related Overhead" of these special provisions.

To the total of the direct costs for work performed on a force account basis, computed as provided in Sections 9-1.03A(1), "Labor," 9-1.03A(2), "Materials," and 9-1.03A(3), "Equipment Rental," of the Standard Specifications, there will be added the following markups:

Cost	Percent Markup
Labor	28
Materials	10
Equipment Rental	10

The above markups shall be applied to work performed on a force account basis, regardless of whether the work revises the current contract completion date.

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

Full compensation for overhead costs for work performed on a force account basis, and for which no adjustment is made to the quantity for time-related overhead conforming to the provisions in "Time-Related Overhead" of these special provisions, shall be considered as included in the markups specified above, and no additional compensation will be allowed therefor.

When extra work to be paid for on a force account basis is performed by a subcontractor, approved in conformance with the provisions in Section 8-1.01, "Subcontracting," of the Standard Specifications, an additional markup of 7 percent will be added to the total cost of that extra work including all markups specified in this section "Force Account Payment". The additional 7 percent markup shall reimburse the Contractor for additional administrative costs, and no other additional payment will be made by reason of performance of the extra work by a subcontractor.

5-1.14 COMPENSATION ADJUSTMENTS FOR PRICE INDEX FLUCTUATIONS

The provisions of this section shall apply only to the following contract items:

ITEM CODE	ITEM
390152	ASPHALT CONCRETE
290211	ASPHALT TREATED PERMEABLE BASE

The compensation payable for asphalt concrete and asphalt treated permeable base will be increased or decreased in conformance with the provisions of this section for paving asphalt price fluctuations exceeding 10 percent (Iu/Ib is greater than 1.10 or less than 0.90) which occur during performance of the work.

The adjustment in compensation will be determined in conformance with the following formulae when the item of asphalt concrete or asphalt treated permeable base (or both) is included in a monthly estimate:

A. Total monthly adjustment = AQ

B. For an increase in paving asphalt price index exceeding 10 percent:

$$A = 0.90\ (1.1023)\ (Iu/Ib - 1.10)\ Ib$$

C. For a decrease in paving asphalt price index exceeding 10 percent:

$$A = 0.90\ (1.1023)\ (Iu/Ib - 0.90)\ Ib$$

D. Where:

A = Adjustment in dollars per tonne of paving asphalt used to produce asphalt concrete and asphalt treated permeable base rounded to the nearest $0.01.

Iu = The California Statewide Paving Asphalt Price Index which is in effect on the first business day of the month within the pay period in which the quantity subject to adjustment was included in the estimate.

Ib = The California Statewide Paving Asphalt Price Index for the month in which the bid opening for the project occurred.

Q = Quantity in tonnes of paving asphalt that was used in producing the quantity of asphalt concrete shown under "This Estimate" on the monthly estimate using the amount of asphalt determined by the Engineer plus the quantity in tonnes of paving asphalt that would have been used in producing the quantity of asphalt treated permeable base shown under "This Estimate" on the monthly estimate using the amount of asphalt specified in the specifications.

The adjustment in compensation will also be subject to the following:

A. The compensation adjustments provided herein will be shown separately on payment estimates. The Contractor shall be liable to the State for decreased compensation adjustments and the Department may deduct the amount thereof from any moneys due or that may become due the Contractor.
B. Compensation adjustments made under this section will be taken into account in making adjustments in conformance with the provisions in Section 4-1.03B, "Increased or Decreased Quantities," of the Standard Specifications.
C. In the event of an overrun of contract time, adjustment in compensation for paving asphalt included in estimates during the overrun period will be determined using the California Statewide Paving Asphalt Price Index in effect on the first business day of the month within the pay period in which the overrun began.

The California Statewide Paving Asphalt Price Index is determined each month on the first business day of the month by the Department using the median of posted prices in effect as posted by Chevron, Mobil, and Unocal for the Buena Vista, Huntington Beach, Kern River, Long Beach, Midway Sunset, and Wilmington fields.

In the event that the companies discontinue posting their prices for a field, the Department will determine an index from the remaining posted prices. The Department reserves the right to include in the index determination the posted prices of additional fields.

5-1.15 AREAS FOR CONTRACTOR'S USE

Attention is directed to the provisions in Section 7-1.19, "Rights in Land and Improvements," of the Standard Specifications and these special provisions.

The highway right of way shall be used only for purposes that are necessary to perform the required work. The Contractor shall not occupy the right of way, or allow others to occupy the right of way, for purposes which are not necessary to perform the required work.

No State-owned parcels adjacent to the right of way are available for the exclusive use of the Contractor within the contract limits. The Contractor shall secure, at the Contractor's own expense, areas required for plant sites, storage of equipment or materials, or for other purposes.

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, and the State shall not be held liable for damage to or loss of materials or equipment located within such areas.

5-1.16 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.

For the purpose of making partial payments pursuant to Section 9-1.06, "Partial Payments," of the Standard Specifications, the amount set forth for the contract items of work hereinafter listed shall be deemed to be the maximum value of the contract item of work which will be recognized for progress payment purposes:

A. Clearing and Grubbing	$	207 000.00
B. Develop Water Supply	$	45 000.00
C. Progress Schedule (Critical Path Method)	$	4 500.00

After acceptance of the contract pursuant to the provisions in Section 7-1.17, "Acceptance of Contract," of the Standard Specifications, the amount, if any, payable for a contract item of work in excess of the maximum value for progress payment purposes hereinabove listed for the item, will be included for payment in the first estimate made after acceptance of the contract.

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. Alternative Pipe Culvert
B. Pavement Markers
C. Edge Drain Pipe
D. Underdrain Pipe
E. Alternative Pipe Downdrain and Appurtenances
F. Alternative Flared End Section
G. Rock Slope Protection Fabric
H. Fences and Gates
I. Miscellaneous Iron and Steel
J. Miscellaneous Metal (Bridge)
K. Metal Beam Guard Railing and Appurtenances
L. Bar Reinforcing Steel
M. Signal and Lighting Standards
N. Signal Heads and Mounting Brackets
O. Piling
P. Prestressing steel in sealed containers
Q. Prestressing anchorage and ducts
R. Tiedown anchors
S. Joint seal assemblies
T. Reinforced Concrete Pipe
U. Luminaires

5-1.17 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.

5-1.18 HIGHWAY CONSTRUCTION EQUIPMENT

The first paragraph of Section 7-1.01D, "Vehicle Code," of the Standard Specifications shall not apply.

Pursuant to the authority contained in Section 591 of the Vehicle Code, the Department has determined that, within such areas as are within the limits of the project and are open to public traffic, the following requirements of the Vehicle Code will apply: the lighting requirements in Section 25803; the brake requirements in Chapter 3, Division 12; the splash apron requirements in Section 27600; and, when operated on completed or existing treated base, surfacing, pavement or structures, except as otherwise provided in Section 7-1.02, "Load Limitations," of the Standard Specifications, the weight limitation requirements contained in Division 15.

5-1.19 RELATIONS WITH CALIFORNIA DEPARTMENT OF FISH AND GAME

A portion of this project is located within the jurisdiction of the California Department of Fish and Game. An agreement regarding a stream or lake has been entered into by the Department of Transportation and the Department of Fish and Game. The Contractor shall be fully informed of the requirements of this agreement as well as rules, regulations, and conditions that may govern the Contractor's operations in these areas and shall conduct the work accordingly.

Copies of the agreement may be obtained at the Department of Transportation, Plans and Bid Documents Section, MS 26, 1120 N Street, Room 200, Sacramento, CA 95814, Telephone 916-654-4490, and are available for inspection at the office of the District Director of Transportation at 1976 E. Charter Way, Stockton, CA 95205.

It is unlawful for any person to divert, obstruct or change the natural flow of the bed, channel or bank of a stream, river or lake without first notifying the Department of Fish and Game, unless the project or activity is noticed and constructed in conformance with conditions imposed under Fish and Game Code Section 1601.

Attention is directed to Sections 7-1.01, "Laws to be Observed," 7-1.01G, "Water Pollution," and 7-1.12, "Indemnification and Insurance," of the Standard Specifications.

Modifications to the agreement between the Department of Transportation and the Department of Fish and Game which are proposed by the Contractor shall be submitted in writing to the Engineer for transmittal to the Department of Fish and Game for their consideration.

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

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

Modifications to any agreement between the Department of Transportation and the Department of Fish and Game will be fully binding on the Contractor. The provisions of this section shall be made a part of every subcontract executed pursuant to this contract.

5-1.20 RELATIONS WITH CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD

The location of the Amador 49 Bypass Project is within an area controlled by the Regional Water Quality Control A Board. Regional Water Quality Control Board Order permit has been issued covering work to be performed under this contract. The Contractor shall be fully informed of rules, regulations, and conditions that may govern the Contractor's operations in the areas and shall conduct the work accordingly.

Copies of the permit may be obtained at the Department of Transportation, Plans and Bid Documents Section, MS 26, 1120 N Street, Room 200, Sacramento, CA 95814, Telephone 916-654-4490, and are available for inspection at the office of the District Director of Transportation at 1976 E. Charter Way, Stockton, CA 95205.

Attention is directed to Section 7-1.11, "Preservation of Property," and Section 7-1.12, "Indemnification and Insurance," of the Standard Specifications.

Changes in the above listed conditions proposed by the Contractor shall be submitted to the Engineer for transmittal to the Regional Water Quality Control Board for their approval. Changes shall not be implemented until approved in writing by the Regional Water Quality Control Board.

Attention is directed to Section 8-1.06, "Time of Completion," of the Standard Specifications. Days when the Contractor's operations are restricted by the requirements of this section shall not be considered to be nonworking days whether or not the controlling operation is delayed.

5-1.21 RELATIONS WITH ARMY CORPS OF ENGINEERS

A portion of this project is located within the jurisdiction of the Army Corps of Engineers. The Contractor shall be fully informed of the requirements of this agreement as well as rules, regulations, and conditions that may govern the Contractor's operations in these areas and shall conduct the work accordingly.

Copies of the agreement may be obtained at the Department of Transportation, Plans and Bid Documents Section, MS 26, 1120 N Street, Room 200, Sacramento, CA 95814, Telephone 916-654-4490, and are available for inspection at the office of the District Director of Transportation at 1976 E. Charter Way, Stockton, CA 95205.

Attention is directed to Sections 7-1.01, "Laws to be Observed," 7-1.01G, "Water Pollution," and 7-1.12, "Indemnification and Insurance," of the Standard Specifications.

Modifications to the agreement between the Department of Transportation and the Army Corps of Engineers which are proposed by the Contractor shall be submitted in writing to the Engineer for transmittal to the Army Corps of Engineers for their consideration.

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

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

Modifications to any agreement between the Department of Transportation and the Army Corps of Engineerswill be fully binding on the Contractor. The provisions of this section shall be made a part of every subcontract executed pursuant to this contract.

5-1.22 FIRE PLAN

The Contractor shall cooperate with local fire prevention authorities in eliminating hazardous fire conditions and shall implement the following fire plan under the direction of the Engineer:

A. The Contractor shall be responsible for:

1. obtaining the phone number of the nearest fire suppression agency and providing this phone number to the Engineer as a first order of work,
2. immediately reporting to the nearest fire suppression agency fires occurring within the limits of the project,
3. preventing project personnel from setting open fires not part of the work, unless the Fire Index is at "Low," or the determination of the Fire Index is suspended or, if in an area not covered by the Fire Index rating system, the Engineer determines that the fire hazard is negligible,
4. preventing the escape of fires caused directly or indirectly as a result of project operations and extinguishing these fires.

B. Except for motor trucks, truck tractors, buses and passenger vehicles, the Contractor shall equip all hydro-carbon fueled engines, both stationary and mobile, including motorcycles, with spark arresters that meet United States Forest Service Standards as specified in the Forest Service Spark Arrester Guide and shall maintain the spark arresters in good operating condition. Spark arresters are not required by the State Department of Forestry or the United States Forest Service on equipment powered by properly maintained exhaust-driven turbo-charged engines or when equipped with scrubbers with properly maintained water levels. The Forest Service Spark Arrester Guide is available at the District Offices of the Department of Transportation.

C. Toilets shall have a metal receptacle, at least 150 mm in diameter by 200 mm deep, half-filled with sand for ashes and discarded smokes, and within easy reach of anyone utilizing the facility.

D. Equipment service areas, parking areas and gas and oil storage areas shall be located so that there is no flammable material within a radius of at least 15 m of these areas. Small mobile or stationary engine sites shall be cleared of flammable material for a radius of at least 4.6 m from the engine.

E. The areas to be cleared and grubbed shall be cleared, and kept clear of, flammable material such as dry grass, weeds, brush, downed trees, oily rags and waste, paper, cartons, and plastic waste. The first order of work shall be to clear a fire break at the outer limits of the areas to be cleared and grubbed. Other fire breaks may be ordered by the Engineer and will be paid for as extra work as provided in Section 4-1.03D of the Standard Specifications.

F. The Contractor shall furnish each piece of equipment with the following:

1. one shovel and one fully charged fire extinguisher UL rated at 4 B:C or more on each truck, personnel vehicle tractor, grader or other heavy equipment,
2. one shovel and one back-pack 20-L water-filled tank with pump for each welder,
3. one shovel or one chemical pressurized fire extinguisher, fully charged, for each gasoline-powered tool, including but not limited to chain saws, soil augers, rock drills, etc. The required fire tools shall, at no time, be farther than 8 m from the point of operation of the power tool. Fire extinguishers shall be of the type and size required by the California Public Resource Code, Section 4431, and the California Administrative Code, Title 14, Section 1234,
4. shovels shall be size "O" or larger and shall be not less than 1.2 m in length.

G. The Contractor shall furnish a pickup truck and driver for the sole purpose of fire control during working hours and as specified herein.

1. The truck shall be equipped with 10 shovels, 5 axes, 2 back-pack 20-L water-filled tanks with pumps, or other fire tools substituted on a one to one basis at the option of the Contractor and approved by the Engineer.
2. The truck shall be equipped with a 380-L tank of water with a gasoline motor powered pump and 30 m of 19-mm hose on a reel.
3. In addition to being available at the site of the work, the truck and operator shall patrol the area of construction from noon until one-half hour after shutdown of the work. If the Fire Index is "Very High" or "Extreme," truck and operator shall patrol the area of construction while work is being done and for at least one-half hour after shutdown of work.

H. The Contractor shall be aware of the Fire Index and conform to the following:

1. The Wild Land Fire Danger Rating System established by the United States Forest Service and the State of California Department of Forestry is designed to estimate the relative effect of weather on the several aspects of fire behavior, such as spread, intensity, and ignition.
2. The combination of these effects makes up the Fire Index, the severity of which is as follows:

LOW MEDIUM HIGH VERY HIGH EXTREME

3. Arrangements have been made with the United States Forest Service and the Department of Forestry to notify the Department of Transportation when the Fire Index is "Very High" or "Extreme" within numbered Fire Danger areas as shown on maps furnished by the Department of Transportation. This information will be furnished to the Engineer, who will notify the Contractor for dissemination and action in the area affected.
4. When the Fire Index reaches "Very High," the following conditions will prevail:

Falling of dead trees or snags shall be discontinued.
No open burning will be permitted; fires shall be extinguished.
Welding shall be discontinued except in an enclosed building or within an area cleared of flammable material for a radius of 4.6 m.
Blasting shall be discontinued.
Smoking will be permitted only in automobiles and cabs of trucks equipped with an ashtray or in cleared areas immediately surrounded by a fire break, unless prohibited by other authority.
Vehicular travel will be restricted to cleared areas except in case of emergency.

5. When the Fire Index reaches "Extreme," the following precautions shall be taken in addition to the conditions specified above:

Work of a nature which could start a fire shall require that properly equipped fire guard(s) be assigned to such an operation for the duration of the work.
Smoking will be permitted only in automobiles and truck cabs equipped with an ashtray, unless prohibited by other authority.

Following is the average percent probability of occurrence of Fire Index ratings of "Very High" and "Extreme" for the project area. These averages are based on 10 years of recorded data. The State does not expressly or by implication predict that the actual occurrence of hazardous fire days for a given year will correspond with these average probabilities.

	Percent Probability	
Project Area	Very High	Extreme
42	16	5

If the project is shut down or partially shut down on account of hazardous fire conditions, working days during such period will be determined in the same manner as provided in Section 8-1.06, "Time of Completion," of the Standard Specifications for shutdowns due to weather.

If field and weather conditions become such that the determination of the Fire Index is suspended, the provisions under items "G" and "H" of this section will not be enforced for the period of the suspension of the determination of the Fire Index. The Engineer will notify the Contractor of the dates of the suspension and resumption of the determination of the Fire Index.

Full compensation for conforming to the provisions herein shall be considered as included in the prices paid for the various contract items of work and no separate payment will be made therefor.

5-1.23 ENVIRONMENTALLY SENSITIVE AREA

Attention is directed to the designated Environmentally Sensitive Areas (ESAs) shown on the plans. The exact location of the boundaries of ESAs will be determined by the Engineer and shall be clearly delineated by the placement of temporary fence (Type ESA) as specified in these special provisions.

Complete report, entitled "Preliminary Site Investigation Report for Title 22 Metals and Cyanide, State Route 49 Sutter Creek Bypass Project, Amador County, California," is available for inspection at the Department of Transportation, at 1976 E. Charter Way, Stockton, CA 95205, Telephone 209-498-7399.

Attention is directed to "Archaeological Monitoring" of these special provisions regarding the presence of archaeological monitor and Native American observers.

No work shall be performed within Environmentally Sensitive Areas without written authorization of the Engineer.

No work within the right of way of Amador Creek's Environmentally Sensitive Area, as shown on the plans, shall be permitted.

Vehicle access, storage or transport of materials or equipment, or other project related activities are prohibited within the boundaries of ESAs.

The Contractor shall repair, or perform work to mitigate, damage or impacts to ESAs caused by the Contractor's operations, at the Contractor's expense. If the Engineer determines repairs or mitigation work will be performed by others, or if mitigation fees are assessed the Department, deductions from moneys due or to become due the Contractor will be made for the repair or mitigation costs.

5-1.24 ARCHAEOLOGICAL MONITORING

The Contractor's attention is directed to the designated Environmentally Sensitive Areas (ESA) shown on the plans.

Within the boundaries of an ESA, as indicated on the project plans, or where designated by the Engineer, no construction or related activities, which may involve ground disturbance, are permitted without the presence of the designated Department archaeological monitor and Native American observer.

Ground disturbance includes, but is not limited to, excavation, scarification of ground surface, clearing and grubbing, grading, and auger borings.

The Contractor shall notify the Engineer at least 10 days in advance of commencing any work within the ESA. The notification shall include a schedule of the hours and days to be worked, including Saturdays, Sundays and holidays.

The Contractor shall notify the Engineer of a meeting, that the Contractor or other officer of his organization will be required to establish and participate in. The meeting will be assembled prior to the start of work on this contract, to delineate the location of the ESA on the ground and to introduce the Department monitor and Native American observer. The Contractor shall be responsible for scheduling said meeting adequately in advance of commencing construction operations, in order to comply with other requirements specified herein. The meeting shall be between 8:00 AM and 3:00 PM, Monday through Friday, except legal holidays. The Contractor shall submit a written request for said meeting to the Engineer not less than 5 days in advance of the day and time of the meeting. Additional items of discussion at the meeting shall include:

1) To have the Engineer inform the Contractor in the field of the archaeological resources located within or adjacent to the project work area.
2) To define cultural resources and to discuss action to take if cultural resources are found during construction activities.
3) To discuss laws regulating protection of cultural resources.
4) To discuss communication protocol between the engineer, contractor, archaeological monitor, and Native American observer.

The monitors, including the Native American observer, have the authority to halt construction operations in the vicinity of an archaeological find, if significant or potentially significant cultural resources are exposed or adversely affected by construction operations. Work cannot resume without the express written authorization from the Engineer.

Should human skeletal material or other archaeological finds be uncovered, the Contractor's construction activities, within 30 meters of the find, shall be halted immediately and shall not be resumed until permitted, in writing, by the Engineer.

In the event that any skeletal remain or artifact is found, and if in the opinion of the Engineer, the Contractor's operations are delayed or interfered with by reason of the skeletal remain or artifact being found, the State will compensate the Contractor for such delays to the extent provided for in Sections 8-1.09, "Right-of-Way Delays," of the Standard Specifications, and not otherwise, except as provided in section 8-1.01, "Utility and Non-Highway Facilities," of the Standard Specifications.

The Department reserves the right to use other forces for exploratory work to identify the extent of areas requiring archaeological evaluation or recovery. Contractor labor, equipment and materials required to assist the archaeologist shall be paid as extra work as provided in Section 4-1.03D of the Standard Specifications.

All archaeological materials found during project activity shall become the property of the State.

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

5-1.25 CULTURAL RESOURCES

The California Public Resources Code Chapter 1.7, Section 5097.5 makes it a misdemeanor for anyone to knowingly disturb an archaeological historical feature. California Public Resources Code Sections 5097.98 and 5097.99 require protection of Native American remains which may be found and outlines procedures for handling any burials found.

The California Administrative Code, Title 14, Section 4308, requires that no person disfigure any object of historical interest or value. The California Penal Code, Title 14, Part 1, Section 622-1/2 makes it a misdemeanor to destroy anything of historical value within any public place.

Should human skeletal material or archaeological remains be found during construction activities, all work must be halted within thirty (30) meters of the find. The Contractor shall notify the Engineer immediately. Construction activities within thirty (30) meters of the find shall remain halted until the Contractor has been notified that construction in the vicinity of the find may resume. If, in the opinion of the Engineer, the Contractor's operations are delayed or interfered with due to investigations made of the archaeological find, the State will compensate the Contractor for such delays to the extent provided in Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

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

5-1.26 HAZARDOUS AND RESTRICTED MATERIAL

GENERAL

Attention is directed to "Earthwork" of these special provisions regarding the removal and disposal of hazardous and restricted material.

Attention is directed to "Material Containing Arsenic" elsewhere in these special provisions.

Hazardous and Restricted (Type R) material has been discovered through testing within the project limits and identified on the plans as roadway excavation (type R) (hazardous and restricted material). Testing consisted of collecting and analyzing in situ samples from within the limits of excavation shown on the plans. A description of the sampling plan and summary tables of the test results are included in the “Materials Information Handout.” The complete report entitled “Allen Ranch EPA clean up site investigation, Highway 49, Amador County, PM R7.0 to R10.0 “ is available for inspection at the Department of Transportation, Duty Senior’s Desk, District 10. Requests to review the reports must be made with the Duty Senior at least one working day in advance. These test results have been used for disposal characterization of material within the project limits and shall not be construed as identifying all locations within the project limits that contain contaminants. The contractor shall notify the San Joaquin Air Quality Management District as required by NESHAP, 40CFR Part 61, and California Air Resources Control Board rules. A copy of the notification form and attachments shall be provided to the Engineer prior to submittal to the Air District. Notification shall take place a minimum of ten days prior to excavation.

Within the context of this contract, the designation “hazardous” shall apply to material with contaminant levels that meet or exceed the contaminant levels specified in the California Code of Regulations (CCR) Title 22. The designation “restricted” shall apply to material with either contaminant levels below the levels specified in the California Code of Regulations CCR Title 22 but with detectable contaminant levels that meet or exceed the contaminant levels specified in United States Environmental Protection Agency, Region 9, 2000 Preliminary Remediation Goals or California Environmental Protection Agency's Preliminary Remediation Goals. The levels of material designated as hazardous are not regulated under the Resource Conservation and Recovery Act (RCRA). The levels of Arsenic contamination in the material will restrict disposal and shall be considered to be designated waste as defined by Chapter 15, Title 23 of the State of California Code of Regulations.

Wherever the following terms are used in the contract documents, the meaning and intent shall be interpreted as provided below:

A. Hazardous material – Material that contains contaminants at concentrations equal to or greater than the threshold limit concentrations listed in Section 66261.24 of Title 22 of the California Code of Regulations, excluding Section 66261.24 (a) (1).
B. Restricted material – Material that does not contain contaminants at concentrations equal to or greater than the threshold limit concentrations listed in Section 66261.24 of Title 22 of the California Code of Regulations.

All hazardous and restricted materials found upon exterior surfaces of transport vehicles shall be removed and placed either into the excavation area prior to the vehicle leaving the exclusion zone. No hazardous material-shall be deposited on public roads. The Contractor shall indemnify the State from any costs due to spillage.

The Contractor shall monitor the air quality continuously during excavation operations at all locations containing hazardous material.

Characterization and disposal of additional material resulting from excavations performed outside of the pay limits shown on the plans, specified in the Standard Specifications, or specified in these special provisions or directed by the Engineer, for the Contractor’s convenience, shall be at the Contractor’s expense. This resultant material shall be presumed to be either restricted material or hazardous material if the test results for the location indicate that the material being excavated is restricted material or hazardous material. The Contractor shall dispose of the resultant material in conformance with the provisions in “Earthwork” of these special provisions. When the material must be removed from highway right of way, the

Contractor shall furnish replacement material suitable for the purpose intended in conformance with the provisions in Section 19, "Earthwork," of the Standard Specifications.

APPLICABLE RULES AND REGULATIONS

Excavation, and disposal of hazardous and restricted material shall be in accordance with the rules and regulations of the following agencies:

United States Department of Transportation (USDOT)
United States Environmental Protection Agency (USEPA)
California Environmental Protection Agency (CAL-EPA)

1. Department of Toxic Substance Control (DTSC)
2. Integrated Waste Management Board
3. Regional Water Quality Control Board, Region 5 (RWQCB)
4. State Air Resources Board

San Joaquin Valley Regional Air Quality Management District (SJVRAQMD)
California Division of Occupational Safety and Health Administration (CAL-OSHA)

PERMITS AND LICENSES

The Contractor shall procure all permits and licenses, pay all charges and fees, and give all notices necessary and incident to the due and lawful prosecution of the work, including registration for transporting vehicles carrying the hazardous material and the restricted material, in conformance with the provisions in Section 7-1.04, "Permits and Licenses," of the Standard Specifications.

The Engineer will obtain the Environmental Protection Agency Generator Identification Number as the State is the Generator.

SAMPLING AND ANALYSIS

The Contractor shall submit, for approval by the Engineer, a Sampling and Analysis Plan that describes the scope of the investigation, along with the name, address, and the California Department of Health Environmental Laboratory Program (ELAP) certification number of the testing laboratory, 15 working days prior to beginning any sampling or analysis for additional disposal facility requirements, reclassification of material, or characterization of material outside of the excavation pay limits. The Sampling and Analysis Plan shall be prepared under the guidance of a registered professional experienced in site characterization. The Engineer will make the final decision on reclassification or characterization of material after review of the test data. Five working days shall be allowed for review of test data. In the event the Engineer fails to complete the review within the time allowed, and if, in the opinion of the Engineer, completion of the work is delayed or interfered with by reason of the Engineer's delay in completing the review, the Contractor will be compensated for any resulting loss, and an extension of time will be granted, in the same manner as provided for in Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

The Contractor shall test the material to be excavated at his own expense for any additional acceptance requirements put forth by a disposal facility. Sampling and analysis shall be performed using the sampling and analysis procedure required by the disposal facility.

The Contractor may perform additional tests on the material to be excavated at his option and expense for confirmation of the material classification as hazardous or restricted. Sampling and analysis shall be the same or equivalent tests specified in the Materials Information Handout. The Contractor shall submit for approval by the Engineer, his sampling and analysis procedure and the name and address of the laboratory to be used fifteen (15) working days prior to beginning any sampling or analysis. The laboratory used shall be certified under the Environmental Laboratory Program (ELAP) by the California Department of Health Services. Analytical results shall be sent by facsimile or hand delivered to the Engineer as soon as they are available. A summary report of sampling protocols, chain of custody, analysis and laboratory data sheets shall be supplied to the Engineer within thirty days of completion of sampling.

The Contractor may perform additional tests on the material to be excavated for confirmation of the classification as restricted material or hazardous material. Sampling and analysis shall be based on guidelines in USEPA, SW 846, "Test Methods for Evaluating Solid Waste, Volume II: Field Manual Physical/Chemical Methods."

Operations shall be conducted in a manner that prevents increases in the quantities of hazardous material resulting from mixing with material containing lower contaminant concentrations. No additional compensation will be made for material requiring reclassification due to failure to segregate the material after excavation.

MEASUREMENT AND PAYMENT

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

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 United States Standard Measures 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 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. The plans and working drawings shall be submitted at least 7 days before the Contractor intends to begin the work involved.

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	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	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[1] SHOWN ON THE PLANS	BAR DESIGNATION NUMBER[2] TO BE SUBSTITUTED
10	3
13	4
16	5
19	6
22	7
25	8
29	9
32	10
36	11
43	14
57	18

[1]Bar designation numbers approximate the number of millimeters of the nominal diameter of the bars.
[2]Bar numbers are based on the number of eighths of an inch included in the nominal diameter of the bars.
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.

SUBSTITUTION 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	SIZE TO BE SUBSTITUTED 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

SUBSTITUTION 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 mm	GAGE TO BE SUBSTITUTED inch	METRIC THICKNESS SHOWN ON THE PLANS mm	GAGE TO BE SUBSTITUTED 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	--------	--------

SUBSTITUTION TABLE FOR WIRE

METRIC THICKNESS SHOWN ON THE PLANS mm	WIRE THICKNESS TO BE SUBSTITUTED 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

SUBSTITUTION TABLE FOR PIPE PILES

METRIC SIZE SHOWN ON THE PLANS mm x mm	SIZE TO BE SUBSTITUTED 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 millimeters (T) represents an exact conversion of the thickness in inches (T").

SUBSTITUTION 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	NOMINAL SIZE TO BE SUBSTITUTED 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

SUBSTITUTION 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	SIZE TO BE SUBSTITUTED 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

SUBSTITUTION 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	NOMINAL SIZE TO BE SUBSTITUTED 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

Unless otherwise specified, substitutions of United States Standard Measures standard structural shapes corresponding to the metric designations shown on the plans and in conformance with the requirements in ASTM Designation: A 6/A 6M, Annex 2, will be allowed.

8-1.02 PREQUALIFIED AND TESTED SIGNING AND DELINEATION MATERIALS

The Department maintains the following list of Prequalified and Tested Signing and Delineation Materials. The Engineer shall not be precluded from sampling and testing products on the list of Prequalified and Tested Signing and Delineation Materials.

The manufacturer of products on the list of Prequalified and Tested Signing and Delineation Materials 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.

For those categories of materials included on the list of Prequalified and Tested Signing and Delineation Materials, only those products shown within the listing may be used in the work. Other categories of products, not included on the list of Prequalified and Tested Signing and Delineation Materials, may be used in the work provided they conform to the requirements of the Standard Specifications.

Materials and products may be added to the list of Prequalified and Tested Signing and Delineation Materials 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 With Abrasion Resistant Surface (ARS)

A. Apex, Model 921AR (100 mm x 100 mm)
B. Avery Dennison (formerly Stimsonite), Models C88 (100 mm x 100 mm), 911 (100 mm x 100 mm) and 953 (70 mm x 114 mm)
C. Ray-O-Lite, Model "AA" ARS (100 mm x 100 mm)
D. 3M Series 290 (89 mm x 100 mm)
E. 3M Series 290 PSA, with pressure sensitive adhesive pad (89 mm x 100 mm)

Retroreflective With Abrasion Resistant Surface (ARS)

(for recessed applications only)

A. Avery Dennison (formerly Stimsonite), Model 948 (58 mm x 119 mm)
B. Avery Dennison (formerly Stimsonite), Model 944SB (51 mm x 100 mm)*
C. Ray-O-Lite, Model 2002 (58 mm x 117 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, 100 mm Round

A. Alpine Products, "D-Dot" and "ANR" (ABS)
B. Apex Universal (Ceramic)
C. Apex Universal, Models 929 (ABS) and 929PP (Polypropylene)
D. Elgin Molded Plastics, "Empco-Lite" Model 900 (ABS)
E. Hi-Way Safety, Inc., Models P20-2000W and 2001Y (ABS)
F. Interstate Sales, "Diamond Back" (ABS) and (Polypropylene)
G. Novabrite Models Cdot (White) Cdot-y (Yellow), Ceramic
H. Novabrite Models Adot-w (White) Adot-y (Yellow), (ABS)
I. Novabrite Models Pdot-w (White) Pdot-y (Yellow), Polypropylene
J. Road Creations, Model RCB4NR (Acrylic)
K. Three D Traffic Works TD10000 (ABS), TD10500 (Polypropylene)
L. Zumar Industries, "Titan TM40A" (ABS)

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. Elgin Molded Plastics, "Empco-Lite" Model 901 (100 mm x 100 mm)
C. Road Creations, Model R41C (100 mm x 100 mm)
D. 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. Bunzl Extrusion, Models T.O.M., T.R.P.M., and "HH" (High Heat)
C. Hi-Way Safety, Inc., Model 1280/1281

STRIPING AND PAVEMENT MARKING MATERIAL

Permanent Traffic Striping and Pavement Marking Tape

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

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

A. Advanced Traffic Marking, Series 200
B. Brite-Line, Series 100
C. Garlock Rubber Technologies, Series 2000
D. P.B. Laminations, Aztec, Grade 102
E. Swarco Industries, "Director-2"
F. Trelleborg Industri, R140 Series
G. 3M, Series 620 "CR", and Series A750
H. 3M, Series A145, Removable Black Line Mask
(Black Tape: for use only on Asphalt Concrete Surfaces)
I. Advanced Traffic Marking Black "Hide-A-Line"
(Black Tape: for use only on Asphalt Concrete Surfaces)
J. Brite-Line "BTR" Black Removable Tape
(Black Tape: for use only on Asphalt Concrete Surfaces)
K. Trelleborg Industri, RB-140
(Black Tape: for use only on Asphalt Concrete Surfaces)

Preformed Thermoplastic (Heated in place)

A. Avery Dennison, "Hotape"
B. Flint Trading, "Premark," "Premark 20/20 Flex," and "Premark 20/20 Flex Plus"

Ceramic Surfacing Laminate, 150 mm x 150 mm

A. Safeline Industries/Highway Ceramics, Inc.

CLASS 1 DELINEATORS

One Piece Driveable Flexible Type, 1700 mm

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

Special Use Type, 1700 mm

A. Bunzl Extrusion, Model FG 560 (with 450 mm U-Channel base)
B. Carsonite, "Survivor" (with 450 mm U-Channel base)
C. Carsonite, Roadmarker CRM-375 (with 450 mm U-Channel base)
D. FlexStake, Model 604
E. GreenLine Models HWDU and CGD (with 450 mm U-Channel base)
F. Impact Recovery Model D36, with #105 Driveable Base
G. Safe-Hit with 200 mm pavement anchor (SH248-GP1)
H. Safe-Hit with 380 mm soil anchor (SH248-GP2) and with 450 mm soil anchor (SH248-GP3)

Surface Mount Type, 1200 mm

A. Bent Manufacturing Company, Masterflex Model MF-180EX-48
B. Carsonite, "Super Duck II"
C. FlexStake, Surface Mount, Models 704 and 754 TM
D. Impact Recovery Model D48, with #101 Fixed (Surface-Mount) Base
E. Three D Traffic Works "Channelflex" Part No. 522248W

CHANNELIZERS

Surface Mount Type, 900 mm

A. Bent Manufacturing Company, Masterflex Models MF-360-36 (Round) and MF-180-36 (Flat)
B. Bunzl Extrusion, Flexi-Guide Models FG300LD and FG300UR
C. Carsonite, "Super Duck" (Flat SDF-436, Round SDR-336)

D. Carsonite, "Super Duck II" Model SDCF203601MB "The Channelizer"
E. FlexStake, Surface Mount, Models 703 and 753 TM
F. GreenLine, Model SMD-36
G. Hi-Way Safety, Inc. "Channel Guide Channelizer" Model CGC36
H. Impact Recovery Model D36, with #101 Fixed (Surface-Mount) Base
I. Repo, Models 300 and 400
J. Safe-Hit, Guide Post, Model SH236SMA
K. The Line Connection, "Dura-Post" Model DP36-3 (Permanent)
L. The Line Connection, "Dura-Post" Model DP36-3C (Temporary)
M. Three D Traffic Works "Channelflex" Part No. 522053W

Lane Separation System

A. Bunzl "Flexi-Guide (FG) 300 Curb System"
B. Qwick Kurb, "Klemmfix Guide System"
C. Recycled Technology, Inc. "Safe-Lane System"

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. Radiator Specialty Company "Enforcer"
D. Roadmaker Company "Stacker"
E. TrafFix Devices "Grabber"

OBJECT MARKERS
Type "K", 450 mm

A. Bunzl, Model FG318PE
B. Carsonite, Model SMD 615
C. FlexStake, Model 701 KM
D. Repo, Models 300 and 400
E. Safe-Hit, Model SH718SMA
F. The Line Connection, Model DP21-4K

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

A. Bent Manufacturing "Masterflex" Model MF-360-24
B. Bunzl Extrusion, Model FG324PE
C. Carsonite, Super Duck II
D. FlexStake, Model 701KM
E. Repo, Models 300 and 400
F. Safe-Hit, Models SH8 24SMA_WA and SH8 24GP3_WA
G. The Line Connection, Model DP21-4Q
H. Three D Traffic Works "Q" Marker, Part No. 531702W

CONCRETE BARRIER MARKERS AND
TEMPORARY RAILING (TYPE K) REFLECTORS
Impactable Type

A. ARTUK, "FB"
B. Bunzl Extrusion, Models PCBM-12 and PCBM-T12
C. Duraflex Corp., "Flexx 2020" and "Electriflexx"
D. Hi-Way Safety, Inc., Model GMKRM100
E. Plastic Safety Systems "BAM" Models OM-BARR and OM-BWAR
F. Sun-Lab Technology, "Safety Guide Light Model TM-5"
G. Three D Traffic Works "Roadguide" TD9000 Series

Non-Impactable Type

A. ARTUK, JD Series
B. Plastic Safety Systems "BAM" Models OM-BITARW and OM-BITARA
C. Vega Molded Products, Models GBM and JD

THRIE BEAM BARRIER MARKERS
(For use to the left of traffic)
A. Bunzl Extrusion, "Mini" (75 mm x 254 mm)
B. Duraflex Corp., "Railrider"

CONCRETE BARRIER DELINEATORS, 400 mm
(For use to the right of traffic)
A. Bunzl Extrusion, Model PCBM T-16
B. Safe-Hit, Model SH216RBM
C. Sun-Lab Technology, "Safety Guide Light, Model TM16," (75 mm x 300 mm)
D. Three D Traffic Works "Roadguide" TD9416 Series

CONCRETE BARRIER-MOUNTED MINI-DRUM (260 mm x 360 mm x 570 mm)
A. Stinson Equipment Company "SaddleMarker"

SOUND WALL DELINEATOR
(Applied vertically. Place top of 75 mm x 300 mm reflective element at 1200 mm above roadway)
A. Bunzl Extrusion, PCBM S-36
B. Sun-Lab Technology, "Safety Guide Light, Model SM12," (75 mm x 300 mm)

GUARD RAILING DELINEATOR
(Place top of reflective element at 1200 mm above plane of roadway)

Wood Post Type, 686 mm

A. Bunzl Extrusion, FG 427 and FG 527
B. Carsonite, Model 427
C. FlexStake, Model 102 GR
D. GreenLine GRD 27
E. J. Miller Model JMI-375G
F. Safe-Hit, Model SH227GRD
G. Three D Traffic Works "Guardflex" TD5100 Series

Steel Post Type

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

RETROREFLECTIVE SHEETING

Channelizers, Barrier Markers, and Delineators

A. Avery Dennison T-6500 Series (Formerly Stimsonite, Series 6200) (For rigid substrate devices only)
B. Avery Dennison WR-6100 Series
C. Nippon Carbide, Flexible Ultralite Grade (ULG) II
D. Reflexite, PC-1000 Metalized Polycarbonate
E. Reflexite, AC-1000 Acrylic
F. Reflexite, AP-1000 Metalized Polyester
G. Reflexite, Conformalight, AR-1000 Abrasion Resistant Coating
H. 3M, High Intensity

Traffic Cones, 330 mm Sleeves

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

Traffic Cones, 100 mm and 150 mm Sleeves

A. Nippon Carbide, Flexible Ultralite Grade (ULG) II
B. Reflexite, Vinyl, "TR" (Semi-transparent) or "Conformalight"
C. 3M Series 3840

Barrels and Drums

A. Avery Dennison WR-6100
B. Nippon Carbide, Flexible Ultralite Grade (ULG) II
C. Reflexite, “Conformalight”, "Super High Intensity" or "High Impact Drum Sheeting"
D. 3M Series 3810

Barricades: Type I, Medium-Intensity (Typically Enclosed Lens, Glass-Bead Element)

A. American Decal, Adcolite
B. Avery Dennison, T-1500 and T-1600 series
C. 3M Engineer Grade, Series 3170

Barricades: Type II, Medium-High-Intensity (Typically Enclosed Lens, Glass-Bead Element)

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

Signs: Type II, Medium-High-Intensity (Typically Enclosed Lens, Glass-Bead Element)

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

Signs: Type III, High-Intensity (Typically Encapsulated Glass-Bead Element)

A. Avery Dennison, T-5500 Series
B. Nippon Carbide, Nikkalite Brand Ultralite Grade II
C. 3M Series 3870

Signs: Type IV, High-Intensity (Typically Unmetallized Microprismatic Element)

A. Avery Dennison, T-6500 Series (Formerly Stimsonite Series 6200)
B. Nippon Carbide, Crystal Grade, 94000 Series

Signs: Type VI, Elastomeric (Roll-Up) High-Intensity, without Adhesive

A. Avery Dennison, WU-6014 (Fluorescent orange)
B. Novabrite LLC, "Econobrite"
C. Reflexite "Vinyl" (Orange)
D. Reflexite "SuperBright" (Fluorescent orange)
E. Reflexite "Marathon" (Fluorescent orange)
F. 3M Series RS34 (Orange) and RS20 (Fluorescent orange)

Signs: Type VII, Super-High-Intensity (Typically Unmetallized Microprismatic Element)

A. 3M LDP Series 3970

Signs: Type VIII, Super-High-Intensity (Typically Unmetallized Microprismatic Element)

A. Avery Dennison, T-7500 Series

Signs: Type IX, Very-High-Intensity (Typically Unmetallized Microprismatic Element)

A. 3M VIP Series 3990 Diamond Grade

SPECIALTY SIGNS

A. All Sign Products, STOP Sign (All Plastic), 750 mm
B. Relexite "Endurance" Work Zone Sign (with Semi-Rigid Plastic Substrate)

SIGN SUBSTRATE

Fiberglass Reinforced Plastic (FRP)

A. Fiber-Brite
B. Sequentia, "Polyplate"
C. Inteplast Group "InteCel" (13 mm for Post-Mounted CZ Signs, 1200 mm or less)

Aluminum Composite

A. Alcan Composites "Dibond Material, 2 mm"
B. Mitsubishi Chemical America, Alpolic 350

8-1.03 STATE-FURNISHED MATERIALS

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

The following materials will be furnished to the Contractor:

A. Sign panels for roadside signs and mast arm mounted signs.
B. Padlocks for walk gates.
C. Light Emitting Diode Signal and Pedestrian Modules for vehicular traffic signal units and Type A pedestrian signals.
D. Model 170 controller assembly, including controller unit, completely wired controller cabinet, and inductive loop detector sensor units.

Completely wired controller cabinets, with auxiliary equipment but without controller unit, will be furnished to the Contractor at Caltrans Maintenance Yard, 1604 South B Street, Stockton, CA 95026.

8-1.04 ENGINEERING FABRICS

Engineering fabrics shall conform to the provisions in Section 88, "Engineering Fabrics," of the Standard Specifications and these special provisions.

Filter fabric for this project shall be ultraviolet (UV) ray protected.

SECTION 8-2. CONCRETE

8-2.01 PORTLAND CEMENT CONCRETE

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

References to Section 90-2.01, "Portland Cement," of the Standard Specifications shall mean Section 90-2.01, "Cement," of the Standard Specifications.

Mineral admixture shall be combined with cement in conformance with the provisions in Section 90-4.08, "Required Use of Mineral Admixtures," of the Standard Specifications for the concrete materials specified in Section 56-2, "Roadside Signs," of the Standard Specifications.

The requirements of Section 90-4.08, "Required Use of Mineral Admixture," of the Standard Specifications shall not apply to Section 19-3.025C, "Soil Cement Bedding," of the Standard Specifications.

The Department maintains a list of sources of fine and coarse aggregate that have been approved for use with a reduced amount of mineral admixture in the total amount of cementitious material to be used. A source of aggregate will be considered for addition to the approved list if the producer of the aggregate submits to the Transportation Laboratory certified test results from a qualified testing laboratory that verify the aggregate complies with the requirements. Prior to starting the testing, the aggregate test shall be registered with the Department. A registration number can be obtained by calling (916) 227-7228. The registration number shall be used as the identification for the aggregate sample in correspondence with the Department. Upon request, a split of the tested sample shall be provided to the Department. Approval of aggregate will depend upon compliance with the specifications, based on the certified test results submitted, together with any replicate testing the Department may elect to perform. Approval will expire 3 years from the date the most recent registered and evaluated sample was collected from the aggregate source.

Qualified testing laboratories shall conform to the following requirements:

A. Laboratories performing ASTM Designation: C 1293 shall participate in the Cement and Concrete Reference Laboratory (CCRL) Concrete Proficiency Sample Program and shall have received a score of 3 or better on all tests of the previous 2 sets of concrete samples.
B. Laboratories performing ASTM Designation: C 1260 shall participate in the Cement and Concrete Reference Laboratory (CCRL) Pozzolan Proficiency Sample Program and shall have received a score of 3 or better on the shrinkage and soundness tests of the previous 2 sets of pozzolan samples.

Aggregates on the list shall conform to one of the following requirements:

A. When the aggregate is tested in conformance with the requirements in California Test 554 and ASTM Designation: C 1293, the average expansion at one year shall be less than or equal to 0.040 percent; or
B. When the aggregate is tested in conformance with the requirements in California Test 554 and ASTM Designation: C 1260, the average of the expansion at 16 days shall be less than or equal to 0.15 percent.

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

A. The minimum amount of cement shall not be less than 75 percent by mass of the specified minimum cementitious material content.
B. The minimum amount of mineral admixture to be combined with cement shall be determined using one of the following criteria:

    1. When the calcium oxide content of a mineral admixture is equal to or less than 2 percent by mass, the amount of mineral admixture shall not be less than 15 percent by mass of the total amount of cementitious material to be used in the mix.
    2. When the calcium oxide content of a mineral admixture is greater than 2 percent by mass, and any of the aggregates used are not listed on the approved list as specified in these special provisions, then the amount of mineral admixture shall not be less than 25 percent by mass of the total amount of cementitious material to be used in the mix.
    3. When the calcium oxide content of a mineral admixture is greater than 2 percent by mass and the fine and coarse aggregates are listed on the approved list as specified in these special provisions, then the amount of mineral admixture shall not be less than 15 percent by mass of the total amount of cementitious material to be used in the mix.
    4. When a mineral admixture that conforms to the provisions for silica fume in Section 90-2.04, "Admixture Materials," of the Standard Specifications is used, the amount of mineral admixture shall not be less than 10 percent by mass of the total amount of cementitious material to be used in the mix.
    5. When a mineral admixture that conforms to the provisions for silica fume in Section 90-2.04, "Admixture Materials," of the Standard Specifications is used and the fine and coarse aggregates are listed on the approved list as specified in these special provisions, then the amount of mineral admixture shall not be less than 7 percent by mass of the total amount of cementitious material to be used in the mix.

C. The total amount of mineral admixture shall not exceed 35 percent by mass of the total amount of cementitious material to be used in the mix. Where Section 90-1.01, "Description," of the Standard Specifications specifies a maximum cementitious content in kilograms per cubic meter, the total mass of cement and mineral admixture per cubic meter shall not exceed the specified maximum cementitious material content.

Unless otherwise specified, mineral admixture will not be required in portland cement concrete used for precast concrete girders.

The Contractor will be permitted to use Type III portland cement for concrete used in the manufacture of precast concrete members.

8-2.02 FREEZE-THAW REQUIREMENTS

Aggregates proposed for use in portland cement concrete and precast portland cement concrete products shall pass the freezing and thawing test specified in Section 90-2.02, "Aggregates," of the Standard Specifications and these special provisions.

Attention is directed to the fact that California Test 528, "Test for Freeze-Thaw Resistance of Aggregates in Air-Entrained Concrete," does not include procedures that determine compliance of the aggregates with the other requirements of the plans and specifications.

The mortar strength of fine aggregate relative to the mortar strength of Ottawa sand shall be 100 percent, minimum, as determined by California Test 515.

Unless a higher cement content is otherwise required, the minimum cement content for all portland cement concrete and for all precast portland cement concrete products shall be 350 kilograms per cubic meter.

An air-entraining admixture conforming to the provisions in Section 90-4, "Admixtures," of the Standard Specifications shall be added to the concrete at the rate required to result in an air content of 6 ± 1.5 percent in the freshly mixed concrete, unless a different air content is specified in these special provisions.

SECTION 8-3. WELDING

8-3.01 WELDING

GENERAL

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

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

AWS Code	Year of Adoption
D1.1	2000
D1.4	1998
D1.5	1995
D1.5 (metric only)	1996

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

Sections 6.1.2 through 6.1.4.3 of AWS D 1.1, Sections 7.1.1 and 7.1.2 of AWS D 1.4, and Sections 6.1.1.1 through 6.1.3.3 of AWS D 1.5 are replaced with the following:

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

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

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

The QC Inspector shall be responsible for quality control acceptance or rejection of materials and workmanship, and shall be currently certified as an AWS Certified Welding Inspector (CWI) in conformance with the requirements in AWS QC1, "Standard and Guide for Qualification of Welding Inspectors."

The QC Inspector may be assisted by an Assistant QC Inspector provided that this individual is currently certified as an AWS Certified Associate Welding Inspector (CAWI) in conformance with the requirements in AWS QC1, "Standard and Guide for Qualification of Welding Inspectors," or has equivalent qualifications. The QC Inspector shall monitor the Assistant QC Inspector's work, and shall be responsible for signing all reports.

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

Section 6.14.6, "Personnel Qualification," of AWS D 1.1, Section 7.7.6, "Personnel Qualification," of AWS D 1.4, and Section 6.1.3.4, "Personnel Qualification," of AWS D 1.5 are replaced with the following:

Personnel performing nondestructive testing (NDT) shall be qualified and certified in conformance with the requirements of the American Society for Nondestructive Testing (ASNT) Recommended Practice No. SNT-TC-1A and the Written Practice of the NDT firm. The Written Practice of the NDT firm shall meet or exceed the guidelines of the ASNT Recommended Practice No. SNT-TC-1A. Only individuals who are 1) certified as an NDT Level II, or 2) Level III

technicians who hold a current ASNT Level III certificate in that discipline and are authorized and certified to perform the work of Level II technicians, shall perform NDT, review the results, and prepare the written reports.

Section 6.5.4, "Scope of Examination," of AWS D 1.1 and Section 7.5.4 of AWS D 1.4 are replaced with the following:

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

Section 6.5.4 of AWS D 1.5 is replaced with the following:

The QC Inspector shall inspect and approve each joint preparation, assembly practice, welding technique, and the performance of each welder, welding operator, and tack welder to make certain that the applicable requirements of this code and the approved WPS are met. The QC Inspector shall examine the work to make certain that it meets the requirements of Sections 3 and 9.21. The size and contour of all welds shall be measured using suitable gages. Visual inspection for cracks in welds and base metal, and for other discontinuities should be aided by strong light magnifiers, or such other devices as may be helpful. Acceptance criteria different from those specified in this code may be used when approved by the Engineer.

Section 6.6.5, "Nonspecified Nondestructive Testing Other Than Visual," of AWS D 1.1, Section 6.6.5 of AWS D 1.4 and Section 6.6.5 of AWS D 1.5 shall not apply.

For any welding, the Engineer may direct the Contractor to perform NDT that is in addition to the visual inspection or NDT specified in the AWS welding codes, in the Standard Specifications, or in these special provisions. Additional NDT required by the Engineer, will be paid for as extra work as provided in Section 4-1.03D, "Extra Work," of the Standard Specifications. Should any welding deficiencies be discovered by this additional NDT, the cost of the testing will not be paid for as extra work but shall be at the Contractor's expense.

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

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

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

Inspection and approval of all joint preparations, assembly practices, welding techniques, and the performance of each welder, welding operator, and tack welder shall be documented by the QC Inspector on a daily basis for each day that welding is performed. The QC Inspector shall confirm and document compliance with the requirements of the AWS code criteria and the requirements of these special provisions on all weld joints before welding, during welding, and after the completion of each weld.

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

The period of effectiveness for a welder's or welding operator's qualification shall be a maximum of 3 years for the same weld process, welding position, and weld type. A valid qualification at the beginning of work on a contract will be acceptable for the entire period of the contract, as long as the welder's work remains satisfactory.

WELDING QUALITY CONTROL

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

Unless otherwise specified, welding quality control shall apply when any work is welded in conformance with the provisions in Section 49, "Piling," Section 52, "Reinforcement," Section 55, "Steel Structures," Section 56-1, "Overhead Sign Structures," Section 75-1.035, "Bridge Joint Restrainer Units," or Section 86-2.04, "Standards, Steel Pedestals and Posts," of the Standard Specifications.

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

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

The QCM shall be the sole individual responsible to the Contractor for submitting, receiving, and approving all correspondence, required submittals, and reports to and from the Engineer.

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

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

A. The welding is performed at a permanent fabrication or manufacturing facility which is certified under the AISC Quality Certification Program, Category Cbr, Major Steel Bridges.
B. The welding is performed at a permanent fabrication or manufacturing facility which is certified under the AISC Quality Certification Program, Category Sbd, Conventional Steel Building Structures. This condition shall apply only for work welded in conformance with the provisions in Section 56-1, "Overhead Sign Structures" or Section 86-2.04, "Standards, Steel Pedestals and Posts," of the Standard Specifications.
C. The welding is performed on pipe pile material at a permanent pipe manufacturing facility where an automatic welding process or seamless pipe operation is used in conformance with the requirements in the applicable welding code as specified elsewhere in these special provisions.

For welding performed at such facilities, the inspection personnel or NDT firms may be employed or compensated by the facility performing the welding.

Prior to submitting the Welding Quality Control Plan (WQCP) required herein, a pre-welding meeting between the Engineer, Contractor, and any entity performing welding for this project, shall be held to discuss the requirements for the WQCP.

The Contractor shall submit to the Engineer, in conformance with the provisions in Section 5-1.02, "Plans and Working Drawings," of the Standard Specifications, 3 copies of a separate WQCP for each item of work for which welding is to be performed.

The Contractor shall allow the Engineer 2 weeks to review the WQCP submittal after a complete plan has been received. Except for work that is welded in conformance with Section 86-2.04, "Standards, Steel Pedestals and Posts," of the Standard Specifications, and for pipe piling produced at a permanent manufacturing facility as specified above, no welding shall be performed until the WQCP is approved in writing by the Engineer. Materials welded in conformance with Section 86-2.04, "Standards, Steel Pedestals and Posts," of the Standard Specifications, and pipe piling produced at such permanent manufacturing facilities, shall not be incorporated into the work until the WQCP is approved in writing by the Engineer. In the event the Engineer fails to complete the review within the time allowed, and if, in the opinion of the Engineer, completion of the work is delayed or interfered with by reason of the Engineer's delay in completing the review, the Contractor will be compensated for any resulting loss, and an extension of time will be granted, in the same manner as provided for in Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

An amended WQCP or any addendum to the approved WQCP shall be submitted to, and approved in writing by the Engineer, for proposed revisions to the approved WQCP. An amended WQCP or addendum will be required for revisions to the WQCP, including but not limited to a revised WPS, additional welders, changes in NDT firms or procedures, QC, or NDT personnel, or updated systems for tracking and identifying welds. The Engineer shall have 3 working days to complete the review of the amended WQCP or addendum. Work affected by the proposed revisions shall not be performed until the amended WQCP or addendum has been approved. In the event the Engineer fails to complete the review within the time allowed, and if, in the opinion of the Engineer, completion of the work is delayed or interfered with by reason of the Engineer's delay in completing the review, the Contractor will be compensated for any resulting loss, and an extension of time will be granted, in the same manner as provided for in Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

Each WQCP shall include the applicable portions of the following, as determined by the Engineer:

A. The name of the welding firm and any required NDT inspection personnel or firms.
B. A manual prepared by the NDT inspection personnel or firm that shall include equipment, testing procedures, code of safe practices, the Written Practice of the NDT inspection personnel or firm, and the names, qualifications, and documentation of certifications for all personnel to be used.

C. The name of the QCM and the names, qualifications, and documentation of certifications for all QC Inspectors and Assistant QC Inspectors to be used.
D. An organizational chart showing all QC personnel and their assigned QC responsibilities.
E. The methods and frequencies for performing all required quality control procedures, including QC inspection forms to be used, as required by the specifications including:

    1. all visual inspections.
    2. all NDT including radiographic geometry, penetrameter and shim selection, film quality, film processing, radiograph identification and marking system, and film interpretation and reports.
    3. calibration procedures and calibration frequency for all NDT equipment.

F. A system for the identification and tracking of all welds, NDT, and any required repairs, and a procedure for the reinspection of repaired welds. The system shall have provisions for 1) permanently identifying each weld and the person who performed the weld, 2) placing all identification and tracking information on each radiograph, 3) a method of reporting nonconforming welds to the Engineer, and 4) a method of documentation of repairs and reinspection of nonconforming welds.
G. Standard procedures for performing noncritical repair welds. Noncritical repair welds are defined as welds to deposit additional weld beads or layers to compensate for insufficient weld size and to fill limited excavations that were performed to remove unacceptable edge or surface discontinuities, rollover or undercut. The depth of these excavations shall not exceed 65 percent of the specified weld size.
H. The WPS, including documentation of all supporting Procedure Qualification Record (PQR) tests performed, and the name of the testing laboratory who performed the tests, to verify the acceptability of the WPS. The submitted WPS shall be within the allowable period of effectiveness.
I. Documentation of all certifications for welders for each weld process and position that will be used. Certifications shall list the electrodes used, test position, base metal and thickness, tests performed, and the witnessing authority. All certifications shall be within the allowable period of effectiveness.
J. One authorized copy or original code book for each of all AWS welding codes and the FCP which are applicable to the welding to be performed. These codes and the FCP shall become the permanent property of the Department.
K. Forms to be used for Certificates of Compliance, daily production logs, and daily reports.

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

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

A daily production log for welding shall be kept by the QCM for each day that welding is performed. The log shall clearly indicate the locations of all welding, except partial penetration longitudinal seam welds performed in conformance with Section 86-2.04, "Standards, Steel Pedestals and Posts," of the Standard Specifications. The log shall include the welders' names, amount of welding performed, any problems or deficiencies discovered, and any testing or repair work performed, at each location. The daily report from each QC Inspector shall also be included in the log.

The following items shall be included in a Welding Report that is to be submitted to the Engineer within 7 days following the performance of any welding. For work welded in conformance with Section 86-2.04, "Standards, Steel Pedestals and Posts," of the Standard Specifications, and for piling produced at a permanent manufacturing facility, the following items shall be included in a Welding Report that is to be submitted to the Engineer 48 hours prior to furnishing a Certificate of Compliance for the material:

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

Radiographic envelopes shall have clearly written on the outside of the envelope the following information: name of the QCM, name of the nondestructive testing firm, name of the radiographer, date, contract number, complete part description, and all included weld numbers or a report number, as detailed in the WQCP. In addition, all innerleaves shall have clearly written on them the part description and all included weld numbers, as detailed in the WQCP.

Reports regarding NDT, including radiographs, shall be signed by both the NDT technician and the person that performed the review, and then submitted directly to the QCM for review and signature prior to submittal to the Engineer. Corresponding names shall be clearly printed or typewritten next to all signatures.

The Engineer will review the Welding Report to determine if the Contractor is in conformance with the WQCP. Unless otherwise specified, the Engineer shall be allowed 7 working days to review the report and respond in writing after a complete Welding Report has been received. Prior to receiving notification from the Engineer of the Contractor's conformance with the WQCP, the Contractor may encase in concrete or cover welds for which a Welding Report has been submitted. However, should the Contractor elect to encase or cover those welds prior to receiving notification from the Engineer, it is expressly understood that the Contractor shall not be relieved of the responsibility for incorporating material in the work that conforms to the requirements of the plans and specifications. Material not conforming to these requirements will be subject to rejection. Should the Contractor elect to wait to encase or cover welds pending notification by the Engineer, and in the event the Engineer fails to complete the review within the time allowed, and if, in the opinion of the Engineer, completion of the work is delayed or interfered with by reason of the Engineer's delay in completing the review, the Contractor will be compensated for any resulting loss, and an extension of time will be granted, in the same manner as provided for in Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

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

Except for noncritical weld repairs, the Engineer shall be notified immediately in writing when welding problems, deficiencies, base metal repairs, or any other type of repairs not submitted in the WQCP are discovered and also of the proposed repair procedures to correct them. The Contractor shall allow the Engineer one week to review these procedures. No remedial work shall begin until the repair procedures are approved in writing by the Engineer. In the event the Engineer fails to complete the review within the time allowed, and if, in the opinion of the Engineer, completion of the work is delayed or interfered with by reason of the Engineer's delay in completing the review, the Contractor will be compensated for any resulting loss, and an extension of time will be granted, in the same manner as provided for in Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

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

PAYMENT

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

SECTION 9. DESCRIPTION OF BRIDGE WORK

Bridge work shall consist, in general, of constructing the following two cast-in-place prestressed box girder bridges with structure approach slabs, Type N, as shown on the plans:

SUTTER CREEK BRIDGE
(Bridge No. 26-0040)

AMADOR CREEK BRIDGE
(Bridge No. 26-0043)

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 CONSTRUCTION

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.

Full compensation for furnishing, erecting, maintaining, and removing and disposing of the construction project information signs shall be considered as included in the contract lump sum price paid for construction area signs and no additional compensation will be allowed therefor.

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 permanent right of way fencing and temporary environmental fence shall be in place prior to commencement of any earth disturbing activities.

Attention is directed to "Environmentally Sensitive Area" elsewhere in these special provisions.

Attention is directed to "Archaeological Monitoring" elsewhere in these special provisions.

Attention is directed to "Cultural Resources" elsewhere in these special provisions.

Attention is directed to "Hazardous and Restricted Materials" elsewhere in these special provisions.

No falsework supports or disturbance of vegetation will be allowed within the Environmentally Sensitive Areas (ESA) at Sutter Creek and Amador Creek.

The Contractor shall schedule the local streets operations so that once work has begun it shall be carried out expeditiously. No delay in construction longer than 20 consecutive working days will be allowed for each street, unless restricted by inclement weather.

The equipment undercrossing shall be constructed prior to any construction operations that would effect cattle ranching operations on Route 49 between Station 29+00 and Station 44+00.

The Contractor shall contact utility owners of abandoned underground facilities and present certification to the Engineer that the abandoned utility facilities are free of combustible/hazardous materials prior to excavation or removal of underground pipes.

Attention is directed to "Miscellaneous Concrete Construction" of these special provisions regarding constructing a 600 mm by 600 mm test panel prior to constructing curb ramps with detectable warning surfaces.

Attention is directed to "Fire Plan" of these special provisions regarding cooperating with local fire prevention authorities and implementing the fire plan established for this project.

Attention is directed to "Environmentally Sensitive Area" and "Temporary Environmental Fence" of these special provisions. Prior to beginning work, the boundaries of the Environmentally Sensitive Areas (ESA) shall be clearly delineated in the field. The boundaries shall be delineated by the installation of temporary environmental fence.

Attention is directed to "Water Pollution Control" of these special provisions regarding the submittal and approval of the Storm Water Pollution Prevention Plan prior to performing work having potential to cause water pollution.

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

The uppermost layer of new pavement shall not be placed until all underlying conduits and loop detectors have been installed.

Prior to commencement of the traffic signal functional test at any location, all items of work related to signal control shall be completed and all roadside signs, pavement delineation, and pavement markings shall be in place at that location.

Attention is directed to "Maintaining Traffic" and "Temporary Pavement Delineation" of these special provisions .

Attention is directed to "Progress Schedule (Critical Path Method)" of these special provisions regarding the submittal of a general time-scaled logic diagram within 10 days after approval of the contract. The diagram shall be submitted prior to performing any work that may be affected by any proposed deviations to the construction staging of the project.

At the end of each working day if a difference in excess of 0.046-meter exists between the elevation of the existing pavement and the elevation of excavations within 2.4-meters of the traveled way, material shall be placed and compacted against the vertical cuts adjacent to the traveled way. During excavation operations, native material may be used for this purpose; however, once placing of the structural section commences, structural material shall be used. The material shall be placed to the level of the elevation of the top of existing pavement and tapered at a slope of 1:4 (vertical:horizontal) or flatter to the bottom of the excavation. Treated base shall not be used for the taper. Full compensation for placing the material on a 1:4 slope, regardless of the number of times the material is required, and subsequent removing or reshaping of the material to the lines and grades shown on the plans shall be considered as included in the contract price paid for the materials involved and no additional compensation will be allowed therefor. No payment will be made for material placed in excess of that required for the structural section.

At those locations exposed to public traffic where guard railings are to be constructed, reconstructed, or removed and replaced, the Contractor shall schedule operations so that at the end of each working day there shall be no post holes open nor shall there be any railing or barrier posts installed without the blocks and rail elements assembled and mounted thereon.

Attention is directed to requirements of "Move-In/Move-Out (Erosion Control)" elsewhere in these special provisions.

Not less than 60 days prior to applying seeds, the Contractor shall furnish the Engineer a statement from the vendor that the order for the seed and straw required for this contract has been received and accepted by the vendor. The statement from the vendor shall include the names and quantity of seed ordered and the anticipated date of delivery.

When embankment settlement periods or surcharge embankment settlement periods are specified, the settlement periods and the deferment of portions of the work shall comply with the provisions in Section 19-6.025, "Settlement Period," of the Standard Specifications and in "Earthwork" of these special provisions.

10-1.02 SITE HEALTH AND SAFETY PLAN

The Contractor shall prepare a detailed Site Health and Safety Plan for all site personnel, that identifies potential health and safety hazards associated with each operation and specifies work practices that will be used to project workers from those hazards in conformance with the DTSC and CAL-OSHA regulations. At a minimum, the Site Health and Safety Plan shall identify key site safety personnel, describe risks associated with the work, describe training requirements, describe appropriate personal protective equipment, describe any site-specific medical surveillance requirements, describe any periodic air monitoring requirements, define appropriate site work zones, and describe any decontamination requirements. The Health and Safety Plan shall be submitted at least fifteen working days prior to beginning work for review and acceptance by the Engineer. Prior to submittal, the Contractor shall have the Site Health and Safety Plan approved by an Industrial Hygienist certified in comprehensive practice by the American Board of Industrial Hygiene. Subcontractors shall use the Site Health and Safety Plan prepared by the Contractor or prepare and submit a separate Site Health and Safety Plan in conformance with these special provisions.

SAFETY

Prior to performing work at the locations containing material classified as hazardous, all personnel, including State Personnel, shall complete a safety training program that communicates the potential health and safety hazards associated with work on the site and instructs the personnel in procedures for doing the work safely. The level of training provided shall be consistent with the person's job function on conforms to OSHA and CAL-OSHA regulations. The training, including subsequent training required until the completion of the work, shall be provided by the Contractor. The Contractor shall provide a certification of completion of the Safety Training Program to all personnel. Any personal protective equipment required by the Contractor’s Health & Safety Plan for personnel working within the exclusion zone will be supplied to State personnel by the Contractor. The number of State personnel requiring the above mentioned safety training program and personal protective equipment will be 5.

The decontamination area shall be located outside of the exclusion zone. Water from decontamination procedures shall be collected and disposed of at an appropriate disposal site by the Contractor. Non-reusable protective equipment, once used by any personnel, including State personnel, shall be collected and disposed of at an appropriate disposal site by the

Contractor. The Contractor shall implement a plan to prevent exposure of personnel working in hazardous material excavations.The contract lump sum price paid for Site Health and Safety Plan shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in preparing and implementing the Site Health and Safety Plan including paying the Certified Industrial Hygienist and for providing personal protective equipment, training and medical surveillance as specified in these special provisions and as directed by the Engineer.

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.

This project lies within the boundaries of the Central Valley Regional Water Quality Control Board (RWQCB).

The State Water Resources Control Board (SWRCB) has issued a permit to the Department which governs storm water and non-storm water discharges from its properties, facilities and activities. The Department's Permit is entitled: "Order No. 99-06-DWQ, NPDES No. CAS000003, National Pollutant Discharge Elimination System (NPDES) Permit, Storm Water Permit and Waste Discharge Requirements (WDRs) for the State of California, Department of Transportation Properties, Facilities, and Activities." Copies of the Department's Permit are available for review from the SWRCB, Storm Water Permit Unit, 1001 "I" Street, P.O. Box 1977, Sacramento, California 95812-1977, Telephone: (916) 341-5254, and may also be obtained from the SWRCB Internet website at: http://www.swrcb.ca.gov/stormwtr/caltrans.html.

The Department's Permit references and incorporates by reference the current Statewide General Permit issued by the SWRCB entitled "Order No. 99-08-DWQ, National Pollutant Discharge Elimination System (NPDES) General Permit No. CAS000002, Waste Discharge Requirements (WDRs) for Discharges of Storm Water Associated with Construction Activity," which regulates discharges of storm water and non-storm water from construction activities disturbing 2 or more hectares of soil in a common plan of development. Sampling and analysis requirements as specified in SWRCB Resolution No. 2001-46 are added to the Statewide General Permit. Copies of the Statewide General Permit and modifications thereto are available for review from the SWRCB, Storm Water Permit Unit, 1001 "I" Street, P.O. Box 1977, Sacramento, California 95812-1977, Telephone: (916) 341-5254 and may also be obtained from the SWRCB Internet website at: http://www.swrcb.ca.gov/stormwtr/construction.html.

The NPDES permit that regulate this project, as referenced above, are hereafter collectively referred to as the "Permits."

This project shall conform to the Permits and modifications thereto. The Contractor shall maintain copies of the Permits at the project site and shall make the Permits available during construction.

The Permits require the preparation of a Storm Water Pollution Prevention Plan (SWPPP). The SWPPP shall be prepared in conformance with the requirements of the Permits, the Department's "Storm Water Pollution Prevention Plan (SWPPP) and Water Pollution Control Program (WPCP) Preparation Manual," and the Department's "Construction Site Best Management Practices (BMPs) Manual," including addenda issued up to and including the date of advertisement of the project. These manuals are hereinafter referred to, respectively, as the "Preparation Manual" and the "Construction Site BMPs Manual," and collectively, as the "Manuals." Copies of the Manuals 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, and may also be obtained from the Department's Internet website at: http://www.dot.ca.gov/hq/construc/stormwater.html.

The Contractor shall know and fully comply with applicable provisions of the Permits and all modifications thereto, the Manuals, and Federal, State, and local regulations and requirements that govern the Contractor's operations and storm water and non-storm water discharges from both the project site and areas of disturbance outside the project limits during construction. Attention is directed to Sections 7-1.01, "Laws to be Observed," and 7-1.12, "Indemnification and Insurance," of the Standard Specifications.

The Permits shall apply to storm water and certain permitted non-storm water discharges from areas outside the project site which are directly related to construction activities for this contract including, but not limited to, asphalt batch plants, material borrow areas, concrete plants, staging areas, storage yards and access roads. The Contractor shall comply with the Permits and the Manuals for those areas and shall implement, inspect and maintain the required water pollution control practices. Installing, inspecting and maintaining water pollution control practices on areas outside the highway right of way not specifically arranged and provided for by the Department for the execution of this contract, will not be paid for.

The Contractor shall be responsible for penalties assessed or levied on the Contractor or the Department as a result of the Contractor's failure to comply with the provisions in this section "Water Pollution Control" including, but not limited to, compliance with the applicable provisions of the Permits, the Manuals, and Federal, State and local regulations and requirements as set forth therein.

Penalties as used in this section, "Water Pollution Control," shall include fines, penalties and damages, whether proposed, assessed, or levied against the Department or the Contractor, including those levied under the Federal Clean Water Act and the State Porter-Cologne Water Quality Control Act, by governmental agencies or as a result of citizen suits. Penalties shall also include payments made or costs incurred in settlement for alleged violations of the Permits, the Manuals,

or applicable laws, regulations, or requirements. Costs incurred could include sums spent instead of penalties, in mitigation or to remediate or correct violations.

RETENTION OF FUNDS

Notwithstanding any other remedies authorized by law, the Department may retain money due the Contractor under the contract, in an amount determined by the Department, up to and including the entire amount of Penalties proposed, assessed, or levied as a result of the Contractor's violation of the Permits, the Manuals, or Federal or State law, regulations or requirements. Funds may be retained by the Department until final disposition has been made as to the Penalties. The Contractor shall remain liable for the full amount of Penalties until such time as they are finally resolved with the entity seeking the Penalties.

Retention of funds for failure to conform to the provisions in this section, "Water Pollution Control," shall be in addition to the other retention amounts required by the contract. The amounts retained for the Contractor's failure to conform to provisions in this section will be released for payment on the next monthly estimate for partial payment following the date when an approved SWPPP has been implemented and maintained, and when water pollution has been adequately controlled, as determined by the Engineer.

When a regulatory agency identifies a failure to comply with the Permits and modifications thereto, the Manuals, or other Federal, State or local requirements, the Department may retain money due the Contractor, 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 entire amount of the Costs and Liabilities assessed or proposed in connection with the matter for which the retention was made, the Department shall be liable for interest on the amount retained for the period of the retention. The interest rate payable shall be 6 percent per annum.

During the first estimate period that the Contractor fails to conform to the provisions in this section, "Water Pollution Control," the Department may retain an amount equal to 25 percent of the estimated value of the contract work performed.

The Contractor shall notify the Engineer immediately upon request from the regulatory agencies to enter, inspect, sample, monitor, or otherwise access the project site or the Contractor's records pertaining to water pollution control work. The Contractor and the Department shall provide copies of correspondence, notices of violation, enforcement actions or proposed fines by regulatory agencies to the requesting regulatory agency.

STORM WATER POLLUTION PREVENTION PLAN PREPARATION, APPROVAL AND AMENDMENTS

As part of the water pollution control work, a Storm Water Pollution Prevention Plan (SWPPP) is required for this contract. The SWPPP shall conform to the provisions in Section 7-1.01G, "Water Pollution," of the Standard Specifications, the requirements in the Manuals, the requirements of the Permits, and these special provisions. Upon the Engineer's approval of the SWPPP, the SWPPP shall be considered to fulfill the provisions in Section 7-1.01G, "Water Pollution," of the Standard Specifications for development and submittal of a Water Pollution Control Program.

No work having potential to cause water pollution, shall be performed until the SWPPP has been approved by the Engineer. Approval shall not constitute a finding that the SWPPP complies with applicable requirements of the Permits, the Manuals and applicable Federal, State and local laws, regulations, and requirements.

The Contractor shall designate a Water Pollution Control Manager. The Water Pollution Control Manager shall be responsible for the preparation of the SWPPP and required modifications or amendments, and shall be responsible for the implementation and adequate functioning of the various water pollution control practices employed. The Contractor may designate different Water Pollution Control Managers to prepare the SWPPP and to implement the water pollution control practices. The Water Pollution Control Managers shall serve as the primary contact for issues related to the SWPPP or its implementation. The Contractor shall submit to the Engineer a statement of qualifications, describing the training, previous work history and expertise of the individual selected by the Contractor to serve as Water Pollution Control Manager. The Water Pollution Control Manager shall have a minimum of 24 hours of formal storm water management training or certification as a Certified Professional in Erosion and Sediment Control (CPESC). The Engineer will reject the Contractor's submission of a Water Pollution Control Manager if the submitted qualifications are deemed to be inadequate.

Within 30 working days after the approval of the contract, the Contractor shall submit 3 copies of the draft SWPPP to the Engineer. The Engineer will have 30 working days to review the SWPPP. If revisions are required, as determined by the Engineer, the Contractor shall revise and resubmit the SWPPP within 15 working days of receipt of the Engineer's comments. The Engineer will have 15 working days to review the revisions. Upon the Engineer's approval of the SWPPP, 4 approved copies of the SWPPP, incorporating the required changes, shall be submitted to the Engineer. In order to allow construction activities to proceed, the Engineer may conditionally approve the SWPPP while minor revisions are being completed. In the event the Engineer fails to complete the review within the time allowed, and if, in the opinion of the Engineer, completion of the work is delayed or interfered with by reason of the Engineer's delay in completing the review, the Contractor will be compensated for resulting losses, and an extension of time will be granted, in the same manner as provided for in Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

The SWPPP shall apply to the areas within or outside of the highway right of way that are directly related to construction including, but not limited to, asphalt batch plants, material borrow areas, concrete plants, staging areas, storage yards, and access roads.

The SWPPP shall incorporate water pollution control practices in the following categories:

A. Soil stabilization.
B. Sediment control.
C. Wind erosion control.
D. Tracking control.
E. Non-storm water management.
F. Waste management and materials pollution control.

The Contractor shall develop and include in the SWPPP the Sampling and Analysis Plan(s) as required by the Permits, and modifications thereto, and as required in "Sampling and Analytical Requirements" of this section.

The Contractor shall develop a Water Pollution Control Schedule that describes the timing of grading or other work activities that could affect water pollution. The Water Pollution Control Schedule shall be updated by the Contractor to reflect changes in the Contractor's operations that would affect the necessary implementation of water pollution control practices.

The Contractor shall complete the "Construction Site BMPs Consideration Checklist" presented in the Preparation Manual and shall incorporate water pollution control practices into the SWPPP. Water pollution control practices include the "Minimum Requirements" and other Contractor-selected water pollution control practices from the "Construction Site BMPs Consideration Checklist" and the "Project-Specific Minimum Requirements" identified in the Water Pollution Control Cost Break-Down of this section.

The SWPPP shall include, but not be limited to, the items described in the Manuals, Permits and related information contained in the contract documents. The SWPPP shall also include a copy of the following: Notification of Construction, Regional Water Quality Control Board 401 Certification, Fish and Game 1601 permit, US Army Corps of Engineers 404 permit.

The Contractor shall prepare an amendment to the SWPPP when there is a change in construction activities or operations which may affect the discharge of pollutants to surface waters, ground waters, municipal storm drain systems, or when the Contractor's activities or operations violate a condition of the Permits, or when directed by the Engineer. Amendments shall identify additional water pollution control practices or revised operations, including those areas or operations not identified in the initially approved SWPPP. Amendments to the SWPPP shall be prepared and submitted for review and approval within a time approved by the Engineer, but in no case longer than the time specified for the initial submittal and review of the SWPPP. At a minimum, the SWPPP shall be amended annually and submitted to the Engineer 25 days prior to the defined rainy season.

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

COST BREAK-DOWN

The Contractor shall include a Water Pollution Control Cost Break-Down in the SWPPP which itemizes the contract lump sum for water pollution control work. The Contractor shall use the Water Pollution Control Cost Break-Down provided in this section as the basis for the cost break-down submitted with the SWPPP. The Contractor shall use the Water Pollution Control Cost Break-Down to identify items, quantities and values for water pollution control work, excluding Temporary Water Pollution Control Practices for which there are separate bid items. The Contractor shall be responsible for the accuracy of the quantities and values used in the cost break-down submitted with the SWPPP. Partial payment for the item of water pollution control will not be made until the Water Pollution Control Cost Break-Down is approved by the Engineer.

Attention is directed to "Time-Related Overhead" of these special provisions regarding compensation for time-related overhead.

Line items indicated in the Water Pollution Control Cost Break-Down in this section with a specified Estimated Quantity shall be considered "Project-Specific Minimum Requirements." The Contractor shall incorporate Project-Specific Minimum Requirements with Contractor-designated quantities and values into the Water Pollution Control Cost Break-Down submitted with the SWPPP.

Line items indicated in the Water Pollution Control Cost Break-Down in this section without a specified Estimated Quantity shall be considered by the Contractor for selection to meet the applicable "Minimum Requirements" as defined in the Manuals, or for other water pollution control work as identified in the "Construction Site BMPs Consideration Checklist" presented in the Preparation Manual. In the Water Pollution Control Cost Break-Down submitted with the SWPPP, the Contractor shall list only those water pollution control practices selected for the project, including quantities and values required to complete the work for those items.

The sum of the amounts for the items of work listed in the Water Pollution Control Cost Break-Down shall be equal to the contract lump sum price bid for water pollution control. Overhead and profit, except for time-related overhead, shall be included in the individual items listed in the cost break-down.

WATER POLLUTION CONTROL COST BREAK-DOWN

Contract No. 10-049944

ITEM	ITEM DESCRIPTION	UNIT	ESTIMATED QUANTITY	VALUE	AMOUNT
SS-3	Hydraulic Mulch	M2			
SS-4	Hydroseeding	M2			
SS-5	Soil Binders	M2			
SS-6	Straw Mulch	M2			
SS-7	Geotextiles, Plastic Covers & Erosion Control Blankets/Mats	M2			
SS-8	Wood Mulching	M2			
SS-9	Earth Dikes/Drainage Swales & Lined Ditches	M			
SS-10	Outlet Protection/Velocity Dissipation Devices	EA			
SS-11	Slope Drains	EA			
SC-1	Silt Fence	M			
SC-2	Desilting Basin	EA			
SC-3	Sediment Trap	EA			
SC-4	Check Dam	EA			
SC-5	Fiber Rolls	M			

ITEM	ITEM DESCRIPTION	UNIT	ESTIMATED QUANTITY	VALUE	AMOUNT
SC-6	Gravel Bag Berm	M			
SC-7	Street Sweeping and Vacuuming	LS			
SC-8	Sandbag Barrier	M			
SC-9	Straw Bale Barrier	M			
SC-10	Storm Drain Inlet Protection	EA			
WE-1	Wind Erosion Control	LS			
TC-1	Stabilized Construction Entrance/Exit	EA			
TC-2	Stabilized Construction Roadway	EA			
TC-3	Entrance/Outlet Tire Wash	EA			
NS-1	Water Conservation Practices	LS			
NS-2	Dewatering Operations	EA			
NS-3	Paving and Grinding Operations	LS			
NS-4	Temporary Stream Crossing	EA			
NS-5	Clear Water Diversion	EA			
NS-6	Illicit Connection/Illegal Discharge Detection and Reporting	LS			
NS-7	Potable Water/Irrigation	LS			
NS-8	Vehicle and Equipment Cleaning	LS			
NS-9	Vehicle and Equipment Fueling	LS			
NS-10	Vehicle and Equipment Maintenance	LS			
WM-1	Material Delivery and Storage	LS			
WM-2	Material Use	LS			
WM-3	Stockpile Management	LS			
WM-4	Spill Prevention and Control	LS			
WM-5	Solid Waste Management	LS			
WM-6	Hazardous Waste Management	LS			
WM-7	Contaminated Soil Management	LS			
WM-8	Concrete Waste Management	LS			
WM-9	Sanitary/Septic Waste Management	LS			
WM-10	Liquid Waste Management	LS			

TOTAL _____

Adjustments in the items of work and quantities listed in the approved cost break-down shall be made when required to address amendments to the SWPPP, except when the adjusted items are paid for as extra work.

No adjustment in compensation will be made to the contract lump sum price paid for water pollution control due to differences between the quantities shown in the approved cost break-down and the quantities required to complete the work as shown on the approved SWPPP. No adjustment in compensation will be made for ordered changes to correct SWPPP work resulting from the Contractor's own operations or from the Contractor's negligence.

The approved cost break-down will be used to determine partial payments during the progress of the work and as the basis for calculating the adjustment in compensation for the item of water pollution control due to increases or decreases of quantities ordered by the Engineer. When an ordered change increases or decreases the quantities of an approved cost break-down item, the adjustment in compensation will be determined in the same manner specified for increases and decreases in the quantity of a contract item of work in conformance with the provisions in Section 4-1.03B, "Increased or Decreased Quantities," of the Standard Specifications. If an ordered change requires a new item which is not on the approved cost break-down, the adjustment in compensation will be determined in the same manner specified for extra work in conformance with Section 4-1.03D, "Extra Work," of the Standard Specifications.

If requested by the Contractor and approved by the Engineer, changes to the water pollution control practices listed in the approved cost break-down, including addition of new water pollution control practices, will be allowed. Changes shall be included in the approved amendment of the SWPPP. If the requested changes result in a net cost increase to the lump sum price for water pollution control, an adjustment in compensation will be made without change to the water pollution control item. The net cost increase to the water pollution control item will be paid for as extra work as provided in Section 4-1.03D, "Extra Work," of the Standard Specifications.

SWPPP IMPLEMENTATION

Unless otherwise specified, upon approval of the SWPPP, the Contractor shall be responsible throughout the duration of the project for installing, constructing, inspecting, maintaining, removing, and disposing of the water pollution control practices specified in the SWPPP and in the amendments. Unless otherwise directed by the Engineer, the Contractor's responsibility for SWPPP implementation shall continue throughout temporary suspensions 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 water pollution control practices shall conform to the requirements in the Manuals and these special provisions.

If the Contractor or the Engineer identifies a deficiency in the implementation of the approved SWPPP or amendments, the deficiency shall be corrected immediately unless requested by the Contractor and approved by the Engineer in writing, but shall be corrected prior to the onset of precipitation. If the Contractor fails to correct the identified deficiency by the date agreed or prior to the onset of precipitation, the project shall be in nonconformance with this section, "Water Pollution Control." Attention is directed to Section 5-1.01, "Authority of Engineer," of the Standard Specifications, and to "Retention of Funds" of this section for possible nonconformance penalties.

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

Implementation of water pollution control practices may vary by season. The Construction Site BMPs Manual and these special provisions shall be followed for control practice selection of year-round, rainy season and non-rainy season water pollution control practices.

Year-Round Implementation Requirements

The Contractor shall have a year-round program for implementing, inspecting and maintaining water pollution control practices for wind erosion control, tracking control, non-storm water management, and waste management and materials pollution control.

The National Weather Service weather forecast shall be monitored and used by the Contractor on a daily basis. An alternative weather forecast proposed by the Contractor may be used if approved by the Engineer. If precipitation is predicted, the necessary water pollution control practices shall be deployed prior to the onset of the precipitation.

Disturbed soil areas shall be considered active whenever the soil disturbing activities have occurred, continue to occur or will occur during the ensuing 21 days. Non-active areas shall be protected as prescribed in the Construction Site BMPs Manual within 14 days of cessation of soil disturbing activities or prior to the onset of precipitation, whichever occurs first.

In order to provide effective erosion control, the Contractor may be directed by the Engineer to apply permanent erosion control in small or multiple units. The Contractor’s attention is directed to "Erosion Control (Type C)", "Erosion Control (Type D)", "Erosion Control Blanket (Type 1)", and "Move-In/Move-Out (Erosion Control)" of these special provisions.

Rainy Season Implementation Requirements

Soil stabilization and sediment control practices conforming to the requirements of these special provisions shall be provided throughout the rainy season, defined as between October 15 and April 15.

An implementation schedule of required soil stabilization and sediment control practices for disturbed soil areas shall be completed no later than 20 days prior to the beginning of each rainy season. The implementation schedule shall identify the soil stabilization and sediment control practices and the dates when the implementation will be 25 percent, 50 percent and 100 percent complete, respectively. For construction activities beginning during the rainy season, the Contractor shall implement applicable soil stabilization and sediment control practices. The Contractor shall implement soil stabilization and sediment control practices a minimum of 10 days prior to the start of the rainy season.

Throughout the defined rainy season, the active disturbed soil area of the project site shall be not more than 2.0 hectares. The Engineer may approve, on a case-by-case basis, expansions of the active disturbed soil area limit. Soil stabilization and sediment control materials shall be maintained on site sufficient to protect disturbed soil areas. A detailed plan for the mobilization of sufficient labor and equipment shall be maintained to deploy the water pollution control practices required to protect disturbed soil areas prior to the onset of precipitation.

Non-Rainy Season Implementation Requirements

The non-rainy season shall be defined as days outside the defined rainy season. The Contractor's attention is directed to the Construction Site BMPs Manual for soil stabilization and sediment control implementation requirements on disturbed soil areas during the non-rainy season. Disturbed soil areas within the project shall be protected in conformance with the requirements in the Construction Site BMPs Manual with an effective combination of soil stabilization and sediment control.

MAINTENANCE

To ensure the proper implementation and functioning of water pollution control practices, the Contractor shall regularly inspect and maintain the construction site for the water pollution control practices identified in the SWPPP. The construction site shall be inspected by the Contractor as follows:

A. Prior to a forecast storm.
B. After a precipitation event which causes site runoff.
C. At 24 hour intervals during extended precipitation events.
D. Routinely, a minimum of once every two weeks outside of the defined rainy season.
E. Routinely, a minimum of once every week during the defined rainy season.

The Contractor shall use the Storm Water Quality Construction Site Inspection Checklist provided in the Preparation Manual or an alternative inspection checklist provided by the Engineer. One copy of each site inspection record shall be submitted to the Engineer within 24 hours of completing the inspection.

REPORTING REQUIREMENTS

Report of Discharges, Notices or Orders

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

A. The date, time, location, nature of the operation, and type of discharge, including the cause or nature of the notice or order.
B. The water pollution control practices deployed before the discharge event, or prior to receiving the notice or order.
C. The date of deployment and type of water pollution control practices deployed after the discharge event, or after receiving the notice or order, including additional measures installed or planned to reduce or prevent reoccurrence.
D. An implementation and maintenance schedule for affected water pollution control practices.

Report of First-Time Non-Storm Water Discharge

The Contractor shall notify the Engineer at least 3 days in advance of first-time non-storm water discharge events, excluding exempted discharges. The Contractor shall notify the Engineer of the operations causing non-storm water discharges and shall obtain field approval for first-time non-storm water discharges. Non-storm water discharges shall be monitored at first-time occurrences and routinely thereafter.

Annual Certifications

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

SAMPLING AND ANALYTICAL REQUIREMENTS

The Contractor is required to implement specific sampling and analytical procedures to determine whether BMPs implemented on the construction site are: (a) preventing further impairment by sediment in storm waters discharged into water bodies listed as impaired for sediment, siltation or turbidity and (b) preventing other pollutants that are known or should be known by permittees to occur on construction sites that are not visually detectable in storm water discharges, from causing or contributing to exceedances of water quality objectives.

The project has the potential to discharge non-visible pollutants in storm water from the construction site. The project SWPPP shall contain a Sampling and Analysis Plan (SAP) that describes the sampling and analysis strategy and schedule to be implemented on the project for monitoring non-visible pollutants in conformance with this section.

The SAP shall identify potential non-visible pollutants that are known or should be known to occur on the construction site associated with the following: (1) construction materials, wastes or operations; (2) known existing contamination due to historical site usage; or (3) application of soil amendments, including soil stabilization products, with the potential to alter pH or contribute toxic pollutants to storm water. Planned material and waste storage areas, locations of known existing contamination, and areas planned for application of soil amendments shall be shown on the SWPPP Water Pollution Control Drawings.

The SAP shall identify a sampling schedule for collecting a sample down gradient from the applicable non-visible pollutant source and a sufficiently large uncontaminated control sample during the first two hours of discharge from rain events during daylight hours which result in a sufficient discharge for sample collection. If run-on occurs onto the non-visible pollutant source, a run-on sample that is immediately down gradient of the run-on to the Department's right of way shall be collected. A minimum of 72 hours of dry weather shall occur between rain events to distinguish separate rain events.

The SAP shall state that water quality sampling will be triggered when any of the following conditions are observed during the required storm water inspections conducted before or during a rain event:

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

The SAP shall identify sampling locations for collecting down gradient and control samples, and the rationale for their selection. The control sampling location shall be selected where the sample does not come into contact with materials, wastes or areas associated with potential non-visible pollutants or disturbed soil areas. Sampling locations shall be shown on the SWPPP Water Pollution Control Drawings. Only trained personnel shall collect water quality samples and be identified in the SAP. Qualifications of designated sampling personnel shall describe training and experience, and shall be included in the SWPPP. The SAP shall state monitoring preparation, sample collection procedures, quality assurance/quality control, sample labeling procedures, sample collection documentation, sample shipping and chain of custody procedures, sample numbering system, and reference the construction site health and safety plan.

The SAP shall identify the analytical method to be used for analyzing down gradient and control samples for potential non-visible pollutants on the project. For samples analyzed in the field by sampling personnel, collection, analysis, and equipment calibration shall be in conformance with the Manufacturer's specifications. For samples that will be analyzed by a laboratory, sampling, preservation, and analysis shall be performed by a State-certified laboratory in conformance with 40 CFR 136. The SAP shall identify the specific State-certified laboratory, sample containers, preservation requirements, holding times, and analysis method to be used. A list of State-certified laboratories that are approved by the Department is available at the following internet site: http://www.dhs.ca.gov/ps/ls/elap/html/lablist_county.htm.

The Contractor shall submit a hard copy and electronic copy of water quality analytical results and quality assurance/quality control data to the Engineer within 5 days of sampling for field analyses and within 30 days for laboratory analyses. Analytical results shall be accompanied by an evaluation from the Contractor to determine if down gradient samples show elevated levels of the tested parameter relative to levels in the control sample. If down gradient or downstream samples, as applicable, show increased levels, the Contractor will assess the BMPs, site conditions, and surrounding influences to determine the probable cause for the increase. As determined by the assessment, the Contractor will repair or modify BMPs to address increases and amend the SWPPP as necessary. Electronic results (in one of the following file formats: .xls, .txt, .csv, .dbs, or .mdb) shall have at a minimum the following information: sample identification number, contract number, constituent, reported value, method reference, method detection limit, and reported detection limit. The Contractor shall document sample collection during rain events.

Water quality sampling documentation and analytical results shall be maintained with the SWPPP on the project site until a Notice of Completion has been submitted and approved.

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

PAYMENT

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

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

A. After the SWPPP has been approved by the Engineer, 75 percent of the contract item price for prepare storm water pollution prevention plan will be included in the monthly partial payment estimate.
B. After acceptance of the contract in conformance with the provisions in Section 7-1.17, "Acceptance of Contract," of the Standard Specifications, payment for the remaining 25 percent of the contract item price for prepare storm water pollution prevention plan will be made in conformance with the provisions in Section 9-1.07.

The contract lump sum price paid for water pollution control shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in installing, constructing, removing, and disposing of water pollution control practices, including non-storm water management, and waste management and materials pollution water pollution control practices, except those for which there is a contract item of work as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Storm water sampling and analysis will be paid for as extra work as provided in Section 4-1.03D, "Extra Work," of the Standard Specifications. No payment will be made for the preparation, collection, analysis, and reporting of storm water samples required where appropriate BMPs are not implemented prior to a rain event, or if a failure of a BMP is not corrected prior to a rain event.

For items identified on the approved Water Pollution Control Cost Break-Down, the cost of maintaining the temporary water pollution control practices shall be divided equally by the State and the Contractor as follows:

Soil Stabilization

Temporary water pollution control practices except:
SS-1 Scheduling
SS-2 Preservation of Existing Vegetation

Sediment Control

Temporary water pollution control practices except:
SC-7 Street Sweeping and Vacuuming

Wind Erosion Control

No sharing of maintenance costs will be allowed.

Tracking Control

TC-1 Stabilized Construction Entrance/Exit.

Non-Storm Water Management

No sharing of maintenance costs will be allowed.

Waste Management & Materials Pollution Control

No sharing of maintenance costs will be allowed.

The division of cost will be made by determining the cost of maintaining water pollution control practices in conformance with the provisions in Section 9-1.03, "Force Account Payment," of the Standard Specifications and paying to the Contractor one-half of that cost. Cleanup, repair, removal, disposal, improper installation, and replacement of water pollution control practices damaged by the Contractor's negligence, shall not be considered as included in the cost for performing maintenance.

The provisions for sharing maintenance costs shall not relieve the Contractor from the responsibility for providing appropriate maintenance on items with no shared maintenance costs.

Full compensation for non-shared maintenance costs of water pollution control practices, as specified in this section, "Water Pollution Control," shall be considered as included in the contract lump sum price paid for water pollution control and no additional compensation will be allowed therefor.

Water pollution control practices for which there is a contract item of work, will be measured and paid for as that contract item of work.

10-1.04 TEMPORARY ENVIRONMENTAL FENCE

Temporary environmental fence shall be furnished, constructed, maintained, and later removed as shown on the plans, as specified in these special provisions and as directed by the Engineer.

Attention is directed to "Environmentally Sensitive Area" elsewhere in these special provisions.

Used materials may be installed provided the used materials are good, sound and are suitable for the purpose intended, as determined by the Engineer.

Fabric for temporary environmental fence shall be commercial quality, 1.2 meters high, brightly colored plastic mesh.

Posts shall be commercial quality metal fence posts spaced at not more than 3.0 meter intervals.

Temporary environmental fence that is damaged during the progress of the work shall be repaired or replaced by the Contractor at the Contractor's expense.

When no longer required for the work, as determined by the Engineer, temporary environmental fence shall be removed. Removed temporary environmental fence shall become the property of the Contractor and shall be removed from the site of the work, except as otherwise provided in this section.

Holes caused by the removal of temporary environmental fence shall be backfilled in conformance with the provisions in the second paragraph of Section 15-1.02, "Preservation of Property," of the Standard Specifications.

The temporary environmental fence will be measured and paid for in the same manner specified for permanent fence of similar character as provided in Section 80, "Fences," of the Standard Specifications.

Full compensation for maintaining, removing, and disposing of temporary environmental fence shall be considered as included in the contract prices paid per meter for temporary environmental fence and no additional compensation will be allowed therefor.

10-1.05 PRESERVATION OF PROPERTY

Attention is directed to Section 7-1.11, "Preservation of Property," of the Standard Specifications and these special provisions.

Existing trees, shrubs and other plants, that are not to be removed as designated by the Engineer, and are injured or damaged by reason of the Contractor's operations, shall be replaced by the Contractor. The minimum size of tree replacement shall be 610 mm box and the minimum size of shrub replacement shall be No. 15 container. Replacement ground cover plants shall be from flats and shall be planted 300 mm on center. Replacement of Carpobrotus ground cover plants shall be from cuttings and shall be planted 300 mm on center. Replacement planting shall conform to the

requirements in Section 20-4.07, "Replacement," of the Standard Specifications. The Contractor shall water replacement plants in conformance with the provisions in Section 20-4.06, "Watering," of the Standard Specifications.

Damaged or injured plants shall be removed and disposed of outside the highway right of way in conformance with the provisions in Section 7-l.13 of the Standard Specifications. At the option of the Contractor, removed trees and shrubs may be reduced to chips. The chipped material shall be spread within the highway right of way at locations designated by the Engineer.

Replacement planting of injured or damaged trees, shrubs and other plants shall be completed not less than 20 working days prior to acceptance of the contract. Replacement plants shall be watered as necessary to maintain the plants in a healthy condition.

10-1.06 PROGRESS SCHEDULE (CRITICAL PATH METHOD)

The Contractor shall submit to the Engineer practicable critical path method (CPM) progress schedules in conformance with these special provisions. Whenever the term "schedule" is used in this section it shall mean CPM progress schedule.

Attention is directed to "Payments" of Section 5 of these special provisions.

The provisions in Section 8-1.04, "Progress Schedule," of the Standard Specifications shall not apply.

DEFINITIONS

The following definitions shall apply to this section:

A. ACTIVITY.—A task, event or other project element on a schedule that contributes to completing the project. Activities have a description, start date, finish date, duration and one or more logic ties.
B. BASELINE SCHEDULE.—The initial schedule representing the Contractor's work plan on the first working day of the project.
C. CONTRACT COMPLETION DATE.—The current extended date for completion of the contract shown on the weekly statement of working days furnished by the Engineer in conformance with the provisions in Section 8-1.06, "Time of Completion," of the Standard Specifications.
D. CRITICAL PATH.—The longest continuous chain of activities for the project that has the least amount of total float of all chains. In general, a delay on the critical path will extend the scheduled completion date.
E. CRITICAL PATH METHOD (CPM).—A network based planning technique using activity durations and the relationships between activities to mathematically calculate a schedule for the entire project.
F. DATA DATE.—The day after the date through which a schedule is current. Everything occurring earlier than the data date is "as-built" and everything on or after the data date is "planned."
G. EARLY COMPLETION TIME.—The difference in time between an early scheduled completion date and the contract completion date.
H. FLOAT.—The difference between the earliest and latest allowable start or finish times for an activity.
I. MILESTONE.—An event activity that has zero duration and is typically used to represent the beginning or end of a certain stage of the project.
J. NARRATIVE REPORT.—A document submitted with each schedule that discusses topics related to project progress and scheduling.
K. NEAR CRITICAL PATH.—A chain of activities with total float exceeding that of the critical path but having no more than 10 working days of total float.
L. SCHEDULED COMPLETION DATE.—The planned project finish date shown on the current accepted schedule.
M. STATE OWNED FLOAT ACTIVITY.—The activity documenting time saved on the critical path by actions of the State. It is the last activity prior to the scheduled completion date.
N. TIME IMPACT ANALYSIS.—A schedule and narrative report developed specifically to demonstrate what effect a proposed change or delay has on the current scheduled completion date.
O. TOTAL FLOAT.—The amount of time that an activity or chain of activities can be delayed before extending the scheduled completion date.
P. UPDATE SCHEDULE.—A current schedule developed from the baseline or subsequent schedule through regular monthly review to incorporate as-built progress and any planned changes.

GENERAL REQUIREMENTS

The Contractor shall submit to the Engineer baseline, monthly update and final update schedules, each consistent in all respects with the time and order of work requirements of the contract. The project work shall be executed in the sequence indicated on the current accepted schedule.

Schedules shall show the order in which the Contractor proposes to carry out the work with logical links between time-scaled work activities, and calculations made using the critical path method to determine the controlling operation or

operations. The Contractor is responsible for assuring that all activity sequences are logical and that each schedule shows a coordinated plan for complete performance of the work.

The Contractor shall produce schedules using computer software and shall furnish compatible software for the Engineer's exclusive possession and use. The Contractor shall furnish network diagrams, narrative reports, tabular reports and schedule data as parts of each schedule submittal.

Schedules shall include, but not be limited to, activities that show the following that are applicable to the project:

A. Project characteristics, salient features, or interfaces, including those with outside entities, that could affect time of completion.
B. Project start date, scheduled completion date and other milestones.
C. Work performed by the Contractor, subcontractors and suppliers.
D. Submittal development, delivery, review and approval, including those from the Contractor, subcontractors and suppliers.
E. Procurement, delivery, installation and testing of materials, plants and equipment.
F. Testing and settlement periods.
G. Utility notification and relocation.
H. Erection and removal of falsework and shoring.
I. Major traffic stage switches.
J. Finishing roadway and final cleanup.
K. State-owned float as the predecessor activity to the scheduled completion date.

Schedules shall have not less than 50 and not more than 500 activities, unless otherwise authorized by the Engineer. The number of activities shall be sufficient to assure adequate planning of the project, to permit monitoring and evaluation of progress, and to do an analysis of time impacts.

Schedule activities shall include the following:

A. A clear and legible description.
B. Start and finish dates.
C. A duration of not less than one working day, except for event activities, and not more than 20 working days, unless otherwise authorized by the Engineer.
D. At least one predecessor and one successor activity, except for project start and finish milestones.
E. Required constraints.
F. Codes for responsibility, stage, work shifts, location and contract pay item numbers.

The Contractor may show early completion time on any schedule provided that the requirements of the contract are met. Early completion time shall be considered a resource for the exclusive use of the Contractor. The Contractor may increase early completion time by improving production, reallocating resources to be more efficient, performing sequential activities concurrently or by completing activities earlier than planned. The Contractor may also submit for approval a cost reduction incentive proposal in conformance with the provisions in Section 5-1.14, "Cost Reduction Incentive," of the Standard Specifications that will reduce time of construction.

The Contractor may show a scheduled completion date that is later than the contract completion date on an update schedule, after the baseline schedule is accepted. The Contractor shall provide an explanation for a late scheduled completion date in the narrative report that is included with the schedule.

State-owned float shall be considered a resource for the exclusive use of the State. The Engineer may accrue State-owned float by the early completion of review of any type of required submittal when it saves time on the critical path. The Contractor shall prepare a time impact analysis, when requested by the Engineer, to determine the effect of the action in conformance with the provisions in "Time Impact Analysis" specified herein. The Engineer will document State-owned float by directing the Contractor to update the State-owned float activity on the next update schedule. The Contractor shall include a log of the action on the State-owned float activity and include a discussion of the action in the narrative report. The Engineer may use State-owned float to mitigate past, present or future State delays by offsetting potential time extensions for contract change orders.

The Engineer may adjust contract working days for ordered changes that affect the scheduled completion date, in conformance with the provisions in Section 4-1.03, "Changes," of the Standard Specifications. The Contractor shall prepare a time impact analysis to determine the effect of the change in conformance with the provisions in "Time Impact Analysis" specified herein, and shall include the impacts acceptable to the Engineer in the next update schedule. Changes that do not affect the controlling operation on the critical path will not be considered as the basis for a time adjustment. Changes that do affect the controlling operation on the critical path will be considered by the Engineer in decreasing time or granting an

extension of time for completion of the contract. Time extensions will only be granted if the total float is absorbed and the scheduled completion date is delayed one or more working days because of the ordered change.

The Engineer's review and acceptance of schedules shall not waive any contract requirements and shall not relieve the Contractor of any obligation thereunder or responsibility for submitting complete and accurate information. Schedules that are rejected shall be corrected by the Contractor and resubmitted to the Engineer within 5 working days of notification by the Engineer, at which time a new review period of one week will begin.

Errors or omissions on schedules shall not relieve the Contractor from finishing all work within the time limit specified for completion of the contract. If, after a schedule has been accepted by the Engineer, either the Contractor or the Engineer discover that any aspect of the schedule has an error or omission, it shall be corrected by the Contractor on the next update schedule.

COMPUTER SOFTWARE

The Contractor shall submit to the Engineer for approval a description of proposed software before delivery. The software shall be the current version of Primavera SureTrak Project Manager for Windows, or equal, and shall be compatible with Windows NT (version 4.0) operating system. If software other than SureTrak is proposed, it shall be capable of generating files that can be imported into SureTrak.

The Contractor shall furnish schedule software and all original software instruction manuals to the Engineer with submittal of the baseline schedule. The furnished schedule software shall become the property of the State and will not be returned to the Contractor. The State will compensate the Contractor in conformance with the provisions in Section 4-1.03, "Extra Work," of the Standard Specifications for replacement of software which is damaged, lost or stolen after delivery to the Engineer.

The Contractor shall instruct the Engineer in the use of the software and provide software support until the contract is accepted. Within 20 working days of contract approval, the Contractor shall provide a commercial 8-hour training session for 2 Department employees in the use of the software at a location acceptable to the Engineer. It is recommended that the Contractor also send at least 2 employees to the same training session to facilitate development of similar knowledge and skills in the use of the software. If software other than SureTrak is furnished, then the training session shall be a total of 16-hours for each Department employee.

NETWORK DIAGRAMS, REPORTS AND DATA

The Contractor shall include the following for each schedule submittal:

A. Two sets of originally plotted, time-scaled network diagrams.
B. Two copies of a narrative report.
C. Two copies of each of 3 sorts of the CPM software-generated tabular reports.
D. One 1.44-megabyte 90 mm (3.5 inch) floppy diskette containing the schedule data.

The time-scaled network diagrams shall conform to the following:

A. Show a continuous flow of information from left to right.
B. Be based on early start and early finish dates of activities.
C. Clearly show the primary paths of criticality using graphical presentation.
D. Be prepared on E-size sheets, 860 mm x 1120 mm (34 inch x 44 inch).
E. Include a title block and a timeline on each page.

The narrative report shall be organized in the following sequence with all applicable documents included:

A. Contractor's transmittal letter.
B. Work completed during the period.
C. Identification of unusual conditions or restrictions regarding labor, equipment or material; including multiple shifts, 6-day work weeks, specified overtime or work at times other than regular days or hours.
D. Description of the current critical path.
E. Changes to the critical path and scheduled completion date since the last schedule submittal.
F. Description of problem areas.
G. Current and anticipated delays:

    1. Cause of delay.
    2. Impact of delay on other activities, milestones and completion dates.

3. Corrective action and schedule adjustments to correct the delay.

H. Pending items and status thereof:

1. Permits
2. Change orders
3. Time adjustments
4. Non-compliance notices

I. Reasons for an early or late scheduled completion date in comparison to the contract completion date.

Tabular reports shall be software-generated and provide information for each activity included in the project schedule. Three different reports shall be sorted by (1) activity number, (2) early start and (3) total float. Tabular reports shall be 215 mm x 280 mm (8 1/2 inch x 11 inch) in size and shall include, as a minimum, the following applicable information:

A. Data date
B. Activity number and description
C. Predecessor and successor activity numbers and descriptions
D. Activity codes
E. Scheduled, or actual and remaining durations (work days) for each activity
F. Earliest start (calendar) date
G. Earliest finish (calendar) date
H. Actual start (calendar) date
I. Actual finish (calendar) date
J. Latest start (calendar) date
K. Latest finish (calendar) date
L. Free float (work days)
M. Total float (work days)
N. Percentage of activity complete and remaining duration for incomplete activities.
O. Lags
P. Required constraints

Schedule submittals will only be considered complete when all documents and data have been provided as described above.

PRE-CONSTRUCTION SCHEDULING CONFERENCE

The Contractor shall schedule and the Engineer will conduct a pre-construction scheduling conference with the Contractor's project manager and construction scheduler within 10 working days of the approval of the contract. At this meeting the Engineer will review the requirements of this section of the special provisions with the Contractor.

The Contractor shall submit a general time-scaled logic diagram displaying the major activities and sequence of planned operations and shall be prepared to discuss the proposed work plan and schedule methodology that comply with the requirements of these special provisions. If the Contractor proposes deviations to the construction staging of the project, then the general time-scaled logic diagram shall also display the deviations and resulting time impacts. The Contractor shall be prepared to discuss the proposal.

At this meeting, the Contractor shall additionally submit the alphanumeric coding structure and the activity identification system for labeling the work activities. To easily identify relationships, each activity description shall indicate its associated scope or location of work by including such terms as quantity of material, type of work, bridge number, station to station location, side of highway (such as left, right, northbound, southbound), lane number, shoulder, ramp name, ramp line descriptor or mainline.

The Engineer will review the logic diagram, coding structure, and activity identification system, and provide any required baseline schedule changes to the Contractor for implementation.

BASELINE SCHEDULE

Beginning the week following the pre-construction scheduling conference, the Contractor shall meet with the Engineer weekly until the baseline schedule is accepted by the Engineer to discuss schedule development and resolve schedule issues.

The Contractor shall submit to the Engineer a baseline schedule within 20 working days of approval of the contract. The Contractor shall allow 3 weeks for the Engineer's review after the baseline schedule and all support data are submitted. In addition, the baseline schedule submittal will not be considered complete until the computer software is delivered and installed for use in review of the schedule.

The baseline schedule shall include the entire scope of work and how the Contractor plans to complete all work contemplated. The baseline schedule shall show the activities that define the critical path. Multiple critical paths and near-critical paths shall be kept to a minimum. A total of not more than 50 percent of the baseline schedule activities shall be critical or near critical, unless otherwise authorized by the Engineer.

The baseline schedule shall not extend beyond the number of working days specified in these special provisions. The baseline schedule shall have a data date of the first working day of the contract and not include any completed work to date. The baseline schedule shall not attribute negative float or negative lag to any activity.

If the Contractor submits an early completion baseline schedule that shows contract completion in less than 85 percent of the working days specified in these special provisions, the baseline schedule shall be supplemented with resource allocations for every task activity and include time-scaled resource histograms. The resource allocations shall be shown to a level of detail that facilitates report generation based on labor crafts and equipment classes for the Contractor and subcontractors. The Contractor shall use average composite crews to display the labor loading of on-site construction activities. The Contractor shall optimize and level labor to reflect a reasonable plan for accomplishing the work of the contract and to assure that resources are not duplicated in concurrent activities. The time-scaled resource histograms shall show labor crafts and equipment classes to be utilized on the contract. The Engineer may review the baseline schedule activity resource allocations using Means Productivity Standards or equivalent to determine if the schedule is practicable.

UPDATE SCHEDULE

The Contractor shall submit an update schedule and meet with the Engineer to review contract progress, on or before the first day of each month, beginning one month after the baseline schedule is accepted. The Contractor shall allow 2 weeks for the Engineer's review after the update schedule and all support data are submitted, except that the review period shall not start until the previous month's required schedule is accepted. Update schedules that are not accepted or rejected within the review period will be considered accepted by the Engineer.

The update schedule shall have a data date of the twenty-first day of the month or other date established by the Engineer. The update schedule shall show the status of work actually completed to date and the work yet to be performed as planned. Actual activity start dates, percent complete and finish dates shall be shown as applicable. Durations for work that has been completed shall be shown on the update schedule as the work actually occurred, including Engineer submittal review and Contractor resubmittal times.

The Contractor may include modifications such as adding or deleting activities or changing activity constraints, durations or logic that do not (1) alter the critical path(s) or near critical path(s) or (2) extend the scheduled completion date compared to that shown on the current accepted schedule. The Contractor shall state in writing the reasons for any changes to planned work. If any proposed changes in planned work will result in (1) or (2) above, then the Contractor shall submit a time impact analysis as described herein.

TIME IMPACT ANALYSIS

The Contractor shall submit a written time impact analysis (TIA) to the Engineer with each request for adjustment of contract time, or when the Contractor or Engineer consider that an approved or anticipated change may impact the critical path or contract progress.

The TIA shall illustrate the impacts of each change or delay on the current scheduled completion date or internal milestone, as appropriate. The analysis shall use the accepted schedule that has a data date closest to and prior to the event. If the Engineer determines that the accepted schedule used does not appropriately represent the conditions prior to the event, the accepted schedule shall be updated to the day before the event being analyzed. The TIA shall include an impact schedule developed from incorporating the event into the accepted schedule by adding or deleting activities, or by changing durations or logic of existing activities. If the impact schedule shows that incorporating the event modifies the critical path and scheduled completion date of the accepted schedule, the difference between scheduled completion dates of the two schedules shall be equal to the adjustment of contract time. The Engineer may construct and utilize an appropriate project schedule or other recognized method to determine adjustments in contract time until the Contractor provides the TIA.

The Contractor shall submit a TIA in duplicate within 15 working days of receiving a written request for a TIA from the Engineer. The Contractor shall allow the Engineer 2 weeks after receipt to approve or reject the submitted TIA. All approved TIA schedule changes shall be shown on the next update schedule.

If a TIA submitted by the Contractor is rejected by the Engineer, the Contractor shall meet with the Engineer to discuss and resolve issues related to the TIA. If agreement is not reached, the Contractor will be allowed 15 days from the meeting with the Engineer to give notice in conformance with the provisions in Section 9-1.04, "Notice of Potential Claim," of the Standard Specifications. The Contractor shall only show actual as-built work, not unapproved changes related to the TIA, in subsequent update schedules. If agreement is reached at a later date, approved TIA schedule changes shall be shown on the next update schedule. The Engineer will withhold remaining payment on the schedule contract item if a TIA is requested by the Engineer and not submitted by the Contractor within 15 working days. The schedule item payment will resume on the next estimate after the requested TIA is submitted. No other contract payment will be retained regarding TIA submittals.

FINAL UPDATE SCHEDULE

The Contractor shall submit a final update, as-built schedule with actual start and finish dates for the activities, within 30 days after completion of contract work. The Contractor shall provide a written certificate with this submittal signed by the Contractor's project manager and an officer of the company stating, "To my knowledge and belief, the enclosed final update schedule reflects the actual start and finish dates of the actual activities for the project contained herein." An officer of the company may delegate in writing the authority to sign the certificate to a responsible manager.

RETENTION

The Department will retain an amount equal to 25 percent of the estimated value of the work performed during each estimate period in which the Contractor fails to submit an acceptable schedule conforming to the requirements of these special provisions as determined by the Engineer. Schedule retentions will be released for payment on the next monthly estimate for partial payment following the date that acceptable schedules are submitted to the Engineer or as otherwise specified herein. Upon completion of all contract work and submittal of the final update schedule and certification, any remaining retained funds associated with this section, "Progress Schedule (Critical Path Method)", will be released for payment. Retentions held in conformance with this section shall be in addition to other retentions provided for in the contract. No interest will be due the Contractor on retention amounts.

PAYMENT

Progress schedule (critical path method) will be paid for at a lump sum price. The contract lump sum price paid for progress schedule (critical path method) shall include full compensation for furnishing all labor, material, tools, equipment, and incidentals, including computer software, and for doing all the work involved in preparing, furnishing, and updating schedules, and instructing and assisting the Engineer in the use of computer software, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Payments for the progress schedule (critical path method) contract item will be made progressively as follows:

A. A total of 25 percent of the item amount or a total of 25 percent of the amount listed for progress schedule (critical path method) in "Payments" of Section 5 of these special provisions, whichever is less, will be paid upon achieving all of the following:

    1. Completion of 5 percent of all contract item work.
    2. Acceptance of all schedules and TIAs required to the time when 5 percent of all contract item work is complete.
    3. Delivery of schedule software to the Engineer.
    4. Completion of required schedule software training.

B. A total of 50 percent of the item amount or a total of 50 percent of the amount listed for progress schedule (critical path method) in "Payments" of Section 5 of these special provisions, whichever is less, will be paid upon completion of 25 percent of all contract item work and acceptance of all schedules and TIAs required to the time when 25 percent of all contract item work is complete.

C. A total of 75 percent of the item amount or a total of 75 percent of the amount listed for progress schedule (critical path method) in "Payments" of Section 5 of these special provisions, whichever is less, will be paid upon completion of 50 percent of all contract item work and acceptance of all schedules and TIAs required to the time when 50 percent of all contract item work is complete.

D. A total of 100 percent of the item amount or a total of 100 percent of the amount listed for progress schedule (critical path method) in "Payments" of Section 5 of these special provisions, whichever is less, will be paid upon completion of all contract item work, acceptance of all schedules and TIAs required to the time when all contract item work is complete, and submittal of the certified final update schedule.

If the Contractor fails to complete any of the work or provide any of the schedules required by this section, the Engineer shall make an adjustment in compensation in conformance with the provisions in Section 4-1.03C, "Changes in Character of Work," of the Standard Specifications for the work not performed. Adjustments in compensation for schedules will not be made for any increased or decreased work ordered by the Engineer in furnishing schedules.

10-1.07 TIME-RELATED OVERHEAD

The Contractor will be compensated for time-related overhead in conformance with these special provisions.

Attention is directed to "Beginning of Work, Time of Completion and Liquidated Damages," "Force Account Payment," and "Progress Schedule (Critical Path Method)" of these special provisions.

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

Time-related overhead shall consist of those overhead costs, including field and home office overhead, that are in proportion to the time required to complete the work. Time-related overhead shall not include costs that are not related to time, including but not limited to, mobilization, licenses, permits, and other charges incurred only once during the contract.

Field office overhead expenses include time-related costs associated with the normal and recurring operations of the construction project, and shall not include costs directly attributable to the work of the contract. Time-related costs of field office overhead include, but are not limited to, salaries, benefits, and equipment costs of project managers, general superintendents, field office managers and other field office staff assigned to the project, and rent, utilities, maintenance, security, supplies, and equipment costs of the project field office.

Home office overhead or general and administrative expenses refer to the fixed costs of operating the Contractor's business. These costs include, but are not limited to, general administration, insurance, personnel and subcontract administration, purchasing, accounting, and project engineering and estimating. Home office overhead costs shall exclude expenses specifically related to other contracts or other businesses of the Contractor, equipment coordination, material deliveries, and consultant and legal fees.

The quantity of time-related overhead associated with a reduction in contract time for cost reduction incentive proposals accepted and executed in conformance with the provisions in Section 5-1.14, "Cost Reduction Incentive," of the Standard Specifications shall be considered a construction cost attributable to the resultant estimated net savings due to the cost reduction incentive.

If the final increased quantity of time-related overhead exceeds 149 percent of the number of working days specified in the Engineer's Estimate, the Contractor shall, within 60 days of the Engineer's written request, submit to the Engineer an audit examination and report performed by an independent Certified Public Accountant of the Contractor's actual overhead costs. The independent Certified Public Accountant's audit examination shall be performed in conformance with the requirements of the American Institute of Certified Public Accountants Attestation Standards. The audit examination and report shall depict the Contractor's project and company-wide financial records and shall specify the actual overall average daily rates for both field and home office overhead for the entire duration of the project, and whether the costs have been properly allocated. The rates of field and home office overhead shall exclude unallowable costs as determined in the Federal Acquisition Regulations, 48 CFR, Chapter 1, Part 31. The audit examination and report shall determine if the rates of field office overhead and home office overhead are:

A. Allowable in conformance with the requirements of the Federal Acquisition Regulations, 48 CFR, Chapter 1, Part 31.
B. Adequately supported by reliable documentation.
C. Related solely to the project under examination.

Within 20 days of the Engineer's written request, the Contractor shall make its financial records available for audit by the State for the purpose of verifying the actual rate of time-related overhead specified in the audit submitted by the Contractor. The actual rate of time-related overhead specified in the audit, submitted by the Contractor, will be subject to approval by the Engineer.

If the Engineer requests the independent Certified Public Accountant audit, or if it is requested in writing by the Contractor, the contract item payment rate for time-related overhead, in excess of 149 percent of the number of working days specified in the Engineer's Estimate, will be adjusted to reflect the actual rate.

The cost of performing an independent Certified Public Accountant audit examination and submitting the report, requested by the Engineer, will be borne equally by the State and the Contractor. The division of the cost will be made by determining the cost of providing an audit examination and report in conformance with the provisions of Section 9-1.03B, "Work Performed by Special Forces or Other Special Services," of the Standard Specifications, and paying to the Contractor one-half of that cost. The cost of performing an audit examination and submitting the independent Certified Public Accountant audit report for overhead claims other than for the purpose of verifying the actual rate of time-related overhead shall be entirely borne by the Contractor.

The quantity of time-related overhead to be paid will be measured by the working day, designated in the Engineer's Estimate as WDAY. The estimated number of working days is the number of working days, excluding days for plant establishment, as specified in "Beginning of Work, Time of Completion and Liquidated Damages" of these special provisions. The quantity of time-related overhead will be increased or decreased only as a result of suspensions or adjustments of contract time which revise the current contract completion date, and which satisfy any of the following criteria:

A. Suspensions of work ordered in conformance with the provisions in Section 8-1.05, "Temporary Suspension of Work," of the Standard Specifications, except:

    1. Suspensions ordered due to weather conditions being unfavorable for the suitable prosecution of the controlling operation or operations.
    2. Suspensions ordered due to the failure on the part of the Contractor to carry out orders given, or to perform the provisions of the contract.
    3. Other suspensions mutually agreed upon between the Engineer and the Contractor.

B. Extensions of contract time granted by the State in conformance with the provisions in the fifth paragraph in Section 8-1.07, "Liquidated Damages," of the Standard Specifications and set forth in approved contract change orders, in conformance with the provisions in Section 4-1.03, "Changes," of the Standard Specifications.
C. Reductions in contract time set forth in approved contract change orders, in conformance with the provisions in Section 4-1.03, "Changes," of the Standard Specifications.

In the event an early completion progress schedule, as defined in "Progress Schedule (Critical Path Method)" of these special provisions, is submitted by the Contractor and approved by the Engineer, the amount of time-related overhead eligible for payment will be based on the total number of working days for the project, in conformance with the provisions in "Beginning of Work, Time of Completion and Liquidated Damages" of these special provisions, rather than the Contractor's early completion progress schedule.

The contract price paid per working day for time-related overhead shall include full compensation for time-related overhead, including the Contractor's share of costs of the independent Certified Public Accountant audit of overhead costs requested by the Engineer, as specified in these special provisions, and as directed by the Engineer.

The provisions in Sections 4-1.03B, "Increased or Decreased Quantities," and 4-1.03C, "Changes in Character of the Work," of the Standard Specifications shall not apply to the contract item of time-related overhead.

Full compensation for additional overhead costs incurred during days of inclement weather when the contract work is extended into additional construction seasons due to delays caused by the State shall be considered as included in the time-related overhead paid during the contract working days, and no additional compensation will be allowed therefor.

Full compensation for additional overhead costs involved in performing additional contract item work that is not a controlling operation shall be considered as included in the contract items of work involved and no additional compensation will be allowed therefor.

Full compensation for overhead, other than time-related overhead measured and paid for as specified above, and other than overhead costs included in the markups specified in "Force Account Payment" of these special provisions, shall be considered as included in the various items of work and no additional compensation will be allowed therefor.

Overhead costs incurred by joint venture partners, subcontractors, suppliers or other parties associated with the Contractor shall be considered as included in the various overhead costs for which the Contractor is compensated, and no additional compensation will be allowed therefor.

For the purpose of making partial payments pursuant to the provisions in Section 9-1.06, "Partial Payments," of the Standard Specifications, the number of working days to be paid for time-related overhead in each monthly partial payment will be the number of working days, specified above to be measured for payment that occurred during that monthly estimate period, including compensable suspensions and right of way delays. Working days granted by contract change order due to extra work or changes in character of the work, will be paid for upon completion of the contract. The amount earned per working day for time-related overhead shall be the lesser of the following amounts:

A) The contract item price.
B) Twenty percent of the original total contract amount divided by the number of working days specified in "Beginning of Work, Time of Completion and Liquidated Damages," of these special provisions.

After acceptance of the contract in conformance with the provisions in Section 7-1.17, "Acceptance of Contract," of the Standard Specifications, the amount of the total contract item price for time-related overhead not yet paid, will be included for payment in the first estimate made after acceptance of the contract in conformance with the provisions in Section 9-1.07, "Payment After Acceptance," of the Standard Specifications.

10-1.08 OBSTRUCTIONS

Attention is directed to Section 8-1.10, "Utility and Non-Highway Facilities," and Section 15, "Existing Highway Facilities," of the Standard Specifications and these special provisions.

Attention is directed to the existence of certain underground facilities that may require special precautions be taken by the Contractor to protect the health, safety and welfare of workers and of the public. Facilities requiring special precautions include, but are not limited to: conductors of petroleum products, oxygen, chlorine, and toxic or flammable gases; natural gas in pipelines greater than 150 mm in diameter or pipelines operating at pressures greater than 415 kPa (gage); underground electric supply system conductors or cables, with potential to ground of more than 300 V, either directly buried or in a duct or conduit which do not have concentric grounded or other effectively grounded metal shields or sheaths.

The Contractor shall notify the Engineer and the appropriate regional notification center for operators of subsurface installations at least 2 working days, but not more than 14 calendar days, prior to performing any excavation or other work close to any underground pipeline, conduit, duct, wire or other structure. 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

It is anticipated that the following utility facilities will be relocated prior to the dates shown:

Utility	Location	Date
152 mm HP Gas (PG&E)	23+20 Route 49 to 13+93 Old Route 49	6/1/2003
Sewer Line	31+40 to 32+30 Route 49	6/1/2003
Sewer Line Crossing	38+90	6/1/2003
Sewer Line	37+15 Sutter Ione Rd to 55+00 Route 49	6/1/2003
Sewer Line	58+60 to 61+00 Route 49	6/1/2003
Sewer Line Crossing	32+23 Route 49	6/1/2003
Sewer Line Crossing	36+05	6/1/2003

Installation of the following utility facilities will require coordination with the Contractor's operations. The Contractor shall make the necessary arrangements with the utility company, through the Engineer, and shall submit a schedule of work, verified by a representative of the utility company, to the Engineer. The schedule of work shall provide not less than the following number of working days, as defined in Section 8-1.06, "Time of Completion," of the Standard Specifications for the utility company to complete their work:

Utility (address)	Location	Working Days
Ione Irrigation Pipeline	44+86 Route 49	37
Water Line	30+20 to 36+60 Sutter Ione Road	24
Temporary Water Line Crossing	51+30 Route 49	17

In the event that the utility facilities mentioned above are not removed or relocated by the date of beginning construction and, if in the opinion of the Engineer, the Contractor's operations are delayed or interfered with by reason of the utility facilities not being removed or relocated by the date specified, the State will compensate the Contractor for the delays to the extent provided in Section 8-1.09, "Right of Way Delays," of the Standard Specifications, and not otherwise, except as provided in Section 8-1.10, "Utility and Non-Highway Facilities," of the Standard Specifications.

10-1.09 DUST CONTROL

Dust control shall conform to the provisions in Section 10, "Dust Control," of the Standard Specifications.

10-1.10 MOBILIZATION

Mobilization shall conform to the provisions in Section 11, "Mobilization," of the Standard Specifications.

10-1.11 CONSTRUCTION AREA TRAFFIC CONTROL DEVICES

Flagging, signs, and all other traffic control devices furnished, installed, maintained, and removed when no longer required shall conform to the provisions in Section 12, "Construction Area Traffic Control Devices," of the Standard Specifications and these special provisions.

Category 1 traffic control devices are defined as those devices that are small and lightweight (less than 45 kg), and have been in common use for many years. The devices shall be known to be crashworthy by crash testing, crash testing of similar devices, or years of demonstrable safe performance. Category 1 traffic control devices include traffic cones, plastic drums, portable delineators, and channelizers.

If requested by the Engineer, the Contractor shall provide written self-certification for crashworthiness of Category 1 traffic control devices. Self-certification shall be provided by the manufacturer or Contractor and shall include the following: date, Federal Aid number (if applicable), expenditure authorization, district, county, route and kilometer post of project limits; company name of certifying vendor, street address, city, state and zip code; printed name, signature and title of certifying person; and an indication of which Category 1 traffic control devices will be used on the project. The Contractor may obtain a standard form for self-certification from the Engineer.

Category 2 traffic control devices are defined as those items that are small and lightweight (less than 45 kg), that are not expected to produce significant vehicular velocity change, but may otherwise be potentially hazardous. Category 2 traffic control devices include: barricades and portable sign supports.

Category 2 devices purchased on or after October 1, 2000 shall be on the Federal Highway Administration (FHWA) Acceptable Crashworthy Category 2 Hardware for Work Zones list. This list is maintained by FHWA and can be located at the following internet address: http://safety.fhwa.dot.gov/fourthlevel/hardware/listing.cfm?code=workzone. The Department maintains a secondary list at the following internet address: http://www.dot.ca.gov/hq/traffops/signtech/signdel/pdf.htm.

Category 2 devices that have not received FHWA acceptance, and were purchased before October 1, 2000, may continue to be used until they complete their useful service life or until January 1, 2003, whichever comes first. Category 2 devices in use that have received FHWA acceptance shall be labeled with the FHWA acceptance letter number and the name of the manufacturer by the start of the project. The label shall be readable. After January 1, 2003, all Category 2 devices without a label shall not be used on the project.

If requested by the Engineer, the Contractor shall provide a written list of Category 2 devices to be used on the project at least 5 days prior to beginning any work using the devices. For each type of device, the list shall indicate the FHWA acceptance letter number and the name of the manufacturer.

Full compensation for providing self-certification for crashworthiness of Category 1 traffic control devices and for providing a list of Category 2 devices used on the project and labeling Category 2 devices as specified shall be considered as included in the prices paid for the various contract items of work requiring the use of the Category 1 or Category 2 traffic control devices and no additional compensation will be allowed therefor.

10-1.12 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 "Prequalified and Tested Signing and Delineation Materials" 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 "Prequalified and Tested Signing and Delineation Materials" of these special provisions.

The Contractor may be required to cover certain signs during the progress of the work. Signs that are no longer required or that convey inaccurate information to the public shall be immediately covered or removed, or the information shall be corrected. Covers for construction area signs shall be of sufficient size and density to completely block out the complete face of the signs. The retroreflective face of the covered signs shall not be visible either during the day or at night. Covers shall be fastened securely so that the signs remain covered during inclement weather. Covers shall be replaced when they no longer cover the signs properly.

10-1.13 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.

Under one-way traffic control, public traffic may be stopped for periods not to exceed 15 minutes. After each closure, all accumulated traffic shall be allowed to pass through the work before another closure is made.

At locations where falsework pavement lighting through falsework are designated, falsework lighting shall be installed in conformance with the provisions in Section 86-6.11, "Falsework Lighting," of the Standard Specifications.

Openings shall be provided through bridge falsework for the use of access traffic at each location where falsework is constructed over the access road listed in the following table. The type, minimum width, height, and number of openings at each location, and the location and maximum spacing of falsework lighting, if required for each opening, shall conform to the requirements in the table. The spacing shown for falsework pavement lighting is the maximum distance center to center in meters between fixtures.

At the following location, no temporary railing is required. In addition to the falsework pavement lighting specified, each side of each vehicular passageway between portals shall be illuminated by a string of yellow 25-W lamps spaced at 3.6 m intervals, mounted at a height of 2.4 to 2.6 meters above the pavement:

Sutter Creek Bridge
Br. No. 26-0040

	Number	Width	Height
Vehicle Openings Dirt Road	1	3.6	4.6
	Location	Spacing	
Falsework Pavement Lighting	R	7.0	

(Width and Height in meters)
(R = Right side of traffic. L = Left side of traffic)

The exact location of openings will be determined by the Engineer.

Personal vehicles of the Contractor's employees shall not be parked on the traveled way or shoulders including any section closed to public traffic.

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 with fluorescent traffic cones or portable delineators placed on a taper in advance of the parked vehicles or equipment and along the edge of the pavement at 7.5 m intervals to a point not less than 7.5 m past the last vehicle or piece of equipment. A minimum of 9 cones or portable delineators shall be used for the taper. A C23 (Road Work Ahead) or C24 (Shoulder Work Ahead) sign shall be mounted on a portable sign stand with flags. The sign shall be placed where designated by the Engineer.

Except as otherwise provided in these special provisions, 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.

No lane closures, shoulder closures, or other traffic restrictions will be allowed on the following day(s): Martin Luther King Day, Lincoln's Birthday, Cesar Chavez Day and Columbus Day.

The full width of the traveled way shall be open for use by public traffic on Saturdays, Sundays and designated legal holidays; after 3:00 p.m. on Fridays and the day preceding designated legal holidays; and when construction operations are not actively in progress.

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.

When designated legal holidays fall on Sunday, lanes shall be open for use by public traffic on the preceding Friday. When designated legal holidays fall on Saturday, lanes shall be open for use by public traffic on the following Monday.

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. Other modifications will be made by contract change order.

Chart No. 1
Multilane Lane Requirements

Location: Route 49 From Junction Route 104 to Bryson Drive

	a.m.												p.m.												
FROM HOUR TO HOUR	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Mondays through Thursdays	R	R	R	R	R	R	R	2	2	2	2										2	R	R	R	R
Fridays	R	R	R	R	R	R	R	2	2	2	2														
Saturdays																									
Sundays																						2	2	R	R
Day before and day after designated legal holiday																									
Designated legal holidays																									

Legend:

R	A minimum of one paved traffic lane, not less than 3.3 m wide, shall be open for use by public traffic. (Reversing Control).
2	A minimum of two paved traffic lanes shall be open for use by public traffic. (One lane not less than 3.3 m wide in each direction of travel).
	No lane closure allowed

REMARKS:

Chart No. 2
Two-Lane Conventional Highway Lane Requirements

Location: Route 49 from O'Neil Alley to 0.3 km south of Rancheria Creek

	a.m.												p.m.												
FROM HOUR TO HOUR	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Mondays through Thursdays	R	R	R	R	R	R	R														R	R	R	R	R
Fridays	R	R	R	R	R	R	R																		
Saturdays																									
Sundays																						R	R	R	R
Day before and day after designated legal holiday																									
Designated legal holidays																									

Legend:

R	A minimum of one paved traffic lane, not less than 3.3 m wide, shall be open for use by public traffic. (Reversing Control).
	No work that interferes with public traffic will be allowed

REMARKS:

Chart No. 3
Two-Lane Conventional Highway Lane Requirements

Location: Route 104 west of Route 49

	a.m.												p.m.												
FROM HOUR TO HOUR	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Mondays through Thursdays	R	R	R	R	R	R	R														R	R	R	R	
Fridays	R	R	R	R	R	R	R																		
Saturdays																									
Sundays																							R	R	
Day before and day after designated legal holiday																									
Designated legal holidays																									

Legend:

R	A minimum of one paved traffic lane, not less than 3.0 m wide, shall be open for use by public traffic. (Reversing Control).
	No work that interferes with public traffic will be allowed

REMARKS:

Chart No. 4
Two-Lane Conventional Highway Lane Requirements

Location: Ridge Road east of Route 49

	a.m.												p.m.												
FROM HOUR TO HOUR	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Mondays through Thursdays	R	R	R	R	R	R	R														R	R	R	R	
Fridays	R	R	R	R	R	R	R																		
Saturdays																									
Sundays																							R	R	
Day before and day after designated legal holiday																									
Designated legal holidays																									

Legend:

R	A minimum of one paved traffic lane, not less than 3.0 m wide, shall be open for use by public traffic. (Reversing Control).
	No work that interferes with public traffic will be allowed

REMARKS:

Chart No. 5
Two-Lane Conventional Highway Lane Requirements

Location: Valley View Drive west of Route 49

	a.m.												p.m.												
FROM HOUR TO HOUR	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Mondays through Thursdays	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
Fridays	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R										
Saturdays																									
Sundays																					R	R	R	R	R
Day before designated legal holiday																									
Designated legal holidays																									

Legend:

R	A minimum of one paved traffic lane, not less than 3.0 m wide, shall be open for use by public traffic. (Reversing Control).
	No work that interferes with public traffic will be allowed

REMARKS: May be detoured to Route 104 with signed detour and 7 day advance notice.

Chart No. 6
Two-Lane Conventional Highway Lane Requirements

Location: El Terrado, Bryson Drive, Allen Road, Sutter-Ione Road and Tonzi Road

	a.m.												p.m.												
FROM HOUR TO HOUR	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Mondays through Thursdays	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	
Fridays	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R										
Saturdays																									
Sundays																				R	R	R	R	R	
Day before designated legal holiday																									
Designated legal holidays																									

Legend:

R	A minimum of one paved traffic lane, not less than 3.0 m wide, shall be open for use by public traffic. (Reversing Control).
	No work that interferes with public traffic will be allowed

REMARKS:

10-1.14 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 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.

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.

10-1.15 CONSTRUCTION ZONE ENHANCED ENFORCEMENT

Construction zone enhanced enforcement will be provided by the State as directed by the Engineer and in conformance with these special provisions. Construction zone enhanced enforcement shall consist of the presence of the California Highway Patrol (CHP) within and near the limits of construction to control the movement of public traffic within the work zone.

The Contractor shall submit a schedule to the Engineer at least 15 days prior to the performance of work requiring construction zone enhanced enforcement. The schedule shall include all activities requiring construction zone enhanced enforcement and the estimated hours of CHP support required for each activity. The work shall be performed within the number of hours allocated for CHP support.

The Contractor may request additional CHP support for other times and in support of other work activities. The Contractor shall bear the costs and expenses for additional CHP support. The CHP shall be compensated at an agreed rate of $55 per hour per CHP Officer. The agreed rate shall be considered full compensation for each hour, or portion thereof, that a CHP Officer is performing construction area enhanced enforcement. There will be no markup applied to any expenses connected with CHP support. The costs and expenses for requested additional CHP support will be deducted from moneys due to the Contractor.

The Engineer will make all arrangements with the CHP for scheduled and requested additional construction zone enhanced enforcement.

CHP support shall be scheduled in compliance with the provisions in "Closure Requirements and Conditions" of these special provisions. The Contractor will be notified in writing of assigned CHP support when the Contractor is informed of the approval of requested closures.

Cancellations to previously approved closures scheduled to include construction zone enhancement enforcement shall be submitted in writing to the Engineer at least 36 hours prior to the time when the closure is to be in place. Written notices of cancellation for a closure shall be delivered to the Engineer between the hours of 7:00 a.m. and 3:00 p.m., Monday through Friday, excluding designated legal holidays.

Cancellations with less than the 36-hour written notice may result in charges from the CHP. The Contractor shall bear any costs and expenses resulting from cancellations with less than the 36 hour written notice, except cancellations due to weather or circumstances beyond the control of the Contractor, as determined by the Engineer. The CHP shall be compensated not less than $50.00 per hour and no greater than 4 hours of overtime pay per CHP Officer scheduled to participate in the construction zone enhancement enforcement that is cancelled. The costs and expenses incurred for late cancellations will be deducted from moneys due or that may become due the Contractor.

The presence of the California Highway Patrol will not relieve the Contractor of responsibility of providing for the safety of the public in conformance with the requirements in Section 7-1.09, "Public Safety," nor relieve the Contractor from the responsibility for damage in conformance with the requirements in Section 7-1.12, "Responsibility for Damage," of the Standard Specifications.

10-1.16 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.

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.

When traffic is under one-way control on unpaved areas, the cones shown along the centerline on the plans need not be placed.

Utilizing a pilot car will be at the option of the Contractor. If the Contractor elects to use a pilot car, the cones shown along the centerline on the plan need not be placed. The pilot car shall have radio contact with personnel in the work area. The maximum speed of the pilot car through the traffic control zone shall be 40 kilometers per hour (25 mph).

The contract lump sum price paid for traffic control system shall include full compensation for furnishing all labor (except for flagging costs), 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 and for furnishing and operating the pilot car, (including driver, radios, other equipment, and labor required), as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer. Flagging costs will be paid for as provided in Section 12-2.02, "Flagging Costs," of the Standard Specifications.

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.

10-1.17 TEMPORARY PAVEMENT DELINEATION

Temporary pavement delineation shall be furnished, placed, maintained, and removed in conformance with the provisions in Section 12-3.01, "General," of the Standard Specifications and these special provisions. Nothing in these special provisions shall be construed as reducing the minimum standards specified in the Manual of Traffic Controls published by the Department or as relieving the Contractor from his responsibility as provided in Section 7-1.09, "Public Safety," of the Standard Specifications.

GENERAL

Whenever the work causes obliteration of pavement delineation, temporary or permanent pavement delineation shall be in place prior to opening the traveled way to public traffic. Laneline or centerline pavement delineation shall be provided at all times for traveled ways open to public traffic.

Work necessary, including required lines or marks, to establish the alignment of temporary pavement delineation shall be performed by the Contractor. Surfaces to receive temporary pavement delineation shall be dry and free of dirt and loose material. Temporary pavement delineation shall not be applied over existing pavement delineation or other temporary pavement delineation. Temporary pavement delineation shall be maintained until superseded or replaced with a new pattern of temporary pavement delineation or permanent pavement delineation.

Temporary pavement markers and removable traffic tape which conflicts with a new traffic pattern or which is applied to the final layer of surfacing or existing pavement to remain in place shall be removed when no longer required for the direction of public traffic, as determined by the Engineer.

TEMPORARY LANELINE AND CENTERLINE DELINEATION

Whenever lanelines and centerlines are obliterated, the minimum laneline and centerline delineation to be provided shall be temporary raised pavement markers placed at longitudinal intervals of not more than 7.3 m. The temporary raised pavement markers shall be the same color as the laneline or centerline the markers replace. Temporary raised pavement markers shall be, at the option of the Contractor, one of the temporary pavement markers listed for short term day/night use

(14 days or less) or long term day/night use (6 months or less) in "Prequalified and Tested Signing and Delineation Materials" of these special provisions.

Temporary raised pavement markers shall be placed in conformance with the manufacturer's instructions and shall be cemented to the surfacing with the adhesive recommended by the manufacturer, except epoxy adhesive shall not be used to place pavement markers in areas where removal of the markers will be required.

Temporary laneline or centerline delineation consisting entirely of temporary raised pavement markers placed on longitudinal intervals of not more than 7.3 m shall be used on lanes open to public traffic for a maximum of 14 days. Prior to the end of the 14 days, the permanent pavement delineation shall be placed. If the permanent pavement delineation is not placed within the 14 days, additional temporary pavement delineation shall be provided at the Contractor's expense. The additional temporary pavement delineation to be provided shall be equivalent to the pattern specified for the permanent pavement delineation for the area, as determined by the Engineer.

Where "no passing" centerline pavement delineation is obliterated, the following "no passing" zone signing shall be installed prior to opening the lanes to public traffic. C18 (ROAD CONSTRUCTION AHEAD) or C23 (ROAD WORK AHEAD) signs shall be installed from 300 m to 600 m ahead of "no passing" zones. R63 (DO NOT PASS) signs shall be installed at the beginning and at every 600-m interval within "no passing" zones. For continuous zones longer than 3 km, W71 (NEXT _____ MILES) signs shall be installed beneath the C18 or C23 signs installed ahead of "no passing" zones. R64 (PASS WITH CARE) signs shall be installed at the end of "no passing" zones. The exact location of "no passing" zone signing will be as determined by the Engineer and shall be maintained in place until permanent "no passing" centerline pavement delineation has been applied. The signing for "no passing" zones shall be removed when no longer required for the direction of public traffic. The signing for "no passing" zones shall conform to the provisions in "Construction Area Signs" of these special provisions, except for payment.

Full compensation for furnishing, placing, maintaining, and removing the temporary raised pavement markers used for temporary laneline and centerline delineation (including the signing specified for "no passing" zones)–and for providing equivalent patterns of permanent traffic lines for these areas when required shall be considered as included in the contract prices paid for the items of work that obliterated the laneline and centerline pavement delineation and no separate payment will be made therefor.

10-1.18 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.

A portable changeable message sign shall be placed 7 calendar days in advance of the lane closure (one for each lane closure system).

For one-way reversing lane closures, a portable changeable message sign shall be placed for each direction. The exact locations will be designated by the Engineer.

The contract lump sum price paid for portable changeable message sign shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in furnishing, placing, operating, maintaining, repairing, replacing, transporting from location to location, and removing the portable changeable message signs, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

10-1.19 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.

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.

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 and Fitch 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 (North): Traffic Control Service, Inc., 8585 Thys Court, Sacramento, CA 95828. Telephone 1-800-884-8274, FAX 1-916-387-9734
   2. Distributor (South): Traffic Control Service, Inc., 1881 Betmor Lane, Anaheim, CA 92805. Telephone 1-800-222-8274, FAX 1-714-937-1070

B. 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. Distributor (North): United Rentals, Inc., 1533 Berger Drive, San Jose, CA 95112. Telephone 1-408 287-4303, FAX 1-408 287-1929
   2. Distributor (South): Statewide Safety & Sign, Inc., 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.

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.

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

10-1.20 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.

ABANDON CULVERT

Existing culverts , where shown on the plans to be abandoned, shall be abandoned in place or, at the option of the Contractor, the culverts shall be removed and disposed of. Resulting openings into existing structures that are to remain in place shall be plugged with commercial quality concrete containing not less than 300 kg of cement per cubic meter.

Abandoning culverts in place shall conform to the following:

A. Culverts that intersect the side slopes shall be removed to a depth of not less than one meter measured normal to the plane of the finished side slope, before being abandoned.
B. Culverts 300 mm in diameter and larger, shall, at the Contractor's option, be backfilled with either sand, controlled low strength material or slurry cement backfill conforming to the provisions in Section 19-3.062, "Slurry Cement

Backfill," of the Standard Specifications by any method acceptable to the Engineer that completely fills the pipe. Sand backfill material shall be clean, free draining, and free from roots and other deleterious substances.

C. The ends of culverts shall be securely closed by a 150 mm thick tight fitting plug or wall of commercial quality concrete.

Culverts shall not be abandoned until their use is no longer required. The Contractor shall notify the Engineer in advance of any intended culvertabandonment.

If the Contractor elects to remove and dispose of a culvert or pipeline which is specified to be abandoned, as provided herein, backfill specified for the pipe will be measured and paid for in the same manner as if the culvert or pipeline has been abandoned in place.

Backfill will be measured by the cubic meter determined from the dimensions of the culverts and pipelines to be abandoned.

The contract price paid per cubic meter for sand backfill shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in backfilling culverts and pipelines with sand, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Controlled low strength material and slurry cement backfill, if used at the Contractor's option, will be measured and paid for by the cubic meter as sand backfill.

Full compensation for concrete plugs, pipe removal, structure excavation, and backfill shall be considered as included in the contract price paid per meter for abandon culvert and no additional compensation will be allowed therefor.

REMOVE PAVEMENT MARKING

Pavement marking shall be removed at the locations shown on the plans and as directed by the Engineer.

Attention is directed to "Water Pollution Control" of these special provisions.

REMOVE DRAINAGE FACILITY

Existing inlets where shown on the plans to be removed, shall be completely removed and disposed of.

REMOVE ROADSIDE SIGN

Existing roadside signs, at those locations shown on the plans to be removed, shall be removed and disposed of.

Existing roadside signs shall not be removed until replacement signs have been installed or until the existing signs are no longer required for the direction of public traffic, unless otherwise directed by the Engineer.

REMOVE FLARED END SECTION

Existing flared end sections, at those locations shown on the plans to be removed, shall be removed and disposed of.

REMOVE PIPE

Existing abandoned pipe lines, where shown on the plans to be removed, shall be removed and disposed of.

Attention is directed to "Order of Work," of these special provisions regarding contacting the utility owners of abandoned underground facilities and presenting certification to the Engineer that the abandoned utility facilities are free of combustible/hazardous materials prior to excavation or removal of underground pipes.

SALVAGE ROCK WALL

Existing rock walls, where shown on the plans to be salvaged, shall be demolished, hauled and stockpiled at a location between Station 82+20 and 84+40, left of Route 49, as directed by the Engineer.

Quantities of salvage rock wall will be measured in the vehicle by the cubic meter in conformance with the provisions in Section 9-1.01, "Measurement of Quantities," of the Standard Specifications.

Full compensation for removing, salvaging, hauling, and stockpiling the rocks shall be considered as included in the contract price paid per cubic meter for salvage rock wall and no separate payment will be made therefor.

RECONSTRUCT METAL BEAM GUARD RAILING

Existing metal beam guard railing, where shown on the plans to be reconstructed, shall be reconstructed.

Attention is directed to "Order of Work" of these special provisions regarding the reconstruction of metal beam guard railing at those locations exposed to public traffic.

Cable anchor assemblies or terminal anchor assemblies, including concrete anchors and steel foundation tubes, shall be completely removed and disposed of.

New posts, blocks, and hardware shall be furnished and used to reconstruct metal beam guard railing. New posts and blocks shall conform to the provisions in Section 83-1.02B, "Metal Beam Guard Railing," of the Standard Specifications.

Posts, blocks, and other components of the removed metal beam guard railing, including terminal sections, that are not used in the reconstruction work shall be disposed of.

Full compensation for furnishing and installing new posts, blocks, and hardware; for connecting reconstructed metal beam guard railing to existing structures, or terminal systems; and for removing and disposing of anchor assemblies shall be considered as included in the contract price paid per meter for reconstruct metal beam guard railing and no separate payment will be made therefor.

Terminal System (Type SRT) for connection to reconstructed metal beam guard railing will be measured and paid for separately in conformance with the provisions in "Terminal System (Type SRT)" of these special provisions.

RESET ROADSIDE SIGN

Existing roadside signs, where shown on the plans to be reset, shall be removed and reset.

Each roadside sign shall be reset on the same day that the sign is removed.

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

REMOVE BASE AND SURFACING

Existing base and bituminous surfacing shown on the plans to be removed, shall be removed to a depth of at least 150 mm below the grade of the existing surfacing. Resulting holes and depressions shall be backfilled with earthy material selected from excavation to the lines and grade established by the Engineer.

Removing base and surfacing will be measured and paid for as roadway excavation.

REMOVE FENCE

Existing fence, where shown on the plans to be removed, shall be removed and disposed of.

Existing concrete anchors shall be completely removed and disposed of. Full compensation for removing concrete anchors shall be considered as included in the contract price paid per meter for remove fence and no separate payment will be made therefor.

COLD PLANE ASPHALT CONCRETE PAVEMENT

Existing asphalt concrete pavement shall be cold planed at the locations and to the dimensions shown on the plans.

Planing asphalt concrete pavement shall be performed by the cold planing method. Planing of the asphalt concrete pavement shall not be done by the heater planing method.

Cold planing machines shall be equipped with a cutter head not less than 750 mm in width and shall be operated so that no fumes or smoke will be produced. The cold planing machine shall plane the pavement without requiring the use of a heating device to soften the pavement during or prior to the planing operation.

The depth, width, and shape of the cut shall be as shown on the plans or as designated by the Engineer. The final cut shall result in a uniform surface conforming to the plans. The outside lines of the planed area shall be neat and uniform. Planing asphalt concrete pavement operations shall be performed without damage to the surfacing to remain in place.

Planed widths of pavement shall be continuous except for intersections at cross streets where the planing shall be carried around the corners and through the conform lines. Following planing operations, a drop-off of more than 45 mm will not be allowed between adjacent lanes open to public traffic.

Where transverse joints are planed in the pavement at conform lines no drop-off shall remain between the existing pavement and the planed area when the pavement is opened to public traffic. If asphalt concrete has not been placed to the level of existing pavement before the pavement is to be opened to public traffic a temporary asphalt concrete taper shall be constructed. Asphalt concrete for temporary tapers shall be placed to the level of the existing pavement and tapered on a slope of 1:30 (Vertical: Horizontal) or flatter to the level of the planed area.

Asphalt concrete for temporary tapers shall be commercial quality and may be spread and compacted by any method that will produce a smooth riding surface. Temporary asphalt concrete tapers shall be completely removed, including the removal of loose material from the underlying surface, before placing the permanent surfacing. The removed material shall be disposed of 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.

Operations shall be scheduled so that not more than 7 days shall elapse between the time when transverse joints are planed in the pavement at the conform lines and the permanent surfacing is placed at the conform lines.

The material planed from the roadway surface, including material deposited in existing gutters or on the adjacent traveled way, shall be disposed of in conformance with the provisions in Section 7-1.13, "Disposal of Material Outside the

Highway Right of Way," of the Standard Specifications. Removal operations of cold planed material shall be concurrent with planing operations and follow within 15 m of the planer, unless otherwise directed by the Engineer.

Cold plane asphalt concrete pavement will be measured by the square meter. The quantity to be paid for will be the actual area of surface cold planed irrespective of the number of passes required to obtain the depth shown on the plans.

The contract price paid per square meter for cold plane asphalt concrete pavement shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in cold planing asphalt concrete surfacing and disposing of planed material, including furnishing the asphalt concrete for and constructing, maintaining, removing, and disposing of temporary asphalt concrete tapers, as specified in the Standard Specifications and these special provisions and as directed by the Engineer.

REMOVE CONCRETE

Concrete, where shown on the plans to be removed, shall be removed.

The pay quantities of concrete to be removed will be measured by the cubic meter, measured before and during removal operations.

Concrete within construction limits, both inside and outside the highway right of way, shall be removed, except for curbs and sidewalks adjacent to city streets.

Where no joint exists between concrete to be removed and concrete to remain in place, the concrete shall be cut on a neat line to a minimum depth of 50 mm with a power driven saw before the concrete is removed.

Where concrete has been removed outside the roadway prism, the backfilled areas shall be graded to drain and blend in with the surrounding terrain.

Concrete to be removed which has portions of the same structure both above and below ground will be considered as concrete above ground for compensation.

10-1.21 CLEARING AND GRUBBING

Clearing and grubbing shall conform to the provisions in Section 16, "Clearing and Grubbing," of the Standard Specifications and these special provisions.

Vegetation shall be cleared and grubbed only within the excavation and embankment slope lines.

Existing vegetation outside the areas to be cleared and grubbed shall be protected from injury or damage resulting from the Contractor's operations.

Activities controlled by the Contractor, except cleanup or other required work, shall be confined within the graded areas of the roadway.

Nothing herein shall be construed as relieving the Contractor of the Contractor's responsibility for final cleanup of the highway as provided in Section 4-1.02, "Final Cleaning Up," of the Standard Specifications.

Vegetable growth from clearing and grubbing operations may be disposed of in embankments in conformance with the provisions in "Earthwork" of these special provisions.

Improvements remaining either wholly or partially within the highway right of way, including, but not limited to, sheds, stables, buildings, foundations, pools, concrete water trough approximately seventeen meters left of station 36+43 of Route 49 and slabs above ground, shall be demolished and removed as part of the work included under clearing and grubbing.

The State reserves the right to salvage materials from the improvements prior to the date set for opening of bids.

The general locations of these improvements are as follows:

A. 55 meters Left Station 28+00± Route 49 to 40 meters Right Station 28+40± Route 49.

The Contractor shall not dispose of the improvements or materials there from by sale, gift or in any manner whatsoever to the general public at the site, provided however, that this provision shall not be construed as limiting or prohibiting the sale or disposal of the improvements or materials at the site to duly licensed contractors or material vendors, and provided that the materials are removed from the improvement by the State's Contractor. Removal of buildings as a unit, or in sections capable of reassembly as a structure, is expressly prohibited.

Full compensation for demolition, removal, and disposal of the facilities specified herein shall be considered as included in the contract lump sum price paid for clearing and grubbing and no additional compensation will be allowed therefor.

10-1.22 WATERING

Developing a water supply and applying watering shall conform to the provisions in Section 17, "Watering," of the Standard Specifications and these special provisions.

Attention is directed to the source or sources of water for use on the project specified in the "Materials Information" handout available to the contractors.

10-1.23 EARTHWORK

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

Attention is directed to "Material Containing Arsenic" of these special provisions.

The grading plane of embankments beneath structure approach slabs and beneath the thickened portion of sleeper slabs shall not project above the grade established by the Engineer.

Surplus excavated material not designated or determined to contain arsenic shall become the property of the Contractor and shall be disposed of in conformance with the provisions in Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications.

Where a portion of the existing surfacing is to be removed, the outline of the area to be removed shall be cut on a neat line with a power-driven saw to a minimum depth of 50 mm before removing the surfacing. Full compensation for cutting the existing surfacing shall be considered as included in the contract price paid per cubic meter for roadway excavation and no additional compensation will be allowed therefor.

Reinforcement or metal attached to reinforced concrete rubble placed in embankments shall not protrude above the grading plane. Prior to placement within 0.6-m below the grading plane of embankments, reinforcement or metal shall be trimmed to no greater than 20 mm from the face of reinforced concrete rubble. Full compensation for trimming reinforcement or metal shall be considered as included in the contract prices paid per cubic meter for the types of excavation shown in the Engineer's estimate, or the contract prices paid for furnishing and placing imported borrow or embankment material, as the case may be, and no additional compensation will be allowed therefor.

The "0.2-m" dimensions in the fifth paragraph of Section 19-3.08, "Payment," of the Standard Specifications are increased to "0.3-m" on this project.

At the option of the Contractor, vegetable growth may be disposed of in embankment areas by either Method I or Method II.

A. METHOD I

1. Buried vegetable growth shall be placed outside of the 1:1 inclined plane sloping out and down from the outside edge of the shoulder of the planned roadbed, but not within 1.5 m of the finished slope line, measured normal to the slope.
2. Brush and debris shall be mixed with not less than 50 percent earth and placed in uniform layers.
3. No material shall be disposed of where the material will interfere with planned work.

B. METHOD II

1. Buried vegetable growth shall be placed at least 4.5 m beneath the grading plane, at least 3 m from the surface of any embankment slope, and at least 2.0 m horizontally from and not beneath any planned structures, including but not limited to: abutments, walls, footings, foundations, piles, drainage structures and utility installations.
2. Brush, grass, weeds, slash, and limbs or logs under 100 mm in diameter shall be chipped and placed on the completed embankment slopes and mixed with the underlying earth to such extent that the vegetable growth will not support combustion.

Full compensation for disposing of vegetable growth in embankment areas shall be considered as included in the contract lump sum price paid for clearing and grubbing and no additional compensation will be allowed therefor.

Settlement periods of 30 days are required for the bridge approach embankments.

The duration of the required settlement period at each location will be determined by the Engineer and will not exceed the number of days listed in the tables of settlement data.

Previous backfill material within the limits of payment for retaining walls will be measured and payed for by the cubic meter as structural backfill (retaining wall).

If structure excavation or structure backfill involved in bridges is not otherwise designated by type, and payment for the structure excavation or structure backfill has not otherwise been provided for in the Standard Specifications or these special provisions, the structure excavation or structure backfill will be paid for at the contract price per cubic meter for structure excavation (bridge) or structure backfill (bridge).

10-1.24 CONTROLLED LOW STRENGTH MATERIAL

Controlled low strength material shall consist of a workable mixture of aggregate, cementitious materials, and water and shall conform to the provisions for slurry cement backfill in Section 19-3.062, "Slurry Cement Backfill," of the Standard Specifications and these special provisions.

At the option of the Contractor, controlled low strength material may be used as structure backfill for pipe culverts, except that controlled low strength material shall not be used as structure backfill for aluminum and aluminum-coated culverts nor for culverts having a diameter or span greater than 6.1 m.

When controlled low strength material is used for structure backfill, the width of the excavation shown on the plans may be reduced so that the clear distance between the outside of the pipe and the side of the excavation, on each side of the pipe, is a minimum of 300 mm. This minimum may be reduced to 150 mm when the height of cover is less than or equal to 6.1 m or the pipe diameter or span is less than 1050 mm.

Controlled low strength material in new construction shall not be permanently placed higher than the basement soil. For trenches in existing pavements, permanent placement shall be no higher than the bottom of the existing pavement permeable drainage layer. If a drainage layer does not exist, permanent placement in existing pavements shall be no higher than 25 mm below the bottom of the existing asphalt concrete surfacing or no higher than the top of base below the existing portland cement concrete pavement. The minimum height that controlled low strength material shall be placed, relative to the culvert invert, is 0.5 diameter or 0.5 height for rigid culverts and 0.7 diameter or 0.7 height for flexible culverts.

When controlled low strength material is proposed for use, the Contractor shall submit a mix design and test data to the Engineer for approval prior to excavating the trench for which controlled low strength material is proposed for use. The test data and mix design shall provide for the following:

A. A 28-day compressive strength between 345 kPa and 690 kPa for pipe culverts having a height of cover of 6.1 m or less and a minimum 28-day compressive strength of 690 kPa for pipe culverts having a height of cover greater than 6.1 m. Compressive strength shall be determined in conformance with the requirements in ASTM Designation: D 4832.
B. When controlled low strength material is used as structure backfill for pipe culverts, the sections of pipe culvert in contact with the controlled low strength material shall conform to the requirements of Chapter 850 of the Highway Design Manual using the minimum resistivity, pH, chloride content, and sulfate content of the hardened controlled low strength material. Minimum resistivity and pH shall be determined in conformance with the requirements of California Test 643. The chloride content shall be determined in conformance with the requirements of California Test 422 and the sulfate content shall be determined in conformance with the requirements of California Test 417.
C. Cement shall be any type of portland cement conforming to the requirements in ASTM Designation: C 150; or any type of blended hydraulic cement conforming to the requirements in ASTM Designation: C 595M or the physical requirements in ASTM Designation: C 1157M. Testing of cement will not be required.
D. Admixtures may be used in conformance with the provisions in Section 90-4, "Admixtures," of the Standard Specifications. Chemical admixtures containing chlorides as Cl in excess of one percent by mass of admixture, as determined in conformance with the requirements of California Test 415, shall not be used. If an air-entraining admixture is used, the maximum air content shall be limited to 20 percent. Mineral admixtures shall be used at the Contractor's option.

Materials for controlled low strength material shall be thoroughly machine-mixed in a pugmill, rotary drum or other approved mixer. Mixing shall continue until the cementitious material and water are thoroughly dispersed throughout the material. Controlled low strength material shall be placed in the work within 3 hours after introduction of the cement to the aggregates.

When controlled low strength material is to be placed within the traveled way or otherwise to be covered by paving or embankment materials, the material shall achieve a maximum indentation diameter of 76 mm prior to covering and opening to public traffic. Penetration resistance shall be measured in conformance with the requirements in ASTM Designation: D 6024.

Controlled low strength material used as structure backfill for pipe culverts will be considered structure backfill for compensation purposes.

10-1.25 MATERIAL CONTAINING ARSENIC

Earthwork involving materials containing arsenic shown on the plans as roadway excavation (type r) (hazardous and restricted material) shall conform to the provisions in "Earthwork" and this section "Material Containing Arsenic" of these special provisions.

Attention is directed to "Hazardous and Restricted Material" of these special provisions.

Arsenic has been found in soils throughout the project's construction limits. Levels of Arsenic found within project limits range from 11.0 to 240.0 mg/kg total arsenic with 105.6 mg/kg total arsenic at the 90% Upper Confidence Limit, as analyzed by EPA Test Method 6010.

After the Contractor has completed handling materials containing arsenic, 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 arsenic shall be in conformance with rules and regulations including, but not limited to, the following agencies:

California Division of Occupational Safety and Health Administration (Cal-OSHA)
California Regional Water Quality Control Board, Region 5.

Full compensation for conforming to the requirements of this section, except for the Arsenic Compliance Plan, shall be considered as included in the price paid per cubic meter for roadway excavation (type R) (hazardous and restricted material) and no additional compensation will be allowed therefore.

ARSENIC COMPLIANCE PLAN

The Contractor shall prepare a project specific Arsenic Compliance Plan to prevent or minimize worker exposure to arsenic while handling material containing arsenic. Attention is directed to Title 8, California Code of Regulations, Section 1532.1, "Lead," for specific Cal-OSHA requirements when working with arsenic.

The Arsenic Compliance Plan shall contain the elements listed in Title 8, California Code of Regulations, Group 16, Article 107. Before submission to the Engineer, the Arsenic 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 for review and acceptance at least 7 days prior to beginning work in areas containing arsenic.

The Contractor shall not work in areas containing arsenic within the project limits, unless authorized in writing by the Engineer, until the Engineer has accepted the arsenic Compliance Plan.

Prior to performing work in areas containing arsenic, personnel who have no prior training or are not current in their training status, including State personnel, shall complete a safety training program provided by the Contractor. The safety training program shall meet the requirements of Title 8, California Code of Regulations, Group 16, Article 107 and the Contractor's Arsenic Compliance Program.

Personal protective equipment, training, and washing facilities required by the Contractor's Arsenic Compliance Plan shall be supplied to State personnel by the Contractor. The number of State personnel will be 4.

The Engineer will notify the Contractor of acceptance or rejection of any submitted or revised Arsenic Compliance Plan not more than 10 days after submittal of the plan.

Full compensation for preparing Arsenic Compliance Plan, including (furnishing all labor, materials, tools, equipment, and incidentals and for doing all the work involved in preparing the Arsenic 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), shall be considered as included in the contract lump sum price paid for site health and safety plan and no separate will be made therefor.

EXCAVATION AND TRANSPORTATION PLAN

Within 15 days after approval of the contract, the Contractor shall submit 3 copies of the Excavation and Transportation Plan to the Engineer. The Engineer will have 15 days to review the Excavation and Transportation Plan. If revisions are required, as determined by the Engineer, the Contractor shall revise and resubmit the Excavation and Transportation Plan within 7 days of receipt of the Engineer's comments. The Engineer will have 7 days to review the revisions. Upon the Engineer's approval of the Excavation and Transportation Plan, 3 additional copies of the Excavation and Transportation Plan 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 Excavation and Transportation Plan. In order to allow construction to proceed, the Engineer may conditionally approve the Excavation and Transportation Plan while minor revisions or amendments to the Plan are being completed.

The Contractor shall prepare a written, project specific Excavation and Transportation Plan establishing the procedures the Contractor will use to comply with requirements for excavating, transporting, and placing (or disposing) of material containing arsenic to a Class II landfill. The Excavation and Transportation Plan shall conform to the regulations of the Department of Toxic Substance Control and the California Division of Occupational Safety and Health Administration (Cal-OSHA). The sampling and analysis plans shall meet the requirements for the design and development of the sampling plan, statistical analysis, and reporting of test results contained in USEPA, SW 846, "Test Methods for Evaluating Solid Waste,"

Volume II: Field Manual Physical/Chemical, Chapter Nine, Section 9.1. The plan shall contain, but not be limited to the following elements:

A. Excavation schedule (by location and date)
B. Temporary locations of stockpiled material
C. Sampling and analysis plans for areas after removal of a stockpile
   1. Location and number of samples
   2. Analytical laboratory
D. Sampling and analysis plan for soil cover
E. Sampling and analysis plan for post excavation from Route 49, Station 28+87 to Station 32+63 as shown on the plans.
F. Dust control measures
G. Air monitoring
   1. Location and type of equipment
   2. Sampling frequency
   3. Analytical laboratory
H. Transportation equipment and routes
I. Method for preventing spills and tracking material onto public roads
J. Truck waiting and staging areas
K. Site for Class II disposal of arsenic contaminated soils that exceed the USEPA Preliminary Remediation Goals for arsenic
L. Example of Bill of Lading to be carried by trucks transporting arsenic contaminated soils. The Bill of Lading shall contain: US DOT description including shipping name, hazard class, and ID number; handling codes; quantity of material; volume of material. Copies of the bills of lading shall be provided to the Engineer upon placement of arsenic contaminated soils that exceed the USEPA Preliminary Remediation Goals for arsenic in its final location. Trucks carrying arsenic contaminated soils that exceed the USEPA Preliminary Remediation Goals for arsenic shall not leave the highway right of way.
M. Spill Contingency Plan for material containing arsenic

DUST CONTROL

Excavation, transportation, placement, and handling of materials containing arsenic shall result in no visible dust migration. The Contractor shall have a water truck or tank on the job site at all times while clearing and grubbing and performing earthwork operations in work areas containing arsenic.

Stockpiles of material containing arsenic shall not be placed where affected by surface run-on or run-off. Stockpiles shall be covered with plastic sheeting 0.33 mm minimum thickness or 0.3 m of non-hazardous material. Stockpiles shall not be placed in environmentally sensitive areas. Stockpiled material shall not enter storm drains, inlets, or waters of the State.

MATERIAL TRANSPORTATION

Prior to traveling on public roads, loose and extraneous material shall be removed from surfaces outside the cargo areas of the transporting vehicles and the cargo shall be covered with tarpaulins, or other cover, as outlined in the approved Excavation and Transportation Plan. The Contractor shall be responsible for costs due to spillage of material containing arsenic during transport. The Department will not consider the Contractor a generator of these hazardous materials, and the Contractor will not be obligated for further cleanup, removal, or remedial action for such materials handled or disposed of in conformance with the requirements specified in these special provisions and the appropriate State and Federal laws and regulations and county and municipal ordinances and regulations regarding hazardous waste.

DISPOSAL

Surplus materials whose arsenic content is not known shall be analyzed for arsenic by the Contractor prior to removing the materials from within the project limits. The Contractor shall submit a sampling and analysis plan and the name of the analytical laboratory to the Engineer at least 15 days prior to beginning sampling or analysis. The Contractor shall use a laboratory certified by the California Department of Health Services. Sampling shall be at a minimum rate of one sample for each 150 m^3 of surplus material and tested for arsenic using EPA Method 6010 or 7000 series.

Sampling, analyses, and reporting of results for surplus materials not previously sampled will be paid for as extra work as provided in Section 4-1.03D, "Extra Work," of the Standard Specifications.

Materials containing arsenic shall be disposed of within California. The disposal site shall be operating under a permit issued by the California Environmental Protection Agency (Cal-EPA) Boards.

The Engineer will obtain the State of California Board of Equalization Identification Number for hazardous material disposal. The Engineer will sign all hazardous waste manifests. The Contractor shall notify the Engineer five days before the manifests are to be signed.

Sampling, analyzing, transporting, and disposing of materials containing arsenic excavated outside the pay limits of excavation will be at the Contractor's expense.

MEASUREMENT AND PAYMENT

Quantities of roadway excavation (Type R) (hazardous and restricted material), shown in the Engineer's Estimate, will be measured in the same manner specified for roadway excavation in Section 19, "Earthwork," of the Standard Specifications.

Full compensation for preparing an approved Excavation and Transportation Plan and transporting and disposing of material containing arsenic shall be considered as included in the contract prices paid per cubic meter for roadway excavation (Type R) (hazardous and restricted material) and no additional compensation will be allowed therefor.

No payment for stockpiling of material containing arsenic will be made, unless the stockpiling is ordered by the Engineer.

10-1.26 DUFF

This work shall consist of excavating, stockpiling, removing from stockpiles, spreading, and compacting duff in conformance with these special provisions.

Duff shall consist of a mixture of existing decomposed, chopped, broken or chipped plant material, leaves, grasses, weeds, and other plant material excavated from areas within the project limits. Existing shrubs and other small plants shall be incorporated into the duff by discing, or by other methods which will break or chop the material into particles not greater than 150 mm in greatest dimension.

When duff is to be excavated to a specified depth, duff may consist of plant material and soil. Rocks and plant material in excess of 150 mm in greatest dimension shall be removed from the excavated duff.

Trash and objectionable material shall be removed from duff excavation sites prior to duff excavation. The trash and objectionable material shall be removed and disposed of outside the highway right of way in conformance with the provisions in Section 7-l.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications.

Duff shall be obtained by excavating the top 100 mm of existing material from areas within the project limits. Duff shall be stockpiled along the top of proposed excavation slopes and along the toe of proposed embankment slopes. When duff cannot be stockpiled outside the slope lines as specified herein, excavated duff material may be stockpiled at other locations when designated by the Engineer.

Upon completion of the grading operations , the duff shall be spread on the areas designated to receive duff. Duff shall be placed to a uniform depth of not less than 50 mm and shall be compacted or stabilized in a manner that retains the material in place on the slopes. Duff shall not be compacted or stabilized to the degree that the duff is not maintained as a viable growing medium.

Duff shall be placed prior to applying erosion control materials. Erosion control materials shall be furnished and applied as specified in these special provisions.

Duff placed on the finished slopes will be measured by the square meter. The areas of duff will be calculated on the basis of actual or computed slope measurements.

The contract price paid per square meter for duff shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in excavating, stockpiling, removing duff from stockpiles, spreading and compacting or stabilizing duff, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

10-1.27 MOVE-IN/MOVE-OUT (EROSION CONTROL)

Move-in/move-out (erosion control) shall include moving onto the project when an area is ready to receive erosion control as determined by the Engineer, setting up all required personnel and equipment for the application of erosion control materials and moving out all personnel and equipment when erosion control in that area is completed.

When areas are ready to receive applications of erosion control (Types C or D) or erosion control blanket (Type 1), as determined by the Engineer, the Contractor shall begin erosion control work in that area within 5 working days of the Engineer's notification to perform the erosion control work.

Attention is directed to the requirements of erosion control (Types C or D) and erosion control blanket (Type 1) elsewhere in these special provisions.

Quantities of move-in/move-out (erosion control) will be determined as units from actual count as determined by the Engineer. For measurement purposes, a move-in followed by a move-out will be considered as one unit.

The contract unit price paid for move-in/move-out (erosion control) shall include full compensation for furnishing all labor, materials (excluding erosion control materials), tools, equipment, and incidentals and for doing all the work involved in moving in and removing from the project all personnel and equipment necessary for application of erosion control (Types C or D) and erosion control blanket (Type 1), as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

No adjustment of compensation will be made for any increase or decrease in the quantities of move-in/move-out (erosion control) required, regardless of the reason for the increase or decrease. The provisions in Section 4-1.03B, "Increased or Decreased Quantities," of the Standard Specifications shall not apply to the item of move-in/move-out (erosion control).

10-1.28 EROSION CONTROL (TYPE C)

Erosion control (Type C) shall conform to the provisions in Section 20-3, "Erosion Control," of the Standard Specifications and these special provisions and shall consist of incorporating straw and applying other erosion control materials to embankment slopes that are 1:4 (vertical:horizontal) or steeper and more than 4 meters in length.

Erosion control (Type C) shall be applied when an area is ready to receive erosion control as determined by the Engineer and in conformance with the provisions in "Move-in/Move-out (Erosion Control)" of these special provisions.

Prior to installing erosion control materials, soil surface preparation shall conform to the provisions in Section 19-2.05, "Slopes," of the Standard Specifications, except that rills and gullies exceeding 50 mm in depth or width shall be leveled. Vegetative growth, temporary erosion control materials, and other debris shall be removed from areas to receive erosion control.

MATERIALS

Materials shall conform to the provisions in Section 20-2, "Materials," of the Standard Specifications and these special provisions.

Seed

Seed shall conform to the provisions in Section 20-2.10, "Seed," of the Standard Specifications. Individual seed species shall be measured and mixed in the presence of the Engineer.

Seed shall be delivered to the job site in unopened separate containers with the seed tag attached. Containers without a seed tag attached will not be accepted.

A sample of approximately 30 g of seed will be taken from each seed container by the Engineer.

Legume Seed

Legume seed shall be pellet-inoculated or industrial-inoculated and shall conform to the following:

A. Inoculated seed shall be inoculated in conformance with the provisions in Section 20-2.10, "Seed," of the Standard Specifications.
B. Inoculated seed shall have a calcium carbonate coating.
C. Industrial-inoculated seed shall be inoculated with Rhizobia and coated using an industrial process by a manufacturer whose principal business is seed coating and seed inoculation.
D. Industrial-inoculated seed shall be sown within 180 calendar days after inoculation.
E. Legume seed shall consist of the following:

LEGUME SEED

Botanical Name (Common Name)	Percent Germination (Minimum)	Kilograms Pure Live Seed Per Hectare (Slope Measurement)
Lotus Purshianus (Purshing Lotus)	50	3.0
Lupinus Bi-color (Pigmy Leafed Lupine)	50	2.0

Non-Legume Seed

Non-legume seed shall consist of the following:

NON-LEGUME SEED

Botanical Name (Common Name)	Percent Germination (Minimum)	Kilograms Pure Live Seed Per Hectare (Slope Measurement)
Bromus Carinatus (California Brome)	50	5.0
Elymus Glaucus "Anderson" (Anderson Blue Wildrye)	50	2.5
Leymus Triticoides (Creeping Wildrye)	50	2.0
Nassella Pulchra (Purple Needlegrass)	50	3.5
Eschscholzia Californica (California Poppy)	50	1.0
Vulpia Microstachya (Three Week Fescue)	50	2.5

Commercial Fertilizer

Commercial fertilizer shall conform to the provisions in Section 20-2.02, "Commercial Fertilizer," of the Standard Specifications.

Straw

Straw shall be derived from any of the plant species that are listed on the seed list. Straw shall be free of plastic, glass, metal, rocks, and refuse or other deleterious material.

Compost

Compost shall be derived from green material consisting of chipped, shredded or ground vegetation or clean processed recycled wood products or Class A, exceptional quality biosolids composts, as required by the United States Environmental Protection Agency (EPA), 40 CFR, Part 503c regulations or a combination of green material and biosolids compost. The compost shall be processed or completed to reduce weed seeds, pathogens and deleterious material, and shall not contain paint, petroleum products, herbicides, fungicides or other chemical residues that would be harmful to plant or animal life. Other deleterious material, plastic, glass, metal or rocks shall not exceed 0.1 percent by weight or volume. A minimum internal temperature of 57°C shall be maintained for at least 15 continuous days during the composting process. The compost shall be thoroughly turned a minimum of 5 times during the composting process and shall go through a minimum 90-day curing period after the 15-day thermophilic compost process has been completed. Compost shall be screened through a maximum 9.5-mm screen. The moisture content of the compost shall not exceed 35 percent. Compost products with a higher moisture content may be used provided the weight of the compost is increased to equal the compost with a moisture content of 35 percent. Moist samples of compost on an as received basis shall be dried in an oven at a temperature between 105°C and 115°C until a constant dry weight of the sample is achieved. The percentage of moisture will be determined by dividing the dry weight of the sample by the moist weight of the sample and then multiplying by 100. Compost will be tested for maturity and stability with a Solvita test kit. The compost shall measure a minimum of 6 on the maturity and stability scale.

APPLICATION

Erosion control materials shall be applied in 5 separate applications in the following sequence:

A. Straw shall be applied and incorporated into the soil at the rate of 4 tonnes per hectare (slope measurement).
B. Legume seed shall be applied by a dry method at the rate of 5 kilograms per hectare (slope measurement). Legume seed shall not be applied with hydro-seeding equipment.
C. The following mixture in the proportions indicated shall be applied. If hydro-seeding equipment is used, the mixture shall be applied within 60 minutes after the seed and compost has been added to the mixture.

Material	Kilograms Per Hectare (Slope Measurement)
Non-Legume Seed	16.5
Fiber	400
Compost	1200

D. The Contractor may dry apply compost at the rate specified above instead of including it as part of the hydro-seeding operation. Dry applying compost shall occur before the second application of straw.
E. A second application of straw shall be applied and incorporated into the soil at the rate of 4 tonnes per hectare based on slope measurements.
The following mixture in the proportions indicated shall be applied with hydro-seeding equipment:

Material	Kilograms Per Hectare (Slope Measurement)
Fiber	500
Commercial Fertilizer	150
Stabilizing emulsion (solids)	150
Compost	1800

The proportions of erosion control materials may be changed by the Engineer to meet field conditions.

MEASUREMENT AND PAYMENT

Compost (erosion control) will be measured by the kilogram or tonne, whichever unit is designated in the Engineer's Estimate The weight will be as determined by the Engineer from marked mass and sack count or from scale weighings.

The contract price paid per kilogram or tonne for compost (erosion control) shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in applying compost for erosion control, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

10-1.29 EROSION CONTROL (TYPE D)

Erosion control (Type D) shall conform to the provisions in Section 20-3, "Erosion Control," of the Standard Specifications and these special provisions and shall consist of applying erosion control materials to embankment and excavation slopes and other areas disturbed by construction activities.

If the slope on which the erosion control is to be placed is finished during the rainy season as specified in "Water Pollution Control" of these special provisions, the erosion control shall be applied immediately to the slope.

Prior to installing erosion control materials, soil surface preparation shall conform to the provisions in Section 19-2.05, "Slopes," of the Standard Specifications, except that rills and gullies exceeding 50 mm in depth or width shall be leveled. Vegetative growth, temporary erosion control materials, and other debris shall be removed from areas to receive erosion control.

MATERIALS

Materials shall conform to the provisions in Section 20-2, "Materials," of the Standard Specifications and these special provisions.

Seed

Seed shall conform to the provisions in Section 20-2.10, "Seed," of the Standard Specifications. Individual seed species shall be measured and mixed in the presence of the Engineer.

Seed shall be delivered to the project site in unopened separate containers with the seed tag attached. Containers without a seed tag attached will not be accepted.

A sample of approximately 30 g of seed will be taken from each seed container by the Engineer.

Legume Seed

Legume seed shall be pellet-inoculated or industrial-inoculated and shall conform to the following:

A. Inoculated seed shall be inoculated in conformance with the provisions in Section 20-2.10, "Seed," of the Standard Specifications.
B. Inoculated seed shall have a calcium carbonate coating.
C. Industrial-inoculated seed shall be inoculated with Rhizobia and coated using an industrial process by a manufacturer whose principal business is seed coating and seed inoculation.
D. Industrial-inoculated seed shall be sown within 180 calendar days after inoculation.
E. Legume seed shall consist of the following:

LEGUME SEED

Botanical Name (Common Name)	Percent Germination (Minimum)	Kilograms Pure Live Seed Per Hectare (Slope Measurement)
Lotus Purshianus (Purshing Lotus)	50	3.0
Lupinus Bi-color (Pigmy Leafed Lupine)	50	2.0

Non-Legume Seed

Non-legume seed shall consist of the following:

NON-LEGUME SEED

Botanical Name (Common Name)	Percent Germination (Minimum)	Kilograms Pure Live Seed Per Hectare (Slope Measurement)
Bromus Carinatus (California Brome)	50	5.0
Elymus Glaucus "Anderson" (Anderson Blue Wildrye)	50	2.5
Leymus Triticoides (Creeping Wildrye)	50	2.0
Nassella Pulchra (Purple Needlegrass)	50	3.5
Eschscholzia Californica (California Poppy)	50	1.0
Vulpia Microstachya (Three Week Fescue)	50	2.5

Commercial Fertilizer

Commercial fertilizer shall conform to the provisions in Section 20-2.02, "Commercial Fertilizer," of the Standard Specifications.

Straw

Straw shall be derived from any of the plant species that are listed on the seed list. Straw shall be free of plastic, glass, metal, rocks, and refuse or other deleterious material.

Compost

Compost shall be derived from green material consisting of chipped, shredded or ground vegetation or clean processed recycled wood products or a Class A, exceptional quality biosolids composts, as required by the United States Environmental Protection Agency (EPA), 40 CFR, Part 503c regulations or a combination of green material and biosolids compost. The compost shall be processed or completed to reduce weed seeds, pathogens and deleterious material, and shall not contain paint, petroleum products, herbicides, fungicides or other chemical residues that would be harmful to plant or animal life. Other deleterious material, plastic, glass, metal or rocks shall not exceed 0.1 percent by weight or volume. A minimum internal temperature of 57˚C shall be maintained for at least 15 continuous days during the composting process. The compost shall be thoroughly turned a minimum of 5 times during the composting process and shall go through a minimum 90-day curing period after the 15-day thermophilic compost process has been completed. Compost shall be screened through a maximum 9.5-mm screen. The moisture content of the compost shall not exceed 35 percent. Compost products with a higher moisture content may be used provided the weight of the compost is increased to equal the compost with a moisture content of 35 percent. Moist samples of compost on an as received basis shall be dried in an oven at a temperature between

105°C and 115°C until a constant dry weight of the sample is achieved. The percentage of moisture will be determined by dividing the dry weight of the sample by the moist weight of the sample and then multiplying by 100. Compost will be tested for maturity and stability with a Solvita test kit. The compost shall measure a minimum of 6 on the maturity and stability scale.

Stabilizing Emulsion

Stabilizing emulsion shall conform to the provisions in Section 20-2.11, "Stabilizing Emulsion," of the Standard Specifications and these special provisions.

Stabilizing emulsion shall be in a dry powder form, may be reemulsifiable, and shall be a processed organic adhesive used as a soil tackifier.

APPLICATION

Erosion control materials shall be applied in 5 separate applications in the following sequence:

A. Legume seed shall be applied by a dry method at the rate of 5 kg per hectare (slope measurement). Legume seed shall not be applied with hydro-seeding equipment.
B. The following mixture in the proportions indicated shall be applied with hydro-seeding equipment within 60 minutes after the seed and compost has been added to the mixture:

Material	Kilograms Per Hectare (Slope Measurement)
Non-Legume Seed	16.5
Fiber	400
Compost	1200

C. The Contractor may dry apply compost at the total of the rates specified in the preceding table and the following table instead of including it as part of the hydro-seeding operations. In areas where the compost is dry applied, all compost for that area shall be applied before the next operation.
D. Straw shall be applied at the rate of 4 tonnes per hectare based on slope measurements. Incorporation of straw will not be required. Straw shall be distributed evenly without clumping or piling.
E. The following mixture in the proportions indicated shall be applied with hydro-seeding equipment:

Material	Kilograms Per Hectare (Slope Measurement)
Fiber	500
Compost	1800
Commercial Fertilizer	150
Stabilizing Emulsion (Solids)	150

The ratio of total water to total stabilizing emulsion in the mixture shall be as recommended by the manufacturer.

Once straw work is started in an area, stabilizing emulsion applications shall be completed in that area on the same working day.

The proportions of erosion control materials may be changed by the Engineer to meet field conditions.

MEASUREMENT AND PAYMENT

Compost (erosion control) will be measured by the kilogram or tonne, whichever unit is designated in the Engineer's Estimate. The weight will be as determined by the Engineer from marked mass and sack count or from scale weighings.

The contract price paid per kilogram or tonne for compost (erosion control) shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in applying compost for erosion control, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

EROSION CONTROL BLANKET (TYPE 1)

Erosion control blanket (Type 1) shall conform to the details shown on the plans, the provisions in Section 20-3, "Erosion Control," of the Standard Specifications and these special provisions.

Erosion control blanket (Type 1) work shall consist of providing and applying seed, fiber and commercial fertilizer and installing erosion control blanket along ditches, in accordance with manufacturer's recommendations for channel liners and as designated by the Engineer.

MATERIALS

Materials shall conform to the provisions in Section 20-2, "Materials," of the Standard Specifications and these special provisions. Erosion control blanket (Type 1) shall consist of polypropylene mats secured in place with wire staples and shall conform to the following:

Polypropylene Blanket

Polypropylene blanket material shall consist of machine produced mats, UV stabilized polypropylene fiber matrix sewn top and bottom, 50 mm or less on center, between heavy duty UV stabilized plastic mesh. The erosion control blanket (Type 1) shall be of consistent thickness and the polypropylene fiber shall be evenly distributed over the entire area of the blanket. The blanket shall be smolder resistant without the use of chemical additives and shall be non-toxic and non-injurious to plant and animal life. Erosion control blanket shall be furnished in rolled strips, a minimum of 1220mm ± 25 mm in width, and shall have an average mass of 0.43-kg/m^2 ± 10 percent at the time of manufacture.

Staples

Staple for erosion control blankets shall be made of 8-gauge minimum steel wire and shall be U-shaped with 200mm legs and a 50 mm crown.

Seed

Seed shall conform to the provisions in Section 20-2.10, "Seed," of the Standard Specifications. Individual seed species shall be measured and mixed in the presence of the Engineer.

Seed shall be delivered to the job site in unopened separate containers with the seed tag attached. Containers without a seed tag attached will not be accepted.

A sample of approximately 30 g of seed will be taken from each seed container by the Engineer.

Legume Seed

Legume seed shall be pellet-inoculated or industrial-inoculated and shall conform to the following:

A. Inoculated seed shall be inoculated in conformance with the provisions in Section 20-2.10, "Seed," of the Standard Specifications.
B. Inoculated seed shall have a calcium carbonate coating.
C. Industrial-inoculated seed shall be inoculated with Rhizobia and coated using an industrial process by a manufacturer whose principal business is seed coating and seed inoculation.
D. Industrial-inoculated seed shall be sown within 180 calendar days after inoculation.
E. Legume seed shall consist of the following:

LEGUME SEED

Botanical Name (Common Name)	Percent Germination (Minimum)	Kilograms Pure Live Seed Per Hectare (Slope Measurement)
Lotus Purshianus (Purshing Lotus)	50	3.0
Lupinus Bi-color (Pigmy Leafed Lupine)	50	2.0

Non-Legume Seed

Non-legume seed shall consist of the following:

NON-LEGUME SEED

Botanical Name (Common Name)	Percent Germination (Minimum)	Kilograms Pure Live Seed Per Hectare (Slope Measurement)
Bromus Carinatus (California Brome)	50	5.0
Elymus Glaucus "Anderson" (Anderson Blue Wildrye)	50	2.5
Leymus Triticoides (Creeping Wildrye)	50	2.0
Nassella Pulchra (Purple Needlegrass)	50	3.5
Eschscholzia Californica (California Poppy)	50	1.0
Vulpia Microstachya (Three Week Fescue)	50	2.5

Commercial Fertilizer

Commercial fertilizer shall conform to the provisions in Section 20-2.02, "Commercial Fertilizer," of the Standard Specifications.

Straw

Straw shall conform to the provisions in Section 20-2.06, "Straw," of the Standard Specifications and these special provisions.

Straw shall be derived from any of the plant species that are listed on the seed list. Straw shall be free of plastic, glass, metal, rocks, and refuse or other deleterious material

APPLICATION

Prior to placing erosion control blanket (Type 1), the surface upon which blanket is to be placed, shall be free of loose or extraneous material and sharp objects that may damage the blanket during installation or prevent intimate contact with the soil. Erosion control blanket (Type 1) material shall be placed in separate applications as follows:

The first application shall consist of applying fiber, seed and commercial fertilizer at the following rates and in the following sequence:

Fiber, seed and commercial fertilizer shall be applied at the rates indicated in the following table. The mixture shall be applied within 60 minutes after the seed has been added to the mixture.

Material	Kilograms Per Hectare (Slope Measurement)
Non-Legume Seed	16.5
Legume Seed	6
Commercial Fertilizer	100
Fiber	600

The second application shall consist of installing the erosion control blanket over the fiber, seed and commercial fertilizer application as follows:

Erosion control blanket (Type 1) shall be handled and placed along ditches, in accordance with manufacturer's recommendations for channel liners and as directed by the Engineer. Erosion control blanket (Type1) shall be secured in a 150 mm by 300 mm anchoring trench constructed at the top of slope, and shall be extended 600 mm to 900 mm over the crest of slope, secured into trench with anchoring devices, backfilled and compacted. Longitudinal and transverse joints of blankets shall be butted snugly against adjacent strips or overlapped according to the manufacturer's recommendations and stapled. Staples shall be driven perpendicular to the slopes, and shall be located and spaced in accordance with the manufacturer's instructions. Ends of the blankets shall be secured in place according to the manufacturer's instructions.

The third application shall consist of applying fiber.

Fiber shall be applied at the rate in the following table.

Material	Kilograms Per Hectare (Slope Measurement)
Fiber	600

MEASUREMENT AND PAYMENT

The quantity of erosion control blanket (Type1) to be paid for will be determined by the square meter from actual slope measurement of the area covered by the erosion control blanket (Type1).

The contract price paid per square meter for erosion control blanket (Type 1) shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in erosion control blanket (Type 1), complete in place, including furnishing and applying seed, commercial fertilizer, and fiber, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

10-1.30 TRANSPLANT EXISTING ELDERBERRY

Transplanting existing elderberry shall conform to the provisions in Section 20-4, "Highway Planting," of the Standard Specifications and these special provisions.

Existing elderberry to be transplanted shall be removed and transplanted to their new locations during the dormant period between November and mid-February as directed by the Engineer prior to performing other work within the location of the existing elderberry. All elderberry shall be planted at the new locations as directed by the Engineer the same day they are removed.

Elderberry to be transplanted shall be pruned back to 0.9-1.8m from the ground or to 50 percent of their height (whichever is taller) just prior to removing the elderberry. Pruning of elderberry to be transplanted shall include removal of broken or bruised branches 25 mm or larger in diameter, and deadwood. Pruning shall be in conformance with the provisions in Section 20-4.055, "Pruning," of the Standard Specifications. Tree seal compounds shall not be used to cover pruning cuts.

Removed pruned elderberry materials shall be reduced to chips and spread within the area where the transplanted elderberry are to be planted as directed by the Engineer.

The Contractor shall determine the methods to be used to transplant elderberry, including removing, transporting, planting, and maintaining the elderberry. The Contractor shall submit a proposed plan for this work, in writing, to the Engineer prior to the start of the work. The proposed plan shall include, but not necessarily be limited to, root ball size, method of root ball containment, and maintenance programs for each elderberry to be transplanted.

When elderberry are planted, a root stimulant, approved by the Engineer, shall be applied to the roots of each elderberry in conformance with the printed instructions of the root stimulant manufacturer. A copy of the instructions shall be furnished to the Engineer before applying any stimulant. Root stimulant to be used shall be submitted to the Engineer not less than 2 weeks prior to the stimulant's intended use. Root stimulants not approved by the Engineer shall not be used.

Holes resulting from the removal of transplanted elderberry shall be backfilled the same day the elderberry are removed. Soil from the surrounding area may be used to backfill these holes. The backfill shall be graded to conform with the adjacent existing grade.

Watering basins shall be constructed around each transplanted elderberry.

Elderberry to be transplanted shall be maintained from the time the elderberry are removed to the time of acceptance of the contract. The elderberry shall be watered and fertilized as necessary to maintain the elderberry in a healthy condition. Trash, debris and weeds within basins, including the basin walls, shall be removed and disposed of 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. Weeds shall be removed before the weeds exceed 50 mm in length. Pesticides shall not be used.

The provisions in Section 20-4.07, "Replacement," of the Standard Specifications for the replacement of unsuitable plants shall apply to transplanted elderberry. The replacement elderberry for each unsuitable transplanted elderberry shall be the same size and species as the elderberry being replaced, except 2, No. 15 container size elderberry shall be planted instead of one elderberry of the size originally transplanted. The No. 15 container size elderberry shall be planted in individual plant holes at the locations designated by the Engineer within the area of the elderberry being replaced. Removed unsuitable transplanted elderberry shall be disposed of 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 quantity of transplant existing elderberry will be measured by the unit as determined from actual count in place, excluding additional replacement bushes.

The contract unit price paid for transplant existing elderberry shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in transplanting existing elderberry, complete in place, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

10-1.31 FINISHING ROADWAY

Finishing roadway shall conform to the provisions in Section 22, "Finishing Roadway," of the Standard Specifications.

10-1.32 AGGREGATE SUBBASE

Aggregate subbase shall be Class 4 and shall conform to the provisions in Section 25, "Aggregate Subbases," of the Standard Specifications and these special provisions.

The restriction that the amount of reclaimed material included in Class 4 aggregate subbase not exceed 50 percent of the total volume of the aggregate used shall not apply. Aggregate for Class 4 aggregate subbase may include reclaimed glass. Aggregate subbase incorporating reclaimed glass shall not be placed at locations where surfacing will not be placed over the aggregate subbase.

The percentage composition by mass of Class 4 aggregate subbase shall conform to the following grading requirements:

Grading Requirements (Percentage Passing)

Sieve Sizes	Operating Range	Contract Compliance
63 mm	100	100
No. 200	0-30	0-34

Class 4 aggregate subbase shall also conform to the following quality requirements:

Quality Requirements

Test	Operating Range	Contract Compliance
Sand Equivalent	21 Min.	18 Min.
Resistance (R-value)	----	50 Min.

10-1.33 AGGREGATE BASE

Aggregate base shall be Class 2 and shall conform to the provisions in Section 26, "Aggregate Bases," of the Standard Specifications and these special provisions.

The restriction that the amount of reclaimed material included in Class 2 aggregate base not exceed 50 percent of the total volume of the aggregate used shall not apply. Aggregate for Class 2 aggregate base may include reclaimed glass. Aggregate base incorporating reclaimed glass shall not be placed at locations where surfacing will not be placed over the aggregate base.

10-1.34 TREATED PERMEABLE BASE

Treated permeable base shall be asphalt treated and shall conform to the provisions in Section 29, "Treated Permeable Bases," of the Standard Specifications.

10-1.35 ASPHALT CONCRETE

Asphalt concrete shall be Type B and shall conform to the provisions in Section 11-1, "Quality Control / Quality Assurance," of these special provisions and these special provisions.

Surfacing of miscellaneous areas with asphalt concrete shall conform to the provisions in "Asphalt Concrete (Miscellaneous Areas)" of these special provisions.

The Contractor may obtain a copy of the Department's "Manual for Quality Control and Quality Assurance for Asphalt Concrete" at www.dot.ca.gov/hq/construc/qcqa.html.

The aggregate for Type B asphalt concrete shall conform to the 19 mm maximum, medium grading specified in Section 39-2.02, "Aggregate," in Section 11-1, "Quality Control / Quality Assurance," of these special provisions.

In addition to the provisions in Section 39-9.01, "Spreading Equipment," in Section 11-1, "Quality Control / Quality Assurance," of these special provisions, asphalt paving equipment shall be equipped with automatic screed controls and a sensing device or devices.

When placing the initial mat of asphalt concrete on existing pavement, the end of the screed nearest the centerline shall be controlled by a sensor activated by a ski device not less than 9 m long. The end of the screed farthest from centerline shall be controlled by a sensor activated by a similar ski device.

When paving contiguously with previously placed mats, the end of the screed adjacent to the previously placed mat shall be controlled by a sensor that responds to the grade of the previously placed mat and will reproduce the grade in the new mat within a 3 mm tolerance. The end of the screed farthest from the previously placed mat shall be controlled in the same manner the screed was controlled when placing the initial mat.

If the methods and equipment furnished by the Contractor fail to produce a layer of asphalt concrete conforming to the provisions, including straightedge tolerance, in Section 39-10.04, "Compacting," in Section 11-1, "Quality Control / Quality Assurance," of these special provisions, the paving operations shall be discontinued and the Contractor shall modify the equipment or methods, or furnish substitute equipment.

If the automatic screed controls fail to operate properly during a day's work, the Contractor may use manual control of the spreading equipment for the remainder of that day. However, the equipment shall be corrected or replaced with alternative automatically controlled equipment conforming to the requirements in this section before starting another day's work.

In addition to the straightedge requirements in Section 39-10.04, "Compacting," in Section 11-1, "Quality Control / Quality Assurance," of these special provisions, asphalt concrete pavement shall conform to the surface tolerances specified herein.

The top surface of the uppermost layer of Type B asphalt concrete surfacing shall be profiled by the Contractor, in the presence of the Engineer. Two profiles shall be obtained in each lane. The profiles shall be approximately one meter from and parallel with the edge of the lane.

Profiles shall be performed using a California Profilograph or equivalent in conformance with the requirements in California Test 526 and as specified in these special provisions. Prior to beginning profiles, the profilograph shall be calibrated in the presence of the Engineer.

Asphalt concrete pavement shall conform to the following Profile Index requirements:

A. Pavement on tangent alignment and pavement on horizontal curves having a centerline curve radius of 600 m or more shall have a Profile Index of 8 mm or less for each 0.1-km section profiled.
B. Pavement on horizontal curves having a centerline curve radius of 300 m or more but less than 600 m, including the pavement within the superelevation transition of these curves, shall have a Profile Index of 16 mm or less for each 0.1-km section profiled.
C. Pavement containing high point areas with deviations indicated by the profilograph in excess of 7.5 mm in a length of 7.5 m or less shall be corrected by the Contractor regardless of the Profile Index of the each 0.1-km section profiled.

Profile Index requirements will not apply to the following areas of asphalt concrete pavement, but these areas shall conform to the straightedge requirements in Section 39-10.04, "Compacting," in Section 11-1, "Quality Control / Quality Assurance," of these special provisions:

A. Pavement on horizontal curves with a centerline curve radius of less than 300 m and pavement within the superelevation transition on those curves.
B. Pavement with a total thickness of 75 mm or less.
C. Pavement placed in a single lift when required by the special provisions.
D. Pavement with extensive grade or cross slope correction which does not receive advance leveling operations in conformance with the provisions in Section 39-10.03, "Spreading," in Section 11-1, "Quality Control / Quality Assurance," of these special provisions.
E. Pavement for ramps and connectors with steep grades and high rates of superelevation, as determined by the Engineer.
F. Pavement on city or county streets and roads.
G. Pavement on turn lanes and collector lanes that are less than 500 meters in length.
H. Shoulders and miscellaneous areas.
I. Pavement placed one meter from and parallel with the joint between asphalt concrete pavement and existing curbs, gutters or existing pavement.
J. Pavement within 15 m of a transverse joint that separates the pavement from an existing pavement, approach slab or structure surface not constructed under the contract.

The Contractor shall complete initial runs of the profilograph prior to opening new pavement to public traffic. Profilograph operations shall be in conformance with the lane closure requirement in "Maintaining Traffic" of these special provisions. In the event that initial profiles can not be made prior to opening the pavement to public traffic, they shall be made the next day that lane closures are permitted for the area to be profiled.

Areas of the top surface of the uppermost layer of Type B asphalt concrete pavement that do not meet the specified surface tolerances shall be brought within tolerance by abrasive grinding. Abrasive grinding shall conform to the provisions in the first paragraph and the last 4 paragraphs in Section 42-2.02, "Construction," of the Standard Specifications, except that the grinding residue shall be disposed of outside the highway right of way.

Abrasive grinding shall be performed to reduce individual deviations in excess of 7.5 mm, and to reduce the Profile Index of the pavement to be within the specified tolerance. Deviations in excess of 7.5 mm which cannot be brought into specified tolerances by abrasive grinding shall be corrected by removal and replacement. The corrective method for each area shall be selected by the Contractor and shall be approved by the Engineer prior to beginning the corrective work. Replacement pavement not meeting the specified tolerances shall be corrected by the method specified above. Corrective work shall be at the Contractor's expense except that flagging costs will be paid for in conformance to the provisions in Section 12-2, "Flagging," of the Standard Specifications. . The Contractor shall profile the areas that have received abrasive grinding or corrective work until the final Profile Index of the area is within the specified tolerance.

When abrasive grinding is used to bring the top surface of the uppermost layer of asphalt concrete surfacing within the specified surface tolerances, additional abrasive grinding shall be performed as necessary to extend the area ground in each lateral direction so that the lateral limits of grinding are at a constant offset from, and parallel with, the nearest lane line or pavement edge, and in each longitudinal direction so that the grinding begins and ends at lines normal to the pavement centerline, within a ground area. Ground areas shall be neat rectangular areas of uniform surface appearance.

The original of the final profilograms that indicate the pavement surface is within the Profile Index specified shall become the property of the State and shall be delivered to the Engineer prior to acceptance of the contract.

Full compensation for performing profiles corrective work shall be considered as included in the contract price paid per tonne for asphalt concrete (Type B) and no additional compensation will be allowed therefor.

Shoulders adjacent to a lane being paved shall be surfaced prior to opening the lane to public traffic.

Attention is directed to "Rumble Strips," of these special provisions. Areas within shoulders in which rumble strips are constructed will not be subject to the provisions in Section 39-11.02, "Statistical Evaluation and Determination of Pay Factor," in Section 11-1, "Quality Control / Quality Assurance," of these special provisions.

10-1.36 ASPHALT CONCRETE (MISCELLANEOUS AREAS)

Surfacing of miscellaneous areas with asphalt concrete shall conform to the provisions for miscellaneous areas in Section 39, "Asphalt Concrete," of the Standard Specifications and these special provisions.

Asphalt concrete placed in miscellaneous areas may be produced in conformance with the requirements for asphalt concrete placed on the traveled way in Section 11-1, "Quality Control / Quality Assurance," of these special provisions.

The amount of asphalt binder used in asphalt concrete placed in dikes, gutters, gutter flares, overside drains, and aprons at the ends of drainage structures shall be increased one percent by mass of the aggregate over the amount of asphalt binder determined for use in asphalt concrete placed on the traveled way.

Aggregate for asphalt concrete dikes shall conform to the 9.5-mm maximum grading specified in Section 39-2.02, "Aggregate," of the Standard Specifications.

The miscellaneous areas to be paid for at the contract price per square meter for place asphalt concrete (miscellaneous area) in addition to the prices paid for the materials involved shall be limited to the areas listed on the plans.

Asphalt concrete placed in miscellaneous areas will be paid for at the contract price per tonne for asphalt concrete in conformance with the provisions in Section 11-1, "Quality Control / Quality Assurance," of these special provisions. Section 39-11.02, "Statistical Evaluation and Determination of Pay Factor," in Section 11-1, "Quality Control / Quality Assurance," of these special provisions, shall not apply to asphalt concrete placed in miscellaneous areas. Payment for placing asphalt concrete in miscellaneous areas and dikes will be in conformance with the provisions in Section 39-8.02, "Payment," of the Standard Specifications.

10-1.37 SHOULDER RUMBLE STRIP (ASPHALT CONCRETE, ROLLED-IN INDENTATIONS)

This work shall consist of constructing shoulder rumble strips by forming indentations in new asphalt concrete surfacing as shown on the plans and as specified in these special provisions.

Shoulder rumble strips shall be formed by constructing indentations in the top layer of new asphalt concrete surfacing.

Shoulder rumble strips shall not be constructed on approach slabs or structures.

Shoulder rumble strips shall be formed with a steel-tired 2-axle tandem roller, having a roller wheel diameter of 1000 mm or greater, weighing not less than 11 tonnes, and modified by fitting with pipe segments attached to the non-steering roller drum. Pipe segments shall be fabricated from 50-mm diameter commercial quality steel pipe, 300 mm in length, cut longitudinally to provide a 40 percent segment in cross section. Pipe segments shall be rounded at each end to provide indentations of the dimensions shown on the plans. Pipe segments shall be welded to the driving, non-steering roller drum at approximately 200-mm centers, with the rounded side of the pipe away from the drum. Other means of constructing indentations may be approved by the Engineer.

Breakdown compaction and forming of the rolled-in indentations shall be completed before the temperature of the surface of the asphalt concrete falls below 110°C. After breakdown compaction has been completed, indentations shall be formed by making a single pass with the modified roller drum in the trailing position. Final rolling shall be completed before the pavement temperature drops below 60°C.

Rumble strips shall be constructed within 50 mm of the required alignment. The tandem roller shall be equipped with a sighting device that will enable the operator to maintain the alignment of the rumble strip.

Indentations shall not vary from the dimensions shown on the plans by more than 10 percent.

Finished rumble strips not meeting the specified tolerances, shall be brought within tolerance by either abrasive grinding, or removal and replacement. The corrective method will be selected by the Engineer. Ground surface areas shall be neat and uniform in appearance, and shall be treated with an application of fog seal coat. The corrective work shall be at the Contractor's expense.

Shoulder rumble strip (asphalt concrete, rolled-in indentations) will be measured by the station along each shoulder on which the rumble strip is constructed, without deductions for gaps between the individual rolled-in indentations.

The contract price paid per station for shoulder rumble strip (asphalt concrete, rolled-in indentations) shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in constructing shoulder rumble strips (asphalt concrete, rolled-in indentations), complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

10-1.38 PILING

GENERAL

Piling shall conform to the provisions in Section 49, "Piling," of the Standard Specifications, and these special provisions.

Unless otherwise specified, welding of any work performed in conformance with the provisions in Section 49, "Piling," of the Standard Specifications, shall be in conformance with the requirements in AWS D1.1.

Foundation recommendations are included in the "Information Handout" available to the Contractor as provided for in Section 2-1.03, "Examination of Plans, Specifications, Contract, and Site of Work," of the Standard Specifications.

Attention is directed to "Welding" of these special provisions.

Difficult pile installation is anticipated due to the presence of intensely fractured to slightly fractured (hard to extremely hard) greenstone bedrock and subsurface concrete debris.

MEASUREMENT AND PAYMENT (PILING)

Measurement and payment for the various types and classes of piles shall conform to the provisions in Sections 49-6.01, "Measurement," and 49-6.02, "Payment," of the Standard Specifications and these special provisions.

10-1.39 PRESTRESSING CONCRETE

Prestressing concrete shall conform to the provisions in Section 50, "Prestressing Concrete," of the Standard Specifications and these special provisions.

The details shown on the plans for cast-in-place prestressed box girder bridges are based on a bonded full length draped tendon prestressing system. For these bridges the Contractor may, in conformance with the provisions in Section 5-1.14, "Cost Reduction Incentive," of the Standard Specifications, propose an alternative prestressing system utilizing bonded partial length tendons provided the proposed system and associated details meet the following requirements:

A. The proposed system and details shall provide moment and shear resistances at least equal to those used for the design of the structure shown on the plans.
B. The concrete strength shall not be less than that shown on the plans.
C. Anchorage blocks for partial length tendons shall be located so that the blocks will not interfere with the placement of the utility facilities shown on the plans or of any future utilities to be placed through openings shown on the plans.
D. Temporary prestressing tendons, if used, shall be detensioned, and the temporary ducts shall be filled with grout before completion of the work. Temporary tendons shall be either removed or fully encased in grout before completion of the work.
E. All details of the proposed system, including supporting checked calculations, shall be included in the drawings submitted in conformance with the provisions in Section 50-1.02, "Drawings," of the Standard Specifications.

Moments and shears for loads used in the design shown on the plans will be made available to the Contractor upon written request to the Engineer.

10-1.40 TIEDOWN ANCHORS

Tiedown anchors in bridge footings; consisting of steel bar tendons with anchorage assemblies that are grouted indrilled holes; shall conform to the provisions in Section 50, "Prestressing Concrete," of the Standard Specifications, these special provisions and the details shown on the plans.

Whenever "member" is referred to in Section 50, "Prestressing Concrete," of the Standard Specifications it shall be considered to mean tiedown anchor.

Foundation recommendations are included in the "Materials Information Handout" available to the Contractor in conformance with the provisions in Section 2-1.03, "Examination of Plans, Specifications, Contract, and Site of Work," of the Standard Specifications.

Difficult tiedown installation is anticipated due to the presence of intensely fractured to slightly fractured (hard to extremely hard) greenstone bedrock, high ground water, cobbles and boulders.

The Contractor shall determine the bond length necessary to meet acceptance criteria specified herein.

The submittal of microfilms will not be required for tiedown anchor installations.

In fabricating, handling, shipping, and placing tiedown anchors, adequate care shall be taken to avoid damage to the sheathing. All damage to the sheathing caused by handling and fabrication prior to tiedown anchor installation shall be repaired or replaced as determined by the Engineer. Repair procedure for the sheathing shall be included in the working drawings.

MATERIALS

The steel bearing plate of the anchorage assembly shall conform to the provisions of Section 75-1.03, "Miscellaneous Bridge Metal," of the Standard Specifications. .

Grout shall conform to the provisions in Section 50-1.09, "Bonding and Grouting," of the Standard Specifications. Fine aggregate may be added to the grout mixture of portland cement and water outside of the grouted sheathing in drilled holes that are 200 mm or greater in diameter, but only to the extent that the cement content of the grout is not less than 500 kg/m^3 of grout. Fine aggregate, if used, shall conform to the provisions in Section 90-2, "Materials," and Section 90-3, "Aggregate Gradings," of the Standard Specifications.

Smooth and corrugated plastic sheathing, including joints, shall be watertight. Polyvinyl chloride (PVC) sheathing shall conform to ASTM Designation: D 1784, Class 13464-B. High density polyethylene (HDPE) sheathing shall have a density between 0.940 and 0.960-g/cm^3 as measured in accordance with ASTM Designation: D 792, A-2. Corrugated plastic sheathing shall be PVC or HDPE.

Corrugated sheathing for bar tendons shall have a nominal wall thickness of 1.0 mm.

Strand type tendons shall not be used.

CONSTRUCTION

Tiedown anchors shall be installed in accordance with the manufacturer's recommendations. In case of a conflict between the manufacturer's recommendations and these special provisions, these special provisions shall prevail.

Water and grout from tiedown anchor construction operations shall not be permitted to fall on public traffic, to flow across shoulders or lanes occupied by public traffic, or to flow into landscaping, gutters or other drainage facilities. Excessive amounts of water shall not be used in any of the drilling and the tiedown anchor installation procedures.

The holes drilled in the foundation materials shall be drilled to a depth sufficient to provide the necessary bond length beyond the minimum unbonded length shown on the plans. The diameter of the hole shall be large enough to provide a minimum of 25 mm grout cover over the corrugated plastic sheathing for the full-length of the tendon. Centralizers shall be used full-length of the tendon.

Tiedown anchor holes in foundation material shall be drilled by either the rotary or percussion drilling method.

Prior to installing each tiedown anchor into the anchor hole, the anchor shall be clean and free of oil, grease, dirt or other extraneous substance.

Tiedown anchor steel shall be protected prior to completion of all grouting against rust, corrosion, and physical damage in conformance with the provisions in Section 50, "Prestressing Concrete," of the Standard Specifications. In addition, there shall be no evidence of distress in the plastic sheathing or crushing of the cement grout within the sheathing.

Pregrouting shall occur at least 48 hours before placing the tendon in the drilled hole.

Tiedown anchor grout placed in the drilled hole shall be placed using grout tubes.

Grout shall be injected at the low end of the void being filled and shall be expelled at the high end until there is no evidence of entrapped air, water or diluted grout.

After initial grouting, the tiedown anchor shall remain undisturbed until the grout has reached a strength sufficient to provide anchorage during load testing.

Additional requirements for tiedowns with bar type tendons are as follows:

A. The bar tendons in the unbonded area shall be sheathed with smooth sheathing, as shown on the plans. For this portion of smooth sheathing there is no minimum wall thickness and the sheathing shall be either PVC or HDPE.
B. In addition, bar tendons shall be sheathed full-length with corrugated plastic. The annular space between the bar and the corrugated sheathing shall be pregrouted prior to placing the tendons in the drilled hole.
C. There shall be a seal between the smooth sheathing and the corrugated sheathing at the top and bottom of the length of smooth sheathing.
D. For bar tendons, the initial grout in the drilled hole may be placed before or after insertion of the bar tendons.

Testing

All tiedowns shall be load tested by either a performance test or a proof test. The magnitude of applied test loads shall be determined with a calibrated pressure gauge or a load cell. Movements of the end of the tiedown anchor, relative to an independent fixed reference point, shall be measured and recorded to the nearest 0.025-mm at each load increment during the load tests. The Contractor shall perform the measuring and recording.

At the completion of testing tiedown anchors, or when requested by the Engineer, the Contractor shall furnish to the Engineer complete test results for each tiedown anchor tested. Data for each test shall list key personnel, test loading equipment, tiedown anchor location, hole diameter, method of drilling, and bonded and unbonded length of tiedown anchor. Test data shall also list quantity of grout and grout pressure used within the bonded length of the tiedown anchor, amount of ground water encountered, the time and dates of drilling, tiedown anchor installation, grouting, and testing. The tiedown anchor end movements at each increment of load or at each increment of time during the load hold period of the loading schedule shall be included in the test data.

Load testing shall be performed against temporary bearing yokes. Temporary yokes shall remain the property of the Contractor.

A minimum of 2 tiedown anchors shall be performance tested at each footing. The Engineer shall determine the location of the tiedown anchors to be performance tested.

The performance test or proof test shall be conducted by measuring the test load applied to the tiedown anchor and recording the tiedown anchor end movement (measured at the end of the tiedown anchor) during incremental loading and unloading the tiedown anchor in accordance with the loading schedule. The test load shall be held constant for 10 minutes. During the load hold, the movement of the end of the tiedown anchor shall be measured at 1, 2, 3, 4, 5, 6, and 10 minutes. If the total recorded movement between one minute and 10 minutes exceeds 1.0 mm, the test load shall be held for an additional 50 minutes. Total movement shall be measured at 15, 20, 25, 30, 45, and 60 minutes. If the load is held for 60 minutes, a creep curve showing the creep movement between one minute and 60 minutes shall be plotted as a function of the logarithm of time.

LOADING SCHEDULES		
PERFORMANCE TEST		PROOF TEST
	(CONT'D)	
AL	AL	AL
0.20T	0.20T	0.20T
AL	0.40T	0.40T
0.20T	0.60T	0.60T
0.40T	0.80T	0.80T
AL 0.20T	1.00T (TEST LOAD)	1.00T (TEST LOAD)
0.40T	AL	AL
0.60T		
AL		
0.20T		
0.40T		
0.60T		
0.80T (CONT'D)		
T = Design force for the tiedown anchor shown plans AL = Alignment load = 0.10T		

For performance and proof tests, each increment of load shall be applied in less than one minute and held for at least one minute but not more than 2 minutes or as specified above. The observation period for the load hold shall start when the pump begins to apply the last increment of load.

The jacking equipment, including the tiedown anchor movement measuring system, shall be stable during all phases of the tiedown anchor loading operations.

All tiedown anchors not performance tested shall be proof tested. If 1.0 times the design force cannot be obtained, the tiedown anchor shall be replaced. Tiedown anchors shall not be retested, unless the tiedown bond length is post-grouted after the unacceptable test.

A performance tested or proof tested tiedown anchor shall conform to the following acceptance criteria:

A. The measured elastic movement of the end of the tiedown tendon exceeds 0.80 of the theoretical elongation of the unbonded length plus the jacking length at the maximum test load; and
B. The creep movement of the end of the tiedown anchor, between one and 10 minutes, is less than 1.0 mm.

Performance tested or proof tested tiedowns that fail to meet the acceptance criterion Letter B will be acceptable if the maximum load is held for 60 minutes and the creep curve plotted from the movement data indicates a creep rate of less than 2.0 mm for the last log cycle of time between 6 and 60 minutes.

Lock-off

After successful testing of the tiedown anchors, the tiedown anchors shall be locked off at a force equal to 0.10T. The lock-off force is the load on the jacks that is maintained while the tiedown anchor head or anchor nuts on the tiedown anchor are permanently set. Immediately after lock-off, a lift-off test shall be performed to demonstrate that the specified lock-off force was obtained. Adjustments in the shim thickness shall be made if required to achieve the specified lock-off force.

MEASUREMENT AND PAYMENT

No payment will be made for tiedown anchors that do not pass the specified testing requirements.

Tiedown anchors will be measured and paid for by the unit, and the number for payment will be determined by the requirements of the details shown on the plans.

The contract unit price paid for tiedown anchor shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in constructing the tiedown anchors (including testing), complete in place, including repair or replacement of sheathing, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

10-1.41 CONCRETE STRUCTURES

Portland cement concrete structures shall conform to the provisions in Section 51, "Concrete Structures," of the Standard Specifications and these special provisions.

GENERAL

Concrete for spread footings shall be placed against undisturbed rock.

Shotcrete shall not be used as an alternative construction method for reinforced concrete members unless otherwise specified.

Vertical, horizontal, radial, or normal dimensions shown on the Typical Section in the plans, are for zero percent cross-slope. At the Contractor's option, the Typical Section of superelevated concrete box girder structures with (1) sloping exterior girders, (2) a straight uninterrupted cross slope between edges of deck, and (3) a single profile grade line, may be rotated around the profile grade line in superelevation areas. The horizontal distances between the profile grade line and the edges of deck shall remain unchanged. The planned girder widths and slab thicknesses shall remain unchanged and the interior girder stems shall remain vertical at the planned locations.

SLIDE HEADGATE

Slide headgates shall conform to the provisions in Section 70, "Miscellaneous Facilities," of the Standard Specifications and these special provisions except payment.

The headgates shall be designed to operate under 3.7 m of head face pressure measured from the center of the headgate cover to the highest water level. The headgate shall be attached to the required pipe size or anchored to a concrete wall.

The headgate shall be complete with cover, spigot-back seat, frame, wedging devices, spacers, stem, lift, bolts and nuts.

Pipe extensions may be used to obtain frame heights greater than the minimum standards of the manufacturer. The diameter of the pipe extension shall be of sufficient size to provide for the maximum thrust load developed by the lift mechanism. The pipe extension shall be bolted to the head angle and the handwheel lift shall be mounted on the top end of the pipe. Suitable bearing plates shall be welded to each end of the pipe extension. The pipe extension shall be galvanized.

The headgate cover, spigot-back seat, wedging devices, and lift assembly consisting of lift nut, hold-down plate, and handwheel shall be manufactured of cast iron conforming to the requirements in ASTM Designation: A 126, Class B, except bronze lift nuts will be permitted. The headgate frame, consisting of side guide angles, head angle, plate gussets, bar braces, spacers, and stems shall be manufactured of steel conforming to the requirements in ASTM Designation: A 36/A 36M. The assembly bolts, or anchor bolts when required, and nuts shall conform to the requirements in ASTM Designation: A 307. The frame members, spacers, stem, bolts and nuts shall be galvanized in conformance with the requirements in ASTM Designation: A 153.

The headgate cover shall be ribbed or domed of ample section to withstand the face pressure. The seating surfaces of the cover and spigot-back seat, shall be machined or ground to fit together within a tolerance of not more than 0.10-mm throughout the circumference of the seating surfaces.

The frame shall be bolted together to form a self-contained unit and shall be designed to take the thrust created during opening and closing the cover.

The gate shall be equipped with a minimum of one adjustable wedging device on each side which shall be bolted to the headgate frame.

Spacers shall be installed to center the guide angle in the slot on the headgate cover.

A sufficient length of stem shall be supplied to move the cover from the fully closed position to the fully opened position. The diameter of the stem shall conform to the following minimums:

Pipe Diameter (mm)	Minimum Stem Diameter (mm)
200 to 400	22
450 to 600	25
675 to 900	28
975 to 1200	38
1350 to 1500	50

The handwheel lifting device shall be mounted on the top of the head angle and shall be of sufficient capacity to easily operate the headgate. The cast iron nut shall be threaded to match the thread of the stem. The nut shall be held in position by the hold-down plate, which will permit easy turning of the nut. The handwheel shall be removable and shall be attached to the lift nut by means of set screws. For headgates, 1200 mm and larger, the lift shall be of the ball bearing design wherein the ball races are mounted above and below a collar on the lift nut.

The headgate shall be assembled in the shop and cast iron parts shall be given a shop coat of commercial quality asphaltic paint furnished by the manufacturer.

Full compensation for furnishing, and installing the valves, as shown on the plans, shall be considered as included in the contract price paid per cubic meter for minor concrete (minor structure) and no separate payment will be made therefore.

CONCRETE

Concrete used in the portions of structures listed in the following table shall contain not less than 400 kilograms of cement per cubic meter and shall be air-entrained as provided under "Materials" of these special provisions.

Structure	Portion of Bridge
Sutter Creek Bridge (Br. No. 26-0040)	All except footings
Amador Creek Bridge (Br. No. 26-0043)	All except footings

FALSEWORK

Falsework shall conform to the provisions in Section 51, "Concrete Structures," of the Standard Specifications and these special provisions.

Falsework supports for the Sutter Creek Bridge (Br. No. 26-0040) shall not be allowed in the sewer plant detention basin. Falsework minimum vertical clearance shall be 5 m above elevation 346.3 m at any location within the limits of the sewer plant detention basin.

The Contractor's engineer who signs the falsework drawings shall also certify in writing that the falsework is constructed in conformance with the approved drawings and the contract specifications prior to placing concrete. This certification shall include performing any testing necessary to verify the ability of the falsework members to sustain the stresses required by the falsework design. The engineer who signs the drawings may designate a representative to perform this certification. Where falsework contains openings for railroads, vehicular traffic, or pedestrians, the designated representative shall be qualified to perform this work, shall have at least three years of combined experience in falsework design or supervising falsework construction, and shall be registered as a Civil Engineer in the State of California. For other falsework, the designated representative shall be qualified to perform this work and shall have at least three years of combined experience in falsework design or supervising falsework construction. The Contractor shall certify the experience of the designated representative in writing and provide supporting documentation demonstrating the required experience if requested by the Engineer.

Welding and Nondestructive Testing

Welding of steel members, except for previously welded splices and except for when fillet welds are used where load demands are less than or equal to 175 N/mm for each 3 mm of fillet weld, shall conform to AWS D1.1 or other recognized welding standard. The welding standard to be utilized shall be specified by the Contractor on the working drawings. Previously welded splices for falsework members are defined as splices made prior to the member being shipped to the project site.

Splices made by field welding of steel beams at the project site shall undergo nondestructive testing (NDT). At the option of the Contractor, either ultrasonic testing (UT) or radiographic testing (RT) shall be used as the method of NDT for each field weld and any repair made to a previously welded splice in a steel beam. Testing shall be performed at locations selected by the Contractor. The length of a splice weld where NDT is to be performed, shall be a cumulative weld length equal to 25 percent of the original splice weld length. The cover pass shall be ground smooth at the locations to be tested. The acceptance criteria shall conform to the requirements of AWS D1.1, Section 6, for cyclically loaded nontubular connections subject to tensile stress. If repairs are required in a portion of the weld, additional NDT shall be performed on the repaired sections. The NDT method chosen shall be used for an entire splice evaluation including any required repairs.

For all field welded splices, the Contractor shall furnish to the Engineer a letter of certification which certifies that all welding and NDT, including visual inspection, are in conformance with the specifications and the welding standard shown on the approved working drawings. This letter of certification shall be signed by an engineer who is registered as a Civil Engineer in the State of California and shall be provided prior to placing any concrete for which the falsework is being erected to support.

For previously welded splices, the Contractor shall determine and perform all necessary testing and inspection required to certify the ability of the falsework members to sustain the stresses required by the falsework design. This welding certification shall be in writing, shall be signed by an engineer who is registered as a Civil Engineer in the State of California, and shall be provided prior to placing any concrete for which the falsework is being erected to support.

COST REDUCTION INCENTIVE PROPOSALS FOR CAST-IN-PLACE PRESTRESSED BOX GIRDER BRIDGES

Except as provided herein, cast-in-place prestressed box girder bridges shall be constructed in conformance with the details shown on the plans and the provisions in Section 50, "Prestressing Concrete," and Section 51, "Concrete Structures," of the Standard Specifications.

If the Contractor submits cost reduction incentive proposals for cast-in-place prestressed box girder bridges, the proposals shall be in conformance with the provisions in Section 5-1.14, "Cost Reduction Incentive," of the Standard Specifications and these special provisions.

The Engineer may reject any proposal which, in the Engineer's judgment, may not produce a structure which is at least equivalent to the planned structure.

At the time the cost reduction incentive proposal (CRIP) is submitted to the Engineer, the Contractor shall also submit 4 sets of the proposed revisions to the contract plans, design calculations, and calculations from an independent checker for all changes involved in the proposal, including revisions in camber, predicted deck profile at each construction stage, and falsework requirements to the Office of Structure Design, Documents Unit, P.O. Box 942874, Sacramento, CA 94274-0001 (1801 30th Street, Sacramento, CA 95816), telephone (916) 227-8230. When notified in writing by the Engineer, the Contractor shall submit 12 sets of the CRIP plan revisions and calculations to the Office of Structure Design for final approval and use during construction. The calculations shall verify that all requirements are satisfied. The CRIP plans and calculations shall be signed by an engineer who is registered as a Civil Engineer in the State of California.

The CRIP plans shall be either 279 mm x 432 mm, or 559 mm x 864 mm in size. Each CRIP plan sheet and calculation sheet shall include the State assigned designations for the contract number, bridge number, full name of the structure as shown on the contract plans, and District-County-Route-Kilometer Post. Each CRIP plan sheet shall be numbered in the lower right hand corner and shall contain a blank space in the upper right hand corner for future contract sheet numbers.

Within 3 weeks after final approval of the CRIP plan sheets, one set of the corrected good quality prints on 75-g/m^2 (minimum) bond paper, 559 mm x 864 mm in size, of all CRIP plan sheets prepared by the Contractor for each CRIP shall be furnished to the Office of Structure Design, Documents Unit.

Each CRIP shall be submitted prior to completion of 25 percent of the contract working days and sufficiently in advance of the start of the work that is proposed to be revised by the CRIP to allow time for review by the Engineer and correction by the Contractor of the CRIP plans and calculations without delaying the work. The Contractor shall allow a minimum of 6 weeks for the review of a CRIP. In the event that several CRIPs are submitted simultaneously, or an additional CRIP is submitted for review before the review of a previously submitted CRIP has been completed, the Contractor shall designate the sequence in which the CRIPs are to be reviewed. In this event, the time to be provided for the review of any proposal in the sequence shall be not less than the review time specified herein for that proposal, plus 2 weeks for each CRIP of higher priority which is still under review.

Should the review not be complete by the date specified in the Contractor's CRIP, or such other date as the Engineer and Contractor may subsequently have agreed to in writing and if, in the opinion of the Engineer, the Contractor's controlling operation is delayed or interfered with by reason of the delay in review of CRIP plans and calculations, an extension of time commensurate with the delay in completion of the work thus caused will be granted as provided in Section 8-1.07, "Liquidated Damages," of the Standard Specifications except that the provisions in Section 8-1.09, "Right of Way Delays," of the Standard Specifications shall not apply.

Permits and approvals required of the State have been obtained for the structures shown on the plans. Proposals which result in a deviation in configuration may require new permits or approvals. The Contractor shall be responsible for obtaining the new permits and approvals before the Engineer will reach a decision on the proposal. Delays in obtaining permits and approvals will not be reason for granting an extension of contract time.

All proposed modifications shall be designed in conformance with the bridge design specifications and procedures currently employed by the Department. The proposal shall include all related, dependent or incidental changes to the structure and other work affected by the proposal. The proposal will be considered only when all aspects of the design changes are included for the entire structure. Changes, such as but not limited to, additional reinforcement and changes in location of reinforcement, necessary to implement the CRIP after approval by the Engineer, shall be made at the Contractor's expense.

Modifications may be proposed in (1) the thickness of girder stems and deck slabs, (2) the number of girders, (3) the deck overhang dimensions as specified herein, (4) the amount and location of reinforcing steel, (5) the amount and location of prestressing force in the superstructure, and (6) the number of hinges, except that the number of hinges shall not be increased. The strength of the concrete used may be increased but the strength employed for design or analysis shall not exceed 42 MPa.

Modifications proposed to the minimum amount of prestressing force which must be provided by full length draped tendons are subject to the provisions in "Prestressing Concrete" of these special provisions.

No modifications will be permitted in (1) the foundation type, (2) the span lengths or (3) the exterior dimensions of columns or bridge superstructure, except that the overhang dimension from face of exterior girder to the outside edge of roadway deck may be uniformly increased or decreased by 25 percent on each side of the box girder section. Fixed connections at the tops and bottoms of columns shown on the plans shall not be eliminated.

The Contractor shall be responsible for determining construction camber and obtaining the final profile grade as shown on the plans.

The Contractor shall reimburse the State for the actual cost of investigating CRIPs for cast-in-place prestressed box girder bridges submitted by the Contractor. The Department will deduct this cost from any moneys due, or that may become due the Contractor under the contract, regardless of whether or not the proposal is approved or rejected.

SLIDING BEARINGS

Sliding bearings consisting of elastomeric bearing pads lubricated with grease and covered with sheet metal shall conform to the following requirements:

A. Grease shall conform to the requirements of Military Specification: MIL-S-8660. A uniform film of grease shall be applied to the upper surface of the pads prior to placing the sheet metal.
B. Sheet metal shall be commercial quality galvanized sheet steel. The sheet metal shall be smooth and free of kinks, bends, or burrs.
C. Construction methods and procedures shall prevent grout or concrete seepage into the sliding bearing assembly.

ELASTOMERIC BEARING PADS

Elastomeric bearing pads shall conform to the provisions in Section 51-1.12H, "Elastomeric Bearing Pads," of the Standard Specifications and these special provisions.

Elastomeric bearing pads at Sutter Creek Bridge (Br No. 26-0040) shall be steel reinforced and shall conform to the provisions in Section 51-1.12H(2) of the Standard Specifications.

DECK CRACK TREATMENT

The Contractor shall use all means necessary to minimize the development of shrinkage cracks.

The Contractor shall remove all equipment and materials from the deck and clean the surface as necessary for the Engineer to measure the surface crack intensity. Surface crack intensity will be determined by the Engineer after completion of concrete cure, prior to prestressing, and prior to the release of falsework. In any 50-m^2 portion of deck within the limits of the new concrete deck, should the intensity of cracking be such that there are more than 5 m of cracks whose width at any location exceeds 0.5-mm, the deck shall be treated with methacrylate resin. The area of deck to be treated shall have a width that extends for the entire width of new deck inside the concrete barriers and a length that extends at least 1.5 m beyond the furthest single continuous crack outside the 50-m^2 portion, measured from where that crack exceeds 0.5-mm in width, as determined by the Engineer.

Deck crack treatment shall consist of test sealing, and furnishing and applying methacrylate resin in conformance with the requirements of these special provisions. If grinding operation is required, deck treatment shall take place after grinding.

Prior to the start of deck treatment work, the Contractor shall submit for approval by the Engineer, a program for public safety associated with the use of methacrylate resin. The program shall identify materials, equipment, and methods to be used. The Contractor shall not perform deck treatment work, other than that specifically authorized in writing by the Engineer, until the program has been approved.

If the measures being taken by the Contractor are inadequate to provide for public safety associated with use of methacrylate resin, the Engineer will direct the Contractor to revise the operations and the public safety program. Directions for revisions will be in writing and will specify the items in which the Contractor's program is inadequate. No further deck treatment shall be performed until public safety measures are adequate, and a revised program for public safety has been approved.

The Engineer will notify the Contractor of the approval or rejection of any submitted or revised program for public safety associated with the use of methacrylate resin within 10 working days of receipt of the final submitted program.

The State will not be liable to the Contractor for failure to approve all or any portion of an originally submitted or revised program for public safety associated with the use of methacrylate resin, nor for any delays to the work due to the Contractor's failure to submit an acceptable program for public safety associated with the use of methacrylate resin. If the Engineer does not review or approve the program submitted by the Contractor within the time specified and if, in the opinion of the Engineer, the Contractor's controlling operation is delayed or interfered with by reason of the delay in reviewing the program for public safety, the delay will be considered a right of way delay in conformance with the provisions in Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

Materials

The material used for treating the deck shall be a high molecular weight methacrylate resin conforming to the following:

PROPERTY	TEST METHOD	REQUIREMENT
Viscosity mPa·s, maximum, (Brookfield RVT with UL adaptor, 50 RPM at 25°C)	ASTM D 2196	0.025
Specific Gravity minimum, at 25°C	ASTM D 1475	0.90
Flash Point °C, minimum	ASTM D 3278	82
Vapor Pressure mm Hg, maximum, at 25°C	ASTM D 323	1.0
Tack-free time minutes, maximum at 25°C	California Test 551	400
PCC Saturated Surface-Dry Bond Strength MPa, minimum at 24 hours and 21±1°C	California Test 551	3.5
* Test shall be performed prior to adding initiator.		

A Material Safety Data Sheet shall be furnished prior to use for each shipment of high molecular weight methacrylate resin.

The promoter and initiator, if supplied separately from the resin, shall not be mixed directly with each other. Containers of promoters and initiators shall not be stored together in a manner that will allow leakage or spillage from one to contact the containers or material of the other.

Testing

The Contractor shall allow 14 days for sampling and testing by the Engineer of the high molecular weight methacrylate resin prior to proposed use.

The Contractor shall treat a test area within the project limits of approximately 50 m^2 at a location approved by the Engineer. Conditions during the test treatment shall be similar to those expected on the deck. Equipment used in the test shall be similar to those used for the deck treating operations. If the test area is on the traveled way, traffic shall not be allowed on the treated test area until (1) the treated surface is tack free (non-oily), (2) the sand cover adheres sufficiently to resist brushing by hand, and (3) the coefficient of friction of the deck is at least 0.35 when tested in conformance with the requirements in California Test 342.

Should the above requirements for traffic use not be met, the Contractor shall suspend treating of bridge decks until another test area is treated and complies with the requirements.

Construction

Prior to deck treatment with methacrylate resin, the bridge deck surface shall be cleaned by abrasive blasting and all loose material shall be blown from visible cracks using high-pressure air. Concrete curing seals shall be cleaned from the deck surface to be treated, and the deck shall be dry when blast cleaning is performed. If the deck surface becomes contaminated at any time prior to placing the penetrating sealer, the deck surface shall be cleaned by abrasive blasting.

Equipment shall be fitted with suitable traps, filters, drip pans, or other devices as necessary to prevent oil or other deleterious material from being deposited on the deck.

Where abrasive blasting is being performed within 3 m of a lane occupied by public traffic, the residue including dust shall be removed immediately after contact between the abrasive and the surface being treated. The removal shall be by a vacuum attachment operating concurrently with the abrasive blasting operation.

The relative humidity shall be less than 90 percent at time of treatment.

A compatible promoter/initiator system shall be capable of providing a resin gel time of not less than 40 minutes nor more than 1.5 hours at the temperature of application. Gel time shall be adjusted to compensate for the changes in temperature throughout treatment application.

The quantity of resin mixed with promoter and initiator shall be limited to 20 L at a time for manual application.

Machine application of the resin shall be performed by using a two-part resin system using a promoted resin for one part and an initiated resin for the other part. This two-part resin system shall be combined at equal volumes to the spray bars through separate positive displacement pumps. Combining of the 2 components shall be by either static in-line mixers or by external intersecting spray fans. The pump pressure at the spray bars shall not be great enough to cause appreciable atomization of the resin. Compressed air shall not be used to produce the spray. A shroud shall be used to enclose the spray bar apparatus. Hand held spray apparatus shall not be used.

The Contractor shall allow methacrylate resin to be applied only to the specified area. Barrier rails, joints, and drainage facilities shall be adequately protected to prevent contamination by the treatment material. Contaminated items shall be repaired at the Contractor's expense.

The prepared area shall be dry and the surface temperature shall be less than or equal to 38°C when the resin is applied. The rate of application of promoted/initiated resin shall be approximately 2.5 square meters per liter, ± 0.1 square meter per liter.

The deck surfaces to be treated shall be flooded with resin, allowing penetration into the concrete and filling of all cracks. The treatment shall be applied within 5 minutes after complete mixing. A significant increase in viscosity shall be cause for rejection. Excess material shall be redistributed by squeegees or brooms within 10 minutes after application.

After the resin has been applied, at least 20 minutes shall elapse before applying sand. The sand shall be commercial quality dry blast sand. Ninety-five percent of the sand shall pass the 2.36-mm sieve, and 95 percent shall be retained on the 850-µm sieve. The sand shall be applied at a rate of one kilogram per square meter, ± 0.1 kilogram per square meter.

Excess sand shall be removed from the deck surface by vacuuming or sweeping prior to opening to traffic.

Traffic shall not be allowed on the treated area until (1) the treated surface is tack free (non-oily), (2) the sand cover adheres sufficiently to resist brushing by hand, and (3) the coefficient of friction of the deck is at least 0.35 when tested in conformance with the requirements in California Test 342.

MEASUREMENT AND PAYMENT

Measurement and payment for concrete in structures shall conform to the provisions in Section 51-1.22, "Measurement," and Section 51-1.23, "Payment," of the Standard Specifications and these special provisions.

Full compensation for deck crack treatment, including a program for public safety, shall be considered as included in the contract price paid per cubic meter for structural concrete (bridge) and no additional compensation will be allowed therefor.

10-1.42 STRUCTURE APPROACH SLABS (Type N)

This work shall consist of constructing reinforced concrete approach slabs, structure approach drainage system, and treated permeable base at structure approaches in conformance with the details shown on the plans, the provisions in Section 51, "Concrete Structures," of the Standard Specifications, and these special provisions.

GENERAL

Attention is directed to "Engineering Fabrics" of these special provisions.

STRUCTURE APPROACH DRAINAGE SYSTEM

Geocomposite Drain

Geocomposite drain shall consist of a manufactured core not less than 6.35 mm thick nor more than 50 mm thick with one or both sides covered with a layer of filter fabric that will provide a drainage void. The drain shall produce a flow rate, through the drainage void, of at least 25 liters per minute per meter of width at a hydraulic gradient of 1.0 and a minimum externally applied pressure of 168 kPa.A Certificate of Compliance conforming to the provisions in Section 6-1.07, "Certificates of Compliance," of the Standard Specifications shall be furnished for the geocomposite drain certifying that the drain produces the required flow rate and complies with these special provisions. The Certificate of Compliance shall be accompanied by a flow capability graph for the geocomposite drain showing flow rates and the externally applied pressures and hydraulic gradients. The flow capability graph shall be stamped with the verification of an independent testing laboratory.

Filter fabric for the geocomposite drain shall conform to the provisions for fabric for underdrains in Section 88, "Engineering Fabrics," of the Standard Specifications.

The manufactured core shall be either a preformed grid of embossed plastic, a mat of random shapes of plastic fibers, a drainage net consisting of a uniform pattern of polymeric strands forming 2 sets of continuous flow channels, or a system of plastic pillars and interconnections forming a semirigid mat.

The core material and filter fabric shall be capable of maintaining the drainage void for the entire height of geocomposite drain. Filter fabric shall be integrally bonded to the side of the core material with the drainage void. Core material manufactured from impermeable plastic sheeting having nonconnecting corrugations shall be placed with the corrugations approximately perpendicular to the drainage collection system.

The geocomposite drain shall be installed with the drainage void and the filter fabric facing the embankment. The fabric facing the embankment side shall overlap a minimum of 75 mm at all joints and wrap around the exterior edges a minimum of 75 mm beyond the exterior edge. If additional fabric is needed to provide overlap at joints and wrap-around at edges, the added fabric shall overlap the fabric on the geocomposite drain at least 150 mm and be attached thereto.

Should the fabric on the geocomposite drain be torn or punctured, the damaged section shall be replaced completely or repaired by placing a piece of fabric that is large enough to cover the damaged area and provide a 150-mm overlap.

Plastic Pipe

Plastic pipe shall conform to the provisions for pipe for edge drains and edge drain outlets in Section 68-3, "Edge Drains," of the Standard Specifications.

Drainage Pads

Concrete for use in drainage pads shall be minor concrete, except the concrete shall contain not less than 300 kilograms of cement per cubic meter.

Treated Permeable Base At Bottom Of Geocomposite Drains

Treated permeable base to be placed around the slotted plastic pipe at the bottom of geocomposite drains shall conform to the provisions in "Treated Permeable Base Under Approach Slabs." If asphalt treated permeable base is used, it shall be placed at a temperature of not less than 82°C nor more than 110°C.

The filter fabric to be placed over the treated permeable base at the bottom of geocomposite drains shall conform to the provisions for filter fabric for edge drains in Section 88, "Engineering Fabrics," of the Standard Specifications.

ENGINEERING FABRICS

Filter fabric to be placed between the structure approach embankment material and the treated permeable base shall conform to the provisions for filter fabric for edge drains in Section 88, "Engineering Fabrics," of the Standard Specifications and these special provisions.

The subgrade to receive the filter fabric, immediately prior to placing, shall conform to the compaction and elevation tolerance specified for the material involved.

Filter fabric shall be aligned, handled, and placed in a wrinkle-free manner in conformance with the manufacturer's recommendations.

Adjacent borders of the filter fabric shall be overlapped from 300 to 450 mm or stitched. The preceding roll shall overlap the following roll in the direction the material is being spread or shall be stitched. When the fabric is joined by stitching, it shall be stitched with yarn of a contrasting color. The size and composition of the yarn shall be as recommended by the fabric manufacturer. The number of stitches per 25 mm of seam shall be 5 to 7.

Equipment or vehicles shall not be operated or driven directly on the filter fabric.

TREATED PERMEABLE BASE UNDER APPROACH SLAB

Treated permeable base under structure approach slabs shall consist of constructing either an asphalt treated permeable base or a cement treated permeable base in accordance with Section 29, "Treated Permeable Bases," of the Standard Specifications and these special provisions.

The type of treatment, asphalt or cement, to be used shall be at the option of the Contractor.

The Contractor shall notify the Engineer in writing, not less than 30 days prior to the start of placing the treated permeable base, which type of treated permeable base will be furnished. Once the Contractor has notified the Engineer of the selection, the type to be furnished shall not be changed without a prior written request to do so and approval thereof in writing by the Engineer.

Asphalt treated permeable base shall be placed at a temperature of not less than 93°C nor more than 121°C. Material stored in excess of 2 hours shall not be used in the work.

Asphalt treated permeable base material may be spread in one layer. The base material shall be compacted with a vibrating shoe type compactor or rolled with a roller weighing at least 1.3 tonnes but no more than 4.5 tonnes. Rolling shall begin as soon as the mixture has cooled sufficiently to support the weight of the rolling equipment without undue displacement.

Cement treated permeable base material may be spread in one layer. The base material shall be compacted with either a vibrating shoe type compactor or with a steel-drum roller weighing at least 1.3 tonnes but no more than 4.5 tonnes. Compaction shall follow within one-half hour after the spreading operation and shall consist of 2 complete coverages of the treated material.

APPROACH SLABS

Concrete for use in approach slabs shall contain not less than 400 kilograms of cementitious material per cubic meter and shall be air-entrained as provided under "Materials" of these special provisions.

Bar reinforcement shall be epoxy-coated and shall conform to the provisions in Section 52-1.02B, "Epoxy-coated Reinforcement" of the Standard Specifications.

The steel angle at the concrete barrier joint shall conform to the provision in Section 75-1.03, "Miscellaneous Metal," of the Standard Specifications.

Structure approach slabs shall be cured for not less than 5 days prior to opening to public traffic, unless, at the option of the Contractor, the structure approach slabs are constructed using concrete with a non-chloride Type C chemical admixture conforming to these special provisions.

Portland cement for use in concrete using a non-chloride Type C chemical admixture shall be Type II Modified, Type II Prestress, or Type III. Type II Modified and Type III cement shall conform to the provisions in Section 90-2.01, "Cement," of the Standard Specifications. Type II Prestress cement shall conform to the requirements of Type II Modified cement, except the mortar containing the portland cement to be used and Ottawa sand, when tested in conformance with California Test 527, shall not contract in air more than 0.053-percent.

The non-chloride Type C chemical admixture, approved by the Engineer, shall conform to the requirements in ASTM Designation: C 494 and Section 90-4, "Admixtures," of the Standard Specifications.

The concrete with non-chloride Type C chemical admixture shall be prequalified prior to placement in conformance with the provisions for prequalification of concrete specified by compressive strength in Section 90-9.01, "General," of the Standard Specifications and the following:

A. Immediately after fabrication of the 5 test cylinders, the cylinders shall be stored in a temperature medium of 21 ± 1.5°C until the cylinders are tested.
B. The 6-hour average strength of the 5 test cylinders shall not be less than 5.85 MPa. No more than 2 test cylinders shall have a strength of less than 5.5 MPa.

Polyvinyl chloride (PVC) conduit used to encase the abutment tie rod shall be of commercial quality.

The top surface of approach slabs shall be finished in conformance with the provisions in Section 51-1.17, "Finishing Bridge Decks," of the Standard Specifications. Edges of slabs shall be edger finished.

Approach slabs shall be cured with pigmented curing compound (1) in conformance with the provisions for curing structures in Section 90-7.01B, "Curing Compound Method," of the Standard Specifications.

Structure approach slabs constructed using concrete with a non-chloride Type C chemical admixture shall be cured for not less than 6 hours prior to opening to public traffic. The curing period shall be considered to begin at the start of discharge of the last truck load of concrete to be used in the slab.

If the ambient temperature is below 18°C during the curing period for approach slabs using concrete with a non-chloride Type C chemical admixture, an insulating layer or blanket shall be used to cover the surface. The insulating layer or blanket shall have an R-value rating given in the table below. At the Contractor's option, a heating tent may be used in lieu of or in combination with the insulating layer or blanket.

Temperature range during curing period	R-value, minimum
13°C to 18°C	1
7°C to 13°C	2
4°C to 7°C	3

MEASUREMENT AND PAYMENT

Structural concrete, approach slab (Type N) will be measured and paid for in conformance with the provisions in Section 51-1.22, "Measurement," and Section 51-1.23, "Payment," of the Standard Specifications and these special provisions.

Full compensation for the structure approach drainage system including geocomposite drain, plastic pipe, drainage pads, treated permeable base, filter fabric, woven tape fabric, miscellaneous metal, pourable seals, epoxy-coated bar reinforcement and epoxy-coated miscellaneous bridge metal shall be considered as included in the contract price paid per cubic meter for structural concrete, approach slab of the type shown in the Engineer's Estimate, and no additional compensation will be allowed therefor.

10-1.43 SEALING JOINTS

Joints in concrete bridge decks and joints between concrete structures and concrete approach slabs shall be sealed in conformance with the details shown on the plans, the provisions in Section 51, "Concrete Structures," of the Standard Specifications, and these special provisions.

When ordered by the Engineer, a joint seal larger than called for by the Movement Rating shown on the plans shall be furnished and installed. Payment to the Contractor for furnishing the larger seal and for saw cutting the increment of additional depth of groove required will be determined as provided in Section 4-1.03, "Changes," of the Standard Specifications.

10-1.44 JOINT SEAL ASSEMBLIES (MOVEMENT RATING EXCEEDING 100 mm)

Joint seal assemblies with movement ratings greater than 100 mm shall consist of a metal frame system, supporting rails and support bars with intervening neoprene glands and shall conform to the details shown on the plans, the provisions in Section 51, "Concrete Structures," of the Standard Specifications and to these special provisions.

Joint seal assemblies will not be considered for approval without satisfactory evidence that the assemblies have had at least one year of satisfactory service under conditions similar to this application.

A qualified representative of the manufacturer shall be present during installation of the first assembly and shall be available for advice during any remaining installations.

The Contractor shall submit complete working drawings for each joint seal assembly to the Division of Structure Design (DSD) in conformance with the provisions in Section 5-1.02, "Plans and Working Drawings," of the Standard Specifications. The working drawings shall show complete details of the joint seal assembly and anchorage components and the method of installation to be followed, including concrete blockout details and any additions or rearrangements of the reinforcing steel from that shown on the plans. For initial review, 5 sets of drawings shall be submitted. After review, between 6 and 12 sets, as requested by the Engineer, shall be submitted to DSD for final approval and use during construction.

The working drawings shall be supplemented with complete calculations for the particular joint seal assembly, when requested by the Engineer. Working drawings shall be either 279 mm x 432 mm or 559 mm x 864 mm in size and each drawing and calculation sheet shall include the State assigned designations for the contract number, bridge number, full name of the structure as shown on the contract plans, and District-County-Route-Kilometer Post. The design firm's name, address, and phone number shall be shown on the working drawings. Each sheet shall be numbered in the lower right hand corner and shall contain a blank space in the upper right hand corner for future contract sheet numbers.

Calculations, when requested, and working drawings shall be stamped and signed by an engineer who is registered as a Civil Engineer. The Contractor shall allow the Engineer 4 weeks to review the drawings after a complete set has been received.

Within 3 weeks after final working drawing approval, one set of the corrected good quality prints on 75-g/m^2 (minimum) bond paper (559 mm x 864 mm in size) of all working drawings prepared by the Contractor for each joint seal assembly shall be furnished to OSD.

Each shipment of joint seal assembly materials shall be accompanied by a Certificate of Compliance in conformance with the provisions in Section 6-l.07, "Certificates of Compliance," of the Standard Specifications. The certificate shall state that the materials and fabrication involved comply in all respects to the specifications and data submitted in obtaining approval.

The neoprene glands shall conform to the requirements in Table 1 of ASTM Designation: D 2628 and the following, except that no recovery tests or compression-deflection tests will be required:

Property	Requirement	ASTM Test Method
Hardness, Type A Durometer, points	55-70	D 2240 (Modified)
Compression set, 70 hours at 100°C, maximum, percent	40	D 395 Method B (Modified)

All metal parts of the joint seal assembly shall conform to the provisions in Section 75-1.03, "Miscellaneous Bridge Metal," of the Standard Specifications. Bolts, nuts and washers shall conform to the requirements of ASTM Designation:

A 325 or A 325M. At the Contractor's option, metal parts may conform to the requirements of ASTM Designation: A 572/A 572M.

At the Contractor's option, cleaning and painting of all new metal surfaces of the joint seal assembly, except stainless steel and anchorages embedded in concrete, may be substituted for galvanizing. Cleaning and painting shall be in conformance with the provisions in Sections 59-2, "Painting Structural Steel," and 91, "Paint," of the Standard Specifications, and "Clean and Paint Structural Steel" of these special provisions.

Certification in conformance with the requirements in SSPC-QP 1, SSPC-QP 2, and SSPC-QP 3 of the "SSPC: The Society for Protective Coatings" will not be required for cleaning and painting joint seal assemblies.

Prior to performing any painting or paint removal, the Contractor shall submit to the Engineer, in conformance with the provisions in Section 5-1.02, "Plans and Working Drawings," of the Standard Specifications, 3 copies of a separate Painting Quality Work Plan (PQWP) for each item of work for which painting or paint removal is to be performed. As a minimum, each PQWP shall include the following:

A. The name of each Contractor or subcontractor to be used.
B. One copy each of all current "SSPC: The Society for Protective Coatings" specifications or qualification procedures which are applicable to the painting or paint removal to be performed. These documents shall become the permanent property of the Department.
C. Proposed methods and equipment to be used for any paint application.

The Engineer shall have 2 weeks to review the PQWP submittal after a complete plan has been received. No painting or paint removal shall be performed until the PQWP for that work is reviewed by the Engineer. Should the Engineer fail to complete the review within this time allowance and if, in the opinion of the Engineer, the Contractor's controlling operation is delayed or interfered with by reason of the delay in reviewing the PQWP, the delay will be considered a right of way delay in conformance with the provisions in Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

CLEANING

Exposed new metal surfaces shall be dry blast cleaned in conformance with the requirements in Surface Preparation Specification No. 10, "Near White Blast Cleaning," of the "SSPC: The Society for Protective Coatings." Blast cleaning shall leave surfaces with a dense, uniform, angular anchor pattern of not less than 40 µm nor more than 86 µm as measured in conformance with the requirements in ASTM Designation: D 4417.

Mineral and slag abrasives used for blast cleaning steel shall conform to the requirements in Abrasive Specification No. 1, "Mineral and Slag Abrasives," of the "SSPC: The Society for Protective Coatings" and shall not contain hazardous material. Mineral and slag abrasives shall comply with the requirements for Class A, Grade 2 to 3 as defined therein.

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

The inside surfaces of bolt holes shall be cleaned in conformance with the requirements in Surface Preparation Specification No. 1, "Solvent Cleaning," of the "SSPC: The Society for Protective Coatings," and visible rust shall be removed.

PAINTING

Blast cleaned surfaces shall receive a single undercoat, and a final coat where specified, consisting of a waterborne inorganic zinc coating conforming to the requirements in AASHTO Designation M 300, Type II, except that: 1) the first 3 sentences of Section 4.7, "Primer Field Performance Requirements," and the entire Section 4.7.1 shall not apply, and 2) zinc dust shall be Type II in conformance with the requirements in ASTM Designation: D 520. The inorganic zinc coating shall be listed on the qualified products list which may be obtained from the Transportation Laboratory.

The inside surfaces of bolt holes shall be painted with one application of a zinc rich primer (organic vehicle type) after the application of the undercoat of inorganic zinc on adjacent steel. The steel surfaces adjacent to the bolt holes shall be kept clean and protected from drippings during the application of the primer.

The color of the final application of inorganic zinc coating shall match Federal Standard 595B No. 36373.

Inorganic zinc coating shall be used within 12 hours of initial mixing.

Application of inorganic zinc coating shall conform to the provisions for applying zinc-rich coating in Section 59-2.13, "Application of Zinc-Rich Primer," of the Standard Specifications.

Inorganic zinc coating shall not be applied when the atmospheric or surface temperature is less than 7°C or more than 29°C, nor when the relative humidity exceeds 85 percent.

The single undercoat of inorganic zinc coating shall be applied to the required dry film thickness in 2 or more applications within 4 hours after blast cleaning.

The total dry film thickness of all applications of the inorganic zinc undercoat, including the surfaces of outside existing members within the grip under bolt heads, nuts and washers, shall be not less than 100 µm nor more than 200 µm.

Areas where mudcracking occurs in the inorganic zinc coating shall be blast cleaned and repainted with inorganic zinc coating to the specified thickness.

Dry spray, or overspray, as defined in the Steel Structures Painting Manual, Volume 1, "Good Painting Practice," of the "SSPC: The Society for Protective Coatings," shall be removed prior to application of subsequent coats or final acceptance. Removal of dry spray shall be by screening or other methods that minimize polishing of the inorganic zinc surface. The dry film thickness of the coating after removal of dry spray shall be in conformance with the provisions for applying the single undercoat, as specified herein.

The inorganic zinc coating shall be tested for adhesion and cure. The locations of the tests will be determined by the Engineer. The sequence of the testing operations shall be determined by the Contractor. The testing for adhesion and cure will be performed no sooner than 72 hours after application of the single undercoat of inorganic zinc coating. At the Contractor's expense, satisfactory access shall be provided to allow the Engineer to determine the location of the tests and to test the inorganic zinc coating cure. The inorganic zinc coating shall pass the following tests:

Adhesion

- The inorganic zinc coating shall have a minimum adhesion to steel of 4 MPa when measured at no more than 6 locations per assembly using a self-aligning adhesion tester in conformance with the requirements in ASTM Designation: D 4541. The Contractor, at the Contractor's expense, shall: (1) verify compliance with the adhesion requirements, (2) furnish test results to the Engineer, and (3) repair the coating after testing.

Cure

- The inorganic zinc coating, when properly cured, shall exhibit a solid, hard, and polished metal surface when firmly scraped with the knurled edge of a quarter. Inorganic zinc coating that is powdery, soft, or does not exhibit a polished metal surface, as determined by the Engineer, shall be repaired by the Contractor, at the Contractor's expense, by blast cleaning and repainting with inorganic zinc coating to the specified thickness.

Finish coats will not be required on joint seal assemblies.

If the assembly consists of more than one component, the design of the assembly shall be such that the external components can be removed and reinstalled at any position, within the larger one-half of the movement rating shown on the plans, to permit the inspection of the internal components of the assembly.

Except for components in contact with the tires, the assembly and its components shall be designed to support the AASHTO HS20-44 loading with 100 percent impact. Each component in contact with the tires shall support a minimum of 80 percent of the AASHTO HS20-44 loading with 100 percent impact. The tire contact area used to distribute the tire loads shall be 244 mm, measured normal to the longitudinal axis of the assembly, by 508 mm wide. The assembly shall provide a smooth riding joint without slapping of components or wheel tire rumble.

The movement rating of the assembly shall be measured normal to the longitudinal axis of the assembly. The dimensions for positioning the assembly within the movement rating during installation shall be measured normal to the longitudinal axis, disregarding any skew of the deck expansion joint. The assembly shall be capable of adjustment to the "a" dimension shown on the plans.

The maximum width of unsupported or yielding components or grooves in the roadway surface of the assembly, measured in the direction of vehicular traffic, shall be 75 mm.

The assembly shall have cast-in-place anchorage components forming a mechanical connection between the joint components and the concrete deck.

The bridge deck surface shall conform to the provisions in Section 51-1.17 "Finishing Bridge Deck," of the Standard Specifications prior to placing joint seal assemblies and anchorage.

The assembly shall be completely shop-assembled and placed in a blocked out recess in the concrete deck surface. The depth and width of the recess shall permit the installation of the assembly anchorage components or anchorage bearing surface to the planned line and grade.

The maximum depth and width of the recess shall be such that the primary reinforcement to provide the necessary strength of the structural members is outside the recess. The maximum width of recess on each side of the expansion joint shall be 500 mm.

All reinforcement other than primary reinforcement shall continue through the recess construction joint into the recess and engage the anchorage components of the assembly.

The vertical expansion joint in barrier shall be available for inspection after placement of the recess concrete around the anchorage components of the assembly.

The assembly shall make a watertight, continuous return 150 mm up into the barrier at the low side of the deck joint. Neoprene glands shall be continuous without field splices or joints, including the return up into barrier.

Full compensation for any additional materials or work required because of the application of the optional cleaning and painting shall be considered as included in the contract price paid per linear meter for the joint seal assembly involved, and no additional compensation will be allowed therefor.

10-1.45 REINFORCEMENT

Reinforcement shall conform to the provisions in Section 52, "Reinforcement," of the Standard Specifications and these special provisions.

Individual hoops, made continuous with butt welded splices, which are substituted for spiral reinforcement, shall conform to the requirements for "Ultimate Butt Splices" of these special provisions.

EPOXY-COATED REINFORCEMENT

All longitudinal and transverse bar reinforcement in bridge decks, all other bar reinforcement within or which extends to within 150 mm of the top surface of the bridge deck, bar reinforcement within or which extends to within 150 mm of the top surface of abutment backwalls, wingwalls, and allbar reinforcement in pile anchors and pipe hanger rods shall be epoxy-coated.

ULTIMATE BUTT SPLICES

Ultimate butt splices shall be either welded or mechanical splices, shall be used at the locations shown on the plans, and shall conform to the provisions in Section 52, "Reinforcement," of the Standard Specifications and these special provisions.

General Requirements

The Contractor shall designate in writing an ultimate butt splicing Quality Control Manager (QCM). The QCM shall be responsible directly to the Contractor for 1) the quality of all ultimate butt splicing including the inspection of materials and workmanship performed by the Contractor and all subcontractors; and 2) submitting, receiving, and approving all correspondence, required submittals, and reports regarding ultimate butt splicing to and from the Engineer.

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

The length of any type of ultimate mechanical butt splice shall not exceed 10 times the bar diameter of the larger bar to be spliced.

All ultimate prejob, production, and job control sample splices shall be 1) a minimum length of 1.5 meters for reinforcing bars No. 25 or smaller and 2 meters for reinforcing bars No. 29 or larger, with the splice located at mid-point, and 2) suitably identified prior to shipment with weatherproof markings that do not interfere with the Engineer's tamper-proof markings or seals. Any splice that shows signs of tampering will be rejected.

A minimum of one control bar shall be removed from the same bar as, and adjacent to, all ultimate prejob, production, and job control sample splices. Control bars shall be 1) a minimum length of one meter for reinforcing bars No. 25 or smaller and 1.5 meters for reinforcing bars No. 29 or larger, and 2) suitably identified prior to shipment with weatherproof markings that do not interfere with the Engineer's tamper-proof markings or seals. The portion of adjacent bar remaining in the work shall also be identified with weatherproof markings that correspond to its adjacent control bar.

Shorter length sample splice and control bars may be furnished if approved in writing by the Engineer.

Each sample splice and its associated control bar shall be identified and marked as a set. Each set shall be identified as representing a prejob, production, or job control sample splice.

The portion of hoop reinforcing bar, removed to obtain a sample splice and control bar, shall be replaced using a prequalified ultimate mechanical butt splice, or the hoop shall be replaced in kind.

Reinforcing bars, other than hoops, from which sample splices are removed, shall be repaired using ultimate mechanical butt splices conforming to the provisions in "Prejob Test Requirements for Ultimate Butt Splices" specified herein, or the bars shall be replaced in kind. These bars shall be repaired or replaced such that no splices are located in the "No Splice Zone" shown on the plans.

Section 52-1.08E, "Job Control Tests," of the Standard Specifications shall not apply.

The provisions for total slip shall not apply to any ultimate splices that are welded or that are used on hoops.

The independent qualified testing laboratory used to perform the testing of all ultimate butt sample splices and control bars shall not be employed or compensated by any subcontractor, or by other persons or entities hired by subcontractors who will provide other services or materials for the project, and shall have the following:

A. Proper facilities, including a tensile testing machine capable of breaking the largest size of reinforcing bar to be tested.
B. A device for measuring the total slip of the reinforcing bars across the splice to the nearest 25 µm, that, when placed parallel to the longitudinal axis of the bar is able to simultaneously measure movement across the splice, at 2 locations, 180 degrees apart.
C. Operators who have received formal training for performing the testing requirements of ASTM Designation: A 370/A 370M and California Test 670.
D. A record of annual calibration of testing equipment performed by an independent third party that has 1) standards that are traceable to the National Institute of Standards and Technology, and 2) a formal reporting procedure, including published test forms.

Ultimate Butt Splice Test Criteria

Ultimate prejob, production, and job control sample splices shall be tensile tested in conformance with the requirements described in ASTM Designation: A 370/A 370M and California Test 670.

Ultimate prejob and production sample splices shall rupture in the reinforcing bar either: 1) outside of the affected zone or 2) within the affected zone, provided that the sample has achieved at least 95 percent of the ultimate tensile strength of the control bar associated with the sample. In addition, necking of the bar shall be visibly evident at rupture regardless of whether the bar breaks inside or outside the affected zone.

The affected zone is the portion of the reinforcing bar where any properties of the bar, including the physical, metallurgical, or material characteristics, have been altered by fabrication or installation of the splice.

The ultimate tensile strength of each control bar shall be determined by tensile testing the bar to rupture and shall be determined for all control bars, regardless of where each sample splice ruptures. If 2 control bars are tested for one sample splice, the bar with the lower ultimate tensile strength shall be considered the control bar.

Testing to determine the minimum tensile strength, in conformance with the provisions in the ninth paragraph of Section 52-1.08, "Splicing," of the Standard Specifications, will not be required.

Prejob Test Requirements for Ultimate Butt Splices

Prior to use in the work, all ultimate butt splices shall conform to the following prejob test requirements:

A. Eight prejob sample splices for each bar size of each splice type including ultimate mechanical butt splices, ultimate complete joint penetration butt welded splices, and ultimate resistance butt welded splices, that will be used in the work, shall be fabricated by the Contractor. For deformation-dependent types of couplers, 8 sample prejob splices shall also be fabricated for each reinforcing bar size and deformation pattern that will be used in the work.
B. The sample splices shall be fabricated using the same splice materials, position, operators, location, and equipment, and following the same procedures as will be used to make the splices in the work
C. At the option of the Contractor, operator qualification tests may be performed simultaneously with the preparation of prejob sample splices.
D. If different diameters of hoops are shown on the plans, prejob sample splices, as described above, will only be required for the smallest hoop diameter. In addition, these splices shall be fabricated using the same radius as shown on the plans for these hoops.
E. Unless otherwise directed in writing by the Engineer, 4 prejob sample splices and control bar sets shall be shipped to the Transportation Laboratory and the remaining 4 sets shall be tested by the Contractor's independent qualified testing laboratory.
F. Each group of 4 sets from a prejob test shall be securely bundled together and identified by location and contract number with weatherproof markings prior to shipment. Bundles containing fewer than 4 sets will not be tested by the Transportation Laboratory, nor shall they be tested by the independent laboratory.
G. All 8 sample splices from each prejob test shall conform to the provisions in "Ultimate Butt Splice Test Criteria" specified herein.
H. Prior to performing any tensile tests on prejob test sample splices, one of the 4 samples shall be tested for, and shall conform to, the provisions for total slip. Should this sample not meet these requirements, one retest, in which the 3 remaining samples are tested for total slip, will be allowed. All 3 of these remaining samples tested shall conform to the aforementioned slip requirements.

I. For each bundle of 4 sets, a Prejob Test Report shall be prepared by the independent testing laboratory performing the testing. The report shall 1) be signed by an engineer who represents the laboratory and is registered as a Civil Engineer in the State of California; 2) include, as a minimum, the following information for each set: contract number, bridge number, bar size, type of splice, length of mechanical splice, physical condition of test sample splice and control bar, any notable defects, limits of affected zone, total measured slip, location of visible necking area, ultimate strength of each splice, ultimate strength and 95 percent of this ultimate strength for each control bar, and a comparison between 95 percent of the ultimate strength of each control bar and the ultimate strength of its associated splice; and 3) be submitted to the QCM for review and approval, and then to the Engineer.

J. Test results for each bundle of 4 sets will be reported in writing to the Contractor within 10 working days after receipt of the bundle by the Transportation Laboratory. In the event that more than one bundle is received on the same day, 2 additional working days shall be allowed for providing test results for each additional bundle received. A test report will be made for each bundle received.

K. Should the Engineer fail to provide the test results within this time allowance and if, in the opinion of the Engineer, the Contractor's controlling operation is delayed or interfered with by reason of the delay in providing the test results, the delay will be considered a right of way delay in conformance with the provisions in Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

Production Test Requirements for Ultimate Butt Splices

Production tests shall be performed for all ultimate butt splices used in the work. A production test shall consist of 4 sets of sample splices and control bars removed from each lot of completed splices, except when quality assurance tests are performed.

A lot of ultimate butt splices is defined as 1) 150, or fraction thereof, of the same type of ultimate mechanical butt splices used for each bar size and each bar deformation pattern that is used in the work or 2) 150, or fraction thereof, of ultimate complete joint penetration butt welded splices, or ultimate resistance butt welded splices for each bar size used in the work. If different diameters of hoop reinforcement are shown on the plans, separate lots shall be used for each different hoop diameter.

After all splices in a lot have been completed, the QCM shall notify the Engineer in writing that all couplers in this lot conform to the specifications and are ready for testing. The sample splices will either be selected by the Engineer at the job site or a fabrication facility, provided the facility is located within an 80-km radius of the jobsite.

After notification has been received, the Engineer will randomly select the 4 sample splices to be removed from the lot and place tamper-proof markings or seals on them. The Contractor or QCM shall select the adjacent control bar for each sample splice bar, and the Engineer will place tamper-proof markings or seals on them. These ultimate production sample splices and control bars shall be removed by the Contractor, and tested by an independent qualified testing laboratory, in the presence of either the Engineer or the Engineer's authorized representative.

The Engineer or the Engineer's authorized representative will be at the independent qualified testing laboratory within a maximum of 5 working days after receiving written notification that the samples are at the laboratory and ready for testing. Should the Engineer or the Engineer's authorized representative fail to be at the laboratory within this time allowance, and if, in the opinion of the Engineer, the Contractor's controlling operation is delayed or interfered with by reason of this action, the delay will be considered a right of way delay in conformance with the provisions in Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

A sample splice or control bar from any set will be rejected if any tamper-proof marking or seal is disturbed prior to testing.

The 4 sets from each production test shall be securely bundled together and identified with a completed sample identification card prior to shipment to the independent laboratory. The card will be furnished by the Engineer. Bundles of samples containing fewer than 4 sets of splices shall not be tested.

A Production Test Report for all testing performed on each lot shall be prepared by the independent testing laboratory performing the testing and submitted to the QCM for review and approval. The report shall be signed by an engineer who represents the laboratory and is registered as a Civil Engineer in the State of California. The report shall include, as a minimum, the following information for each set: contract number, bridge number, lot number and location, bar size, type of splice, length of mechanical splice, physical condition of test sample splice and control bar, any notable defects, limits of affected zone, total measured slip, location of visible necking area, ultimate strength of each splice, ultimate strength and 95 percent of this ultimate strength for each control bar, and a comparison between 95 percent of the ultimate strength of each control bar and the ultimate strength of its associated splice.

The QCM must review, approve, and forward each Production Test Report to the Engineer for review before any splices represented by the report are encased in concrete. The Engineer shall have 3 working days to review each Production Test Report and respond in writing after a complete report has been received. Should the Contractor elect to encase any splices prior to receiving notification from the Engineer, it is expressly understood that the Contractor will not be relieved of the

Contractor's responsibility for incorporating material in the work that conforms to the requirements of the plans and specifications. Any material not conforming to these requirements will be subject to rejection. Should the Contractor elect to wait to encase any splices pending notification by the Engineer, and should the Engineer fail to complete the review and provide notification within this time allowance, and if, in the opinion of the Engineer, the Contractor's controlling operation is delayed or interfered with by reason of the delay in notification, the delay will be considered a right of way delay in conformance with the provisions in Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

Prior to performing any tensile tests on production test sample splices, one of the 4 samples shall be tested for, and shall conform to, the provisions for total slip. Should this sample not meet these requirements, one retest, in which the 3 remaining samples are tested for total slip, will be allowed. Should any of the 3 remaining samples not conform to these requirements, all splices in the lot represented by this production test will be rejected.

If 3 or more sample splices from any production test conform to the provisions in "Ultimate Butt Splice Test Criteria" specified herein, all splices in the lot represented by this production test will be considered acceptable.

Should only 2 sample splices from any production test conform to the provisions in "Ultimate Butt Splice Test Criteria" specified herein, one additional production test shall be performed on the same lot of splices. Should any of the 4 sample splices from this additional test fail to conform to these provisions, all splices in the lot represented by these production tests will be rejected.

If only one sample splice from any production test conforms to the provisions in "Ultimate Butt Splice Test Criteria" specified herein, all splices in the lot represented by this production test will be rejected.

If a production test for any lot fails, the Contractor will be required to repair or replace all reinforcing bars from which sample splices were removed, complete in place, before the Engineer selects any additional splices from this lot for further testing.

Whenever any lot of ultimate butt splices is rejected, additional ultimate butt splices shall not be used in the work until 1) the QCM performs a complete review of the Contractor's quality control process for these splices, 2) a written report is submitted to the Engineer describing the cause of failure for the splices in this lot and provisions for correcting these failures in future lots, and 3) the Engineer has provided the Contractor with written notification that the report is acceptable. The Engineer shall have 3 working days after receipt of the report to provide notification to the Contractor. Should the Engineer not provide notification within this time allowance, and if, in the opinion of the Engineer, the Contractor's controlling operation is delayed or interfered with by reason of this action, the delay will be considered a right of way delay in conformance with the provisions in Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

Production tests will not be required on any repaired splice from a lot, regardless of the type of prequalified ultimate mechanical butt splice used to make the repair.

Should an additional production test be required, the Engineer may select any repaired splice for use in the additional production test.

Quality Assurance Test Requirements for Ultimate Butt Splices

For the first production test performed, and for at least one, randomly selected by the Engineer, of every 5 additional production tests, or portion thereof, performed thereafter, the Contractor shall concurrently prepare 4 additional ultimate job control sample splices along with associated control bars. These ultimate job control samples shall be prepared in the same manner as specified herein for ultimate prejob sample splices and control bars.

Each time 4 additional ultimate job control sample splices are prepared, 2 of these job control sample splice and associated control bar sets and 2 of the production sample splice and associated control bar sets, together, shall conform to the requirements for ultimate production sample splices in "Production Test Requirements for Ultimate Butt Splices" specified herein.

The 2 remaining job control sample splice and associated control bar sets, along with the 2 remaining production sample splice and associated control bar sets shall be shipped, unless otherwise directed in writing by the Engineer, to the Transportation Laboratory for quality assurance testing. The 4 sets shall be securely bundled together and identified by location and contract number with weatherproof markings prior to shipment. Bundles containing fewer than 4 sets will not be tested.

Quality assurance testing will be performed in conformance with the requirements for ultimate production sample splices in "Production Test Requirements for Ultimate Butt Splices" specified herein.

Test results for each bundle of 4 sets will be reported in writing to the Contractor within 3 working days after receipt of the bundle by Transportation Laboratory. In the event that more than one bundle is received on the same day, 2 additional working days shall be allowed for providing test results for each additional bundle received. A test report will be made for each bundle received. Should the Contractor elect to encase any splices prior to receiving notification from the Engineer, it is expressly understood that the Contractor will not be relieved of the Contractor's responsibility for incorporating material in the work that conforms to the requirements of the plans and specifications. Any material not conforming to these requirements will be subject to rejection. Should the Contractor elect to wait to encase any splices pending notification by

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

MEASUREMENT AND PAYMENT

Measurement and payment for reinforcement in structures shall conform to the provisions in Section 52-1.10, "Measurement," and Section 52-1.11, "Payment," of the Standard Specifications and these special provisions.

Full compensation for conforming to the provisions of "Ultimate Butt Splices," of 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.

10-1.46 STEEL STRUCTURES

GENERAL

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

METRIC SIZE SHOWN ON THE PLANS	SIZE TO BE SUBSTITUTED
ASTM Designation: A 325M (Nominal bolt diameter (mm or mm x thread pitch))	ASTM Designation: A 325 (Nominal bolt diameter (inch))
13 or 12.70, M12, M12 x 1.75	1/2
16 or 15.88, M16, M16 x 2	5/8
19 or 19.05, M20, M20 x 2.5	3/4
22 or 22.22, M22, M22 x 2.5	7/8
24, 25, or 25.40, M24, M24 x 3	1
29 or 28.58, M27, M24 x 3	1 1/8
32 or 31.75, M30, M30 x 3.5	1 1/4
38 or 38.10, M36, M36 x 4	1 1/2

MATERIALS

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

At the option of the Contractor, check samples may be removed at the rolling mill rather than at the point of fabrication. The sample will be removed from the mill plate that will be stripped by the fabricator to produce the designated plate and may be taken from any location within that plate. The mill plate from which samples are removed shall be marked with the same identifying numbers as are used on the samples.

ROTATIONAL CAPACITY TESTING PRIOR TO SHIPMENT TO JOB SITE

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

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

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

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

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

A. Long Bolt Test Equipment:

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

B Long Bolt Test Procedure:

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

Table A

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

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

Table B

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

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

6. Turn the nut to achieve the applicable minimum bolt tension value listed in Table C. After reaching this tension, record the moving torque, in foot-pounds, required to turn the nut, and also record the corresponding bolt tension value in pounds. Torque shall be measured with the nut in motion. Calculate the value, T (in ft-lbs), where T=[(the measured tension in pounds) x (the bolt diameter in inches) / 48 in/ft].

Table C

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

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

C. Long Bolt Acceptance Criteria:

1. An assembly shall pass the following requirements to be acceptable: 1) the measured moving torque (Step 6) shall be less than or equal to the calculated value, T (Step 6), 2) the bolt tension measured in Step 7 shall be

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

Table D

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

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

A. Short Bolt Test Equipment:

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

B. Short Bolt Test Procedure:

1. Measure the bolt length. The bolt length is defined as the distance from the end of the threaded portion of the shank to the underside of the bolt head.
2. Install the nut on the bolt so that 3 to 5 full threads of the bolt are located between the bearing face of the nut and the underside of the bolt head. Measure and record the thread stickout of the bolt. Thread stickout is determined by measuring the distance from the outer face of the nut to the end of the threaded portion of the shank.
3. Install the bolt into a hole on the plate or girder and install the required number of washers and additional spacers as needed between the bearing face of the nut and the underside of the bolt head to produce the thread stickout measured in Step 2 of this procedure.
4. Tighten the nut using a hand wrench to a snug-tight condition. The snug condition shall be the full manual effort applied to the end of a 305 mm long wrench. This applied torque shall not exceed 20 percent of the maximum allowable torque in Table E.

Table E

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

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

Table F

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

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

Table G

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

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

C. Short Bolt Acceptance Criteria:

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

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

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

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

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

At the Contractor's expense, additional installation tension tests, tests required to determine job inspecting torque, and rotational capacity tests shall be performed by the Contractor on each rotational capacity lot, in the presence of the Engineer, if 1) any fastener is not used within 3 months after arrival on the jobsite, 2) fasteners are improperly handled, stored, or subjected to inclement weather prior to final tightening, 3) significant changes are noted in original surface condition of threads, washers, or nut lubricant, or 4) the Contractor's required inspection is not performed within 48 hours after all fasteners in a joint have been tensioned.

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

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

SURFACE PREPARATION

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

SEALING

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

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

10-1.47 ROADSIDE SIGNS

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

Wood posts shall be pressure treated after fabrication in conformance with the provisions in Section 58, "Preservative Treatment of Lumber, Timber and Piling," of the Standard Specifications with creosote, creosote coal tar solution, creosote petroleum solution (50-50), pentachlorophenol in hydrocarbon solvent, copper naphthenate, ammoniacal copper arsenate, or ammoniacal copper zinc arsenate. In addition to the preservatives listed above, Southern yellow pine may also be pressure

treated with chromated copper arsenate. When other than one of the creosote processes is used, blocks shall have a minimum retention of 6.4 kg/m^3, and need not be incised.

10-1.48 ALTERNATIVE PIPE

Alternative pipe culverts shall conform to the provisions in Section 62, "Alternative Culverts," of the Standard Specifications.

10-1.49 REINFORCED CONCRETE PIPE

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

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

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

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

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

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

The Outer Bedding shown on Revised Standard Plan A62DA shall not be compacted prior to placement of the pipe.

10-1.50 CORRUGATED METAL PIPE

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

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

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

Corrugated steel pipes shown on the plans to be plugged shall be securely closed by a tight fitting plug, or by a tight brick wall not less than 200-mm thick with cement mortar joints. Plug shall be constructed or fitted as soon as the pipe is installed to prevent entrance of any materials.

The material used for plugging shall be approved by the Engineer.

Full compensation for pipe plugs shall be considered as included in the contract unit price paid per meter for corrugated steel pipe and no additional compensation will allowed therefor.

10-1.51 ALTERNATIVE PIPE UNDERDRAIN

Alternative pipe underdrains shall conform to the provisions in Section 68-1, "Underdrains," of the Standard Specifications for the kind of alternative pipe underdrain installed.

Permeable material for alternative pipe underdrains shall be Class 2 .

10-1.52 ROCK DRAIN

Rock drain shall be constructed in conformance with the details shown on the plans and these special provisions.

Alternative pipe for use in underdrain shall conform to the material requirements in Section 68-1, "Underdrains," of the Standard Specifications for the kind of alternative pipe underdrain installed.

Permeable material shall conform to the provisions in Section 68-1, "Underdrains," of the Standard Specifications except for payment.Permeable materials shall be Class 3 and have a durability index of not less than 40. The percentage of composition by weight of material, in place, shall conform to the following gradings:

Grading Requirements

Sieve Sizes	Percentage Passing
50-mm	100
25 to 12.5-mm	95-100
# 4	0-5

Filter fabric for use in rock drain shall conform to Section 88, "Engineering Fabrics", of the Standard Specifications and the provisions for filter fabric elsewhere in these special provisions.

Care should be taken to prevent cave-in of materials into excavation.

The contract unit price paid for rock drain shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all the work involved in constructing rock drain, complete in place, including structure excavation, structure backfill, 150 mm perforated alternative pipe underdrain, permeable material, and filter fabric, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

10-1.53 EDGE DRAIN

Edge drains shall conform to the provisions in Section 68-3, "Edge Drains," of the Standard Specifications.

10-1.54 PERMEABLE MATERIAL (BLANKET)

Permeable material blanket shall be constructed in conformance with the details shown on the plans and these special provisions.

Permeable material for permeable material blanket shall be Class 2 and shall conform to the provisions in Section 68-1, "Underdrains," of the Standard Specifications, except for payment.

Filter fabric for use with permeable material blanket shall conform to the provisions for filter fabric for underdrain trenches in Section 88, "Engineering Fabrics," of the Standard Specifications and the following:

A. The subgrade to receive the filter fabric, immediately prior to placing, shall conform to the compaction and elevation tolerance specified for the material involved.
B. Filter fabric shall be handled and placed in conformance with the manufacturer's recommendations.
C. The fabric shall be aligned and placed in a wrinkle-free manner.
D. Adjacent borders of the fabric shall be overlapped from 300 mm to 450 mm or stitched. The preceding roll shall overlap the following roll in the direction the material is being spread or shall be stitched. When the fabric is joined by stitching, the fabric shall be stitched with yarn of a contrasting color. The size and composition of the yarn shall be as recommended by the fabric manufacturer. The stitches shall number 5 to 7 per 25 mm of seam.
E. Within 24 hours after the filter fabric has been placed, the fabric shall be covered with the planned thickness of permeable material or aggregate subbase material as shown on the plans.
F. During spreading and compaction of the permeable material and aggregate subbase material, a minimum of 150 mm of the material shall be maintained between the fabric and the Contractor's equipment. Where embankment material is to be placed on the filter fabric, a minimum of 450 mm of embankment material shall be maintained between the fabric and the Contractor's equipment. Equipment or vehicles shall not be operated or driven directly on the filter fabric.

Class 2 permeable material (blanket) will be measured by the cubic meter. Quantities of permeable material to be paid for as class 2 permeable material (blanket) will be determined from the dimensions shown on the plans or such other dimensions as may be ordered in writing by the Engineer. Permeable material blanket constructed in excess of these dimensions will not be paid for.

The contract price paid per cubic meter for class 2 permeable material (blanket) shall include full compensation for furnishing all labor, materials (including filter fabric), tools, equipment, and incidentals, and for doing all the work involved in constructing a permeable material (blanket) and placing filter fabric, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

10-1.55 OVERSIDE DRAIN

Slip joints, metal pipe downdrain anchor assemblies, and alternative pipe downdrains shall conform to the provisions in Section 69, "Overside Drains," of the Standard Specifications.

10-1.56 OVERSIDE DRAIN

Asphalt concrete overside drains shall conform to the provisions in Section 69, "Overside Drains," of the Standard Specifications.

10-1.57 MISCELLANEOUS FACILITIES

Alternative pipe inlets and alternative flared end sections shall conform to the provisions in Section 70, "Miscellaneous Facilities," of the Standard Specifications and these special provisions.

Portland cement concrete for the 900 mm alternative pipe inlet base shall be produced from commercial quality aggregate and cement and shall contain not less than 350 kilograms of cement per cubic meter.

Full compensation for the pipe inlet concrete base shall be considered as included in the contract price paid per meter for 900 mm alternative pipe inlet and no separate payment will be made therefor.

10-1.58 SLOPE PROTECTION

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

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

10-1.59 MISCELLANEOUS CONCRETE CONSTRUCTION

Minor concrete (curb and sidewalk) shall conform to the provisions in Section 73, "Concrete Curbs and Sidewalks," of the Standard Specifications and these special provisions.

Curb ramp detectable warning surface shall consist of raised truncated domes constructed or installed on curb ramps in conformance with the details shown on the plans and these special provisions. At the option of the Contractor, the detectable warning surface shall be prefabricated, cast-in-place, or stamped into the surface of the curb ramp. The color of the detectable warning surface shall be yellow conforming to Federal Standard 595B, Color No. 33538.

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

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

The finished surfaces of the detectable warning surface shall be free from blemishes.

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

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

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

10-1.60 MISCELLANEOUS IRON AND STEEL

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

10-1.61 MISCELLANEOUS METAL (BRIDGE)

Miscellaneous metal (bridge) shall conform to the provisions for miscellaneous bridge metal in Section 75, "Miscellaneous Metal," of the Standard Specifications and these special provisions.

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

A. Expansion assembly and hardware for deck drainage piping
B. Pipe hanger assembly and hardware

Self-tapping screws used for sleeve connections shall be hex-head stainless steel, installed in holes drilled to fit the self-tapping screws, conforming to the requirements of ASTM Designation: A 276, Type 316.

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

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

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

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

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

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

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

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

Cast-in-place inserts shall be the ferrule loop type.

Metal parts of concrete anchorage devices shall be fabricated from stainless steel conforming to the requirements of ASTM Designation: A 276, Type 316.

10-1.62 TYPE WM FENCE

Type WM fence shall conform to the provisions in Section 80, "Fences," of the Standard Specifications and these special provisions.

The fence material shall be fastened to metal posts.

10-1.63 MARKERS AND DELINEATORS

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

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

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

10-1.64 METAL BEAM GUARD RAILING

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

Attention is directed to "Order of Work" of these special provisions.

TERMINAL SYSTEM (TYPE SRT)

Terminal system (Type SRT) shall be furnished and installed as shown on the plans and in conformance with these special provisions.

Terminal system (Type SRT) shall be a SRT-350 Slotted Rail Terminal (8 post system) as manufactured by Trinity Industries, Inc., and shall include all the items detailed for terminal system (Type SRT) shown on the plans.

The 5 mm x 44 mm x 75 mm plate washer shown on the elevation view and in Section D-D at Wood Post No. 1 shall be omitted.

Arrangements have been made to insure that any successful bidder can obtain the SRT-350 Slotted Rail Terminal (8 post system) from the manufacturer, Trinity Industries, Inc., P.O. Box 99, 950 West 400S, Centerville, UT 84014, Telephone 1-800-772-7976. The price quoted by the manufacturer for the SRT-350 Slotted Rail Terminal (8 post system), FOB Centerville, Utah is $845.00, not including sales tax.

The above price will be firm for orders placed on or before December 31, 2003, provided delivery is accepted within 90 days after the order is placed.

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

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

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

10-1.65 CHAIN LINK RAILING

Chain link railing shall conform to the provisions in Section 83-l, "Railings," of the Standard Specifications.

10-1.66 CONCRETE BARRIER

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

Concrete for use in concrete barriers shall contain not less than 400 kg of cementitious material per cubic meter and shall be air-entrained concrete in conformance with the provisions in "Materials" of these special provisions.

Bar reinforcing steel for use in concrete barriers shall conform to the provisions in Section 52-1.02B, "Epoxy-coated Reinforcement," of the Standard Specifications.

COLORED CONCRETE

Colored concrete shall conform to the provisions in Section 51, "Concrete Structures," and Section 90, "Portland Cement Concrete," of the Standard Specifications and these special provisions.

The color of concrete barrier at Sutter Creek Bridge (Br. No. 26-0040) and Amador Creek Bridge (Br. No. 26-0043) shall be integrally pigmented colored concrete. The color shall conform to Color No.30340 of Federal Standard 595B.

Color pigments shall be of high quality iron oxides conforming to ASTM C979, "Standard Specification for Pigments for Integrally Colored Concrete." The manufacturer of the color pigments shall specify the dosage rate for achieving the specified color. The dosage shall not exceed 10 percent by weight of cementitious materials in the concrete mix design.

The Contractor shall submit technical data and manufacturer's specifications for colored concrete components and a proposed plan for mixing, delivery, placement, finishing, and curing of the colored concrete. This plan shall be submitted to the Engineer for approval at least 15 days prior to constructing the test panel as specified herein.

At the Contractor's option air-entraining admixtures may be used in conformance with Section 90-4.07, "Optional Use of Air-entraining Admixtures," of the Standard Specifications.

In addition to the requirements for the use of admixtures in Section 90-4, "Admixtures," of the Standard Specifications and these special provisions, admixtures used in colored concrete shall be certified by both the color additive manufacturer and the concrete supplier. The Contractor shall submit these written certifications to the Engineer at least 15 days prior to constructing the test panel.

Test Panel

A test panel of at least 1.25 meters x 1.25 meters in size, with a depth of 150 mm, shall be successfully completed, at a location approved by the Engineer, at least 30 days before placing colored concrete. The test panel shall be constructed,

finished, and cured with the same materials, tools, equipment, and methods that will be used in placing the colored concrete. At the completion of the curing period, the test panel shall exhibit a color that closely matches the specified color. If ordered by the Engineer, additional test panels shall be constructed, finished, and cured until the specified color is obtained.

The approved test panel shall be the standard of comparison in determining the acceptability of colored concrete. Upon successful completion of all colored concrete, all test panels shall become property of the Contractor and shall be disposed of in conformance with the provisions in Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications.

Samples of cementitious materials and aggregates used in the approved test panel shall be retained. Cementitious materials and aggregates from the same sources used in the approved test panel shall be used for the colored concrete and sampled in conformance with California Test 201 for comparison of color and gradation with the material used for the approved test panel.

Construction

The Contractor shall monitor the water content, weight of cement, and size, weight, and color of aggregate to maintain consistency and accuracy of the mixed colored concrete. The Contractor shall schedule delivery of concrete to provide consistent mix times from batching until discharge. No water shall be added after a portion of the batch has been discharged.

When more than one concrete pump is used to place concrete, the Contractor shall designate which pumps shall receive colored concrete. The designated pumps shall receive only colored concrete throughout the concrete placement operation.

Consistent finishing practices shall be used to ensure uniformity of texture and color. Surrounding exposed surfaces shall be protected from discoloring during placement and finishing operations of colored concrete.

Unless otherwise specified, curing of colored concrete shall be by the forms-in-place method or the curing compound method only and shall conform to Section 90-7.03, "Curing Structures," of the Standard Specifications and these special provisions. The curing compound used for curing colored concrete surfaces shall be clear or match the color of the colored concrete and shall be manufactured specifically for colored concrete. Curing compounds containing calcium chloride shall not be used. Curing compound shall be applied at a consistent time period after concrete finishing operations. Surrounding exposed surfaces shall be protected from discoloring during curing operations of colored concrete.

Full compensation for colored concrete shall be considered as included in the contract price paid per meter for concrete barrier of the type or types listed in the Engineer's Estimate and no separate payment will be made therefor.

Full compensation for epoxy-coated bar reinforcement shall be considered as included in the contract price paid per meter for concrete barrier of the type or types listed in the Engineer's Estimate and no separate payment will be made therefor.

10-1.67 THERMOPLASTIC PAVEMENT MARKING

Thermoplastic pavement markings shall be applied in conformance with the provisions in Section 84, "Traffic Stripes and Pavement Markings," of the Standard Specifications and these special provisions.

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

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

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

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

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

10-1.68 THERMOPLASTIC TRAFFIC STRIPE (SPRAYABLE)

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

Sprayable thermoplastic material shall conform to the requirements of the Department of Transportation Specification PTH 392B, for Thermoplastic Traffic Striping Material, Sprayable, White and Yellow.

Sprayable thermoplastic material for traffic stripes shall be applied by spray methods in a single uniform layer at the minimum thickness of 1.0-mm.

Sprayable thermoplastic material shall be applied to the pavement at a temperature between 177°C and 205°C, unless a different temperature is recommended by the manufacturer.

At the option of the Contractor, permanent traffic striping and pavement marking tape conforming to the provisions in "Prequalified and Tested Signing and Delineation Materials" of these special provisions may be placed instead of the sprayable thermoplastic traffic stripes specified herein. Permanent tape, if used, shall be installed in conformance with the manufacturer's specifications. If permanent tape is placed instead of sprayable thermoplastic traffic stripes, the tape will be measured and paid for by the meter as thermoplastic traffic stripe (sprayable).

Sprayable thermoplastic traffic stripes will be measured by the meter along the line of the traffic stripes, without deductions for gaps in broken traffic stripes. A double traffic stripe, consisting of two, 100 mm wide yellow stripes will be measured as one traffic stripe.

The contract price paid per meter for thermoplastic traffic stripe (sprayable) shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all the work involved in applying sprayable thermoplastic traffic stripes (regardless of the number, widths, and patterns of individual stripes involved in each traffic stripe) including establishing alignment for stripes, and layout work, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

10-1.69 PROFILED THERMOPLASTIC TRAFFIC STRIPE

Profiled thermoplastic traffic stripe (traffic lines) shall conform to the provisions in Section 84, "Traffic Stripes and Pavement Markings," of the Standard Specifications and these special provisions.

Profiled thermoplastic material shall conform to the requirements of State Specification PTH 499A.

Profiled thermoplastic traffic stripe shall be inverted profile or raised and inverted profile, as designated on the plans.

During application of the thermoplastic material, the pavement shall be clean and completely dry, the temperature of the pavement shall be between 16°C and 60°C, and the temperature of the thermoplastic material shall be as recommended by the manufacturer. A primer of the type recommended by the thermoplastic manufacturer shall be applied whenever the pavement temperature is below 22°C and also when applying inverted profile thermoplastic to portland cement concrete pavements, asphalt concrete pavements over 6 months old, or over existing striping.

The thermoplastic material shall be applied at a minimum thickness of 2.8 mm before being profiled. The viscosity and thixotropy of the applied thermoplastic shall be such that the thermoplastic line shall retain its profile height and shape, and shall not flow or flatten while cooling or when bearing traffic.

Glass beads shall be applied to the surface of the molten thermoplastic material in 2 equal applications at a combined total rate of not less than 70 kg of glass beads per kilometer of 100 mm wide solid stripe.

At least 14 days prior to the scheduled start of production of profiled thermoplastic, the Contractor shall submit a written Quality Control Plan to the Engineer. At the request of the Engineer or the Contractor, the Contractor shall discuss details of the Quality Control Plan with the Engineer. The Engineer shall review and approve the Quality Control Plan in writing, prior to the placement of the test stripe.

The Quality Control Plan shall describe the organization and procedures that will be used to administer the quality control system, including the procedures used to control the production process, the procedures used to determine when changes to the production process are needed, and the procedures proposed to be used to implement the required changes.

Profiled thermoplastic production and placement shall not begin until the Engineer approves the Quality Control Plan in writing. Approval of the Quality Control Plan does not imply a warranty by the Engineer that adherence to the plan will result in production of acceptable profiled thermoplastic. It shall remain the responsibility of the Contractor to demonstrate such compliance.

The Quality Control Plan shall include the name and qualifications of a Quality Control Manager, experienced with the equipment, materials, and application of profiled thermoplastic traffic striping. The Quality Control Manager shall be responsible for the administration of the Quality Control Plan, including compliance with the plan and plan modifications. The Quality Control Manager shall be responsible to the Contractor and shall have the authority to make decisions concerning the quality of the work or product. Except in cases of emergency and with the written approval of the Engineer, the Quality Control Manager cannot be a foreman, member of the production or striping crew, an inspector, or tester on the project during stripe production and placement.

The Quality Control Plan may be modified as work progresses. A supplement shall be submitted in writing to the Engineer whenever there are changes to quality control procedures or personnel. Profiled thermoplastic production and placement shall not resume or continue until the Engineer approves the revisions to the Quality Control Plan in writing.

Prior to application, and in the presence of the Quality Control Manager, the Contractor shall place a test stripe on roofing felt or other suitable material to demonstrate the Contractor's abilities to apply a stripe with the desired profile for a minimum length of 15 meters. The Contractor shall not place striping material on the roadway without the approval of the Engineer. The Engineer shall require the Contractor to delay installation of the material if, in the opinion of the Engineer, the Contractor does not have suitable equipment or skills to place the striping materials in a suitable manner. If the

Contractor's initial test stripe is not approved, the Quality Control Manager shall work with the Contractor to perform the necessary training and adjustments to repeat the test stripe application to the satisfaction of the Engineer.

The Contractor shall provide a profile template or profile height gauge to the Engineer during application and inspection of the thermoplastic striping to determine if the applied thermoplastic line is profiled to match the plans.

The Quality Control Manager shall be present during placement of the test stripe, the initial application, the final application, and at selected intervals as outlined in the Quality Control Plan. The Quality Control Manager shall immediately alert the Contractor and the Engineer to anything that could affect the performance of the product. The Quality Control Manager shall ensure that materials are placed in conformance with accepted procedures.

Profiled thermoplastic traffic stripe will be measured and paid for in the same manner specified for thermoplastic traffic stripe in Section 84-2, "Thermoplastic Traffic Stripes and Pavement Markings," of the Standard Specifications.

10-1.70 PAVEMENT MARKERS

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

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

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

SECTION 10-2. (BLANK)

SECTION 10-3. SIGNALS, LIGHTING AND ELECTRICAL SYSTEMS

10-3.01 DESCRIPTION

Traffic signals and lighting, highway lighting and modifying signal shall conform to the provisions in Section 86, "Signals, Lighting and Electrical Systems," of the Standard Specifications and these special provisions.

Traffic signal work shall be performed at the following locations:

A. Route 49 / Ridge Road (modify signal)
B. Route 49 / Valley View Road (signal and lighting)

10-3.02 COST BREAK-DOWN

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

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

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

10-3.03 MAINTAINING EXISTING AND TEMPORARY ELECTRICAL SYSTEMS

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

10-3.04 SIGNAL MOUNTING ASSEMBLIES

Pipe fittings shall be galvanized steel or bronze. Mast arm slip-fitters, post-top slip-fitters and terminal compartments shall be cast bronze.

10-3.05 FOUNDATIONS

Reinforced cast-in-drilled-hole concrete pile foundations for Lighting standard and Closed Circuit Television System, standards shall conform to the provisions in "Piling" of the Standard Specifications.

10-3.06 STANDARDS, STEEL PEDESTALS AND POSTS

Standards, steel pedestals and posts for traffic signal and lighting standards shall conform to the provisions in "Steel Structures" of these special provisions.

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

The sign panels will be State-furnished in conformance with the provisions in "Materials" of these special provisions.

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

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

10-3.07 CONDUIT

Conduit to be installed underground shall be Type 3 unless otherwise specified. Detector termination conduits shall be Type 3.

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 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.

Conduit runs shown on the plans to be located behind curbs may be installed in the street, within 0.9-m of, and parallel with the face of the curb, by the "Trenching in Pavement Method" in conformance with the provisions in Section 86-2.05C, "Installation," of the Standard Specifications. Pull boxes shall be located behind the curb or at the locations shown on the plans.

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

10-3.08 CONDUCTORS AND WIRING

Splices shall be insulated by "Method B" or, at the Contractor's option, splices of conductors shall be insulated with heat-shrink tubing of the appropriate size after thoroughly painting the spliced conductors with electrical insulating coating.

The minimum insulation thickness, at any point, for Type USE, RHH or RHW wire shall be 1.0 mm for conductor sizes No. 14 to No. 10, inclusive, and 1.3 mm for No. 8 to No. 2, inclusive. The minimum insulation thickness, at any point, for Type THW and TW wires shall be 0.69 mm for conductor sizes No. 14 to No. 10, inclusive, 1.02 mm for No. 8, and 1.37 mm for No. 6 to No. 2, inclusive.

All conductors shall be Type THW.

SIGNAL INTERCONNECT CABLE.

Signal Interconnect Cable (SIC) shall be the 3-pair type.

10-3.09 BONDING AND GROUNDING

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

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

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

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

Equipment bonding and grounding conductors are required in conduits, except when the conduits contain combinations of loop lead-in cable, fiber optic cable, or signal interconnect cable. A No. 8 minimum, bare copper wire shall run continuously in circuits, except for series lighting circuits, where No. 6 bare copper wire shall run continuously. The bonding wire size shall be increased to match the circuit breaker size in conformance with the Code, or shall be as shown on the plans. Conduits to be installed for future conductors, may omit the copper wire.

10-3.10 SERVICE

Type III service equipment enclosures shall be the aluminum type.

Circuit breakers shall be the cable-in/cable-out type, mounted on non-energized clips. All circuit breakers shall be mounted vertically with the up position of the handle being the "ON" position.

10-3.11 NUMBERING ELECTRICAL EQUIPMENT

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

10-3.12 STATE-FURNISHED CONTROLLER ASSEMBLIES

The Model 170 controller assemblies, including controller unit, completely wired controller cabinet and inductive loop detector sensor units, but without anchor bolts, will be State-furnished as provided under "Materials" of these special provisions.

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

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

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

10-3.13 VEHICLE SIGNAL FACES AND SIGNAL HEADS

Light emitting diode signal modules for vehicular traffic signal units will be State-furnished in conformance with the provisions in "Materials" of these special provisions.

10-3.14 PEDESTRIAN SIGNALS

Light emitting diode signal modules for Type A pedestrian signals will be State-furnished in conformance with the provisions in "Materials" of these special provisions.

10-3.15 DETECTORS

Loop wire shall be Type 2.

Loop detector lead-in cable shall be Type B.

Slots shall be filled with hot-melt rubberized asphalt sealant.

At the Contractor's option, where a Type A loop is designated on the plans, a Type E loop may be substituted.

For Type E detector loops, sides of the slot shall be vertical and the minimum radius of the slot entering and leaving the circular part of the loop shall be 40 mm. Slot width shall be a maximum of 20 mm.

10-3.16 LUMINAIRES

Ballasts shall be 120/240 V multi-tap and shall be the lag or lead regulator type.

10-3.17 PHOTOELECTRIC CONTROLS

Contactors shall be the mercury type.

10-3.18 REMOVING, REINSTALLING OR SALVAGING ELECTRICAL EQUIPMENT

Salvaged electrical materials shall be hauled to Caltrans Maintenance Yard, 1604 South B Street, Stockton, CA 95026 and stockpiled.

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.

10-3.19 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.

SECTION 11. MODIFIED STANDARD SPECIFICATION SECTIONS

Asphalt concrete shall conform to the provisions in this Section 11-1, "Quality Control / Quality Assurance," and the section entitled "Asphalt Concrete" in Section 10-1, "General," of these special provisions. Section 39, "Asphalt Concrete," of the Standard Specifications shall not apply to Type A and Type B asphalt concrete.

SECTION 39: ASPHALT CONCRETE

39-1 GENERAL

39-1.01 DESCRIPTION

This work shall consist of furnishing and mixing aggregate and asphalt binder at a central mixing plant, transporting, spreading and compacting the mixture, and furnishing and placing pavement reinforcing fabric, in conformance with this Section 11-1, "Quality Control / Quality Assurance," and with "Asphalt Concrete" in Section 10-1, "General," of these special provisions.

The Contractor shall be responsible for controlling the quality of the asphalt concrete product entering the work, including aggregate, asphalt binder, additives, and asphalt concrete mixture; for controlling the quality of the work performed, including mix design, and mixing, transporting, spreading, and compacting the asphalt concrete; for controlling the quality of the finished roadway surface; and for developing, implementing, and maintaining a quality control program. The Contractor shall be responsible for the inspection, sampling, and testing required to control the quality of the asphalt concrete and the work performed.

The inspection, sampling, and testing required to control the quality of the workmanship and the asphalt concrete shall conform to this Section 11-1. Sampling shall be in conformance with the requirements of this Section 11-1 and with California Test 125. Testing shall be performed using California Tests unless otherwise directed by the Engineer or this Section 11-1.

Asphalt concrete is designated as Type A or Type B. The type of asphalt concrete will be shown on the plans or specified in "Asphalt Concrete" in Section 10-1, "General," of these special provisions.

39-2 MATERIALS

39-2.01 ASPHALTS

Asphalt binder to be mixed with aggregate shall be steam-refined paving asphalt conforming to the provisions in Section 92, "Asphalts," of the Standard Specifications. Asphalt binder shall be Grade AR-4000 unless the grade is designated in "Asphalt Concrete" in Section 10-1, "General," of these special provisions.

Liquid asphalt for prime coat shall conform to the provisions in Section 93, "Liquid Asphalts," of the Standard Specifications and shall be the grade designated by the contract item or conform to the provisions in "Asphalt Concrete," in Section 10-1, "General," of these special provisions.

Asphalt emulsion for paint binder (tack coat) shall conform to the provisions in Section 94, "Asphaltic Emulsions," of the Standard Specifications for the rapid-setting or slow-setting type and grade approved by the Engineer.

Paving asphalt to be used as a binder for pavement reinforcing fabric shall be a steam-refined paving asphalt conforming to the provisions in Section 92, "Asphalts," of the Standard Specifications, and shall be Grade AR-4000, unless otherwise ordered by the Engineer or designated in "Asphalt Concrete" in Section 10-1, "General," of these special provisions.

39-2.02 AGGREGATE

Aggregate and combined aggregate shall conform to the quality and gradation provisions in this Section 11-1, "Quality Control / Quality Assurance," for the asphalt concrete types and sizes conforming to the provisions in "Asphalt Concrete" in Section 10-1, "General," of these special provisions.

Aggregates shall be clean and free from decomposed or organic materials and other deleterious substances. Coarse aggregate is material retained on the 4.75-mm sieve, fine aggregate is material passing the 4.75-mm sieve, and supplemental fine aggregate is added fine material passing the 600-µm sieve, including, but not limited to, cement and stored fines from dust collectors.

The target value for the percent passing each designated sieve size for the aggregate blend used in the proposed asphalt concrete mix design shall fall within the "Target Value Limits" of the following table:

Table 39-1 - AGGREGATE GRADATION
Type A and Type B Asphalt Concrete
Percentage Passing

19-mm Maximum, Coarse		19-mm Maximum, Medium	
Sieve Sizes	Target Value Limits	Sieve Sizes	Target Value Limits
25-mm	100	25-mm	100
19-mm	90-100	19-mm	90-100
9.5-mm	60-75	9.5-mm	65-80
4.75-mm	45-50	4.75-mm	49-54
2.36-mm	32-36	2.36-mm	36-40
600-µm	15-18	600-µm	18-21
75-µm	3-7	75-µm	3-8

12.5-mm Maximum, Coarse		12.5-mm Maximum, Medium	
Sieve Sizes	Target Value Limits	Sieve Sizes	Target Value Limits
19-mm	100	19-mm	100
12.5-mm	95-100	12.5-mm	95-100
9.5-mm	75-90	9.5-mm	80-95
4.75-mm	55-61	4.75-mm	59-66
2.36-mm	40-45	2.36-mm	43-49
600-µm	20-25	600-µm	22-27
75-µm	3-7	75-µm	3-8

During asphalt concrete production, aggregate gradation shall be within the limits specified in Table 39-9, "Minimum Quality Control Requirements," of this Section 11-1. Conformance with the grading requirements shall be determined by California Test 202, modified by California Test 105, when there is a difference in specific gravity of 0.2 or more between the coarse and fine portions of the aggregate or between the blends of the different aggregates. The percent passing the 75-µm sieve shall be reported to the first decimal place (tenths).

The combined aggregate shall conform to the following quality requirements prior to the addition of the asphalt binder:

Table 39-2 - AGGREGATE QUALITY REQUIREMENTS

Quality	California Test	Asphalt Concrete Type A	Asphalt Concrete Type B
Percent of Crushed Particles	205		
Coarse Aggregate (Min.)		90%	25%
Fine Aggregate (Passing 4.75-mm, Retained on 2.36-mm) (Min.)		70%	20%
Los Angeles Rattler	211		
Loss at 100 Rev. (Max.)		12%	
Loss at 500 Rev. (Max.)		45%	50%
Sand Equivalent (Min.)[1]	217	47	42
Kc Factor (Max.)	303	1.7	1.7
Kf Factor (Max.)	303	1.7	1.7

Note:
1. Reported value shall be the average of 3 tests split from a single sample.

39-2.03 ASPHALT CONCRETE MIXTURE

The asphalt concrete mixture, composed of the proposed aggregate blend and the proposed asphalt binder content as determined by California Test 367, shall conform to the following requirements:

Table 39-3 - ASPHALT CONCRETE MIXTURE REQUIREMENTS

Design Parameters	California Test	Asphalt Concrete Type and Location: Coast and Valley Type A	Coast and Valley Type B	Desert (per Engineer) Type A	Desert (per Engineer) Type B
Hveem Stabilometer Value (Min.)	367[1, 2]	37	35	37	35
Percent air voids (Mix Design)	367[1]	3-5[3]	3-5[3]	4-6[4]	4-6[4]
(Start-Up Production Evaluation)		Design Value ±1.0			
Swell [5] (mm) (Max)	305	0.76	0.76	0.76	0.76

Notes:
1. Reported value shall be the average of 3 tests from a single split sample.
2. If the range of stability for the 3 briquettes is more than 12 points, the briquettes shall be discarded and new samples shall be fabricated.
3. Modify California Test 367, paragraph C5, to "most nearly 4%."
4. Modify California Test 367, paragraph C5, to "most nearly 5%."
5. Measured at Mix Design only.

During production and placement, the asphalt concrete mixture shall conform to the requirements of Table 39-4, "Minimum Process Control Requirements," and Table 39-9, "Minimum Quality Control Requirements," of this Section 11-1. Changes in cold feed or hot bin proportions to conform to the aggregate grading requirements shall not be considered changes in the mix design.

Whenever asphalt concrete production has been suspended for longer than 30 days, the Contractor, on the first day of resumption of production, shall sample and test the asphalt concrete to demonstrate conformance with the requirements of Table 39-3, "Asphalt Concrete Mixture Requirements," Table 39-4, "Minimum Process Control Requirements," and Table 39-9, "Minimum Quality Control Requirements," of this Section 11-1.

The target value for asphalt content may be changed by as much as ± 0.2 percent during the production start-up evaluation specified in Section 39-10.02A, "Production Start-Up Evaluation," of this Section 11-1 or after production start-up evaluation and before the first day of regular production with the Engineer's approval. The Contractor shall demonstrate that asphalt concrete that has been produced through the plant using the modified target value for asphalt content is in conformance with this Section 11-1 by submitting test results for samples obtained from the first 500 tonnes of production. Stability and percent air voids shall be determined using 3 briquettes constructed from a single sample taken from 4 locations across the mat in conformance with the requirements of California Test 125.

Changes from one mix design to another shall not be made during the progress of the work, unless approved by the Engineer. Changes in asphalt content, other than those allowed during the start-up evaluation process, or in aggregate grading target values shall be considered to be a change in the asphalt concrete mixture and shall require a new mix design proposal. Changes in the asphalt content or aggregate grading target values approved by the Engineer will not be applied retroactively for acceptance or payment.

39-2.04 PAVEMENT REINFORCING FABRIC

Pavement reinforcing fabric shall conform to the provisions in Section 88, "Engineering Fabrics," of the Standard Specifications and these special provisions.

39-3 ASPHALT CONCRETE MIX DESIGN PROPOSAL AND REVIEW

39-3.01 CONTRACTOR MIX DESIGN PROPOSAL

The Contractor shall submit for the Engineer's review a proposed asphalt concrete mix design for each asphalt concrete mixture to be used at least 14 days prior to production of that asphalt concrete mixture. The asphalt concrete mix design shall be prepared by a laboratory (or laboratories) whose proficiency has been reviewed and qualified in conformance with the Department's Quality Assurance Program. Aggregate quality and asphalt concrete mix design test results shall be no more than one year old when production of the asphalt concrete mixture starts. For projects of more than one year's duration, asphalt concrete may be produced using the asphalt concrete mix design that was reviewed and accepted at the start of the project provided the asphalt concrete mixture continues to conform to the provisions of this Section 11-1, "Quality Control / Quality Assurance."

The Contractor shall submit a mix design letter that indicates the target values proposed for gradation, asphalt content, and percent air voids. This submittal shall include test results for aggregate and asphalt mixture quality; plots of the combined gradings showing the production tolerances; plots of unit weight, stability, and percent air voids versus asphalt content for the asphalt contents considered in the design process. In addition, this submittal shall include test results for stability, percent air voids, and swell for 3 briquettes constructed using the submitted aggregate and asphalt blended at the proposed target values for each asphalt concrete mixture to be used.

The Contractor shall submit the following for each asphalt concrete mixture proposed:

A. Aggregate and mineral filler:

1. Target values for percent passing each sieve size for the aggregate blend;
2. Results of tests for aggregate quality requirements;
3. Source of each aggregateto be used including producer, location, and California Mine Identification number;
4. Percentage of each aggregate stockpile, cold feed or hot bin to be used;
5. Gradation of each aggregate stockpile, cold feed or hot bin to be used; and
6. Samples that are representative of the aggregate to be used. Minimum sample sizes shall be as follows:

60 kg of each coarse aggregate;
40 kg of each fine aggregate; and
5 kg of each supplemental fine aggregate.

B. Asphalt binder:

1. Asphalt binder source and target value;
2. Four one-liter samples of the asphalt binder;
3. Results of the asphalt binder quality tests conforming to the provisions in Section 92, "Asphalts," of the Standard Specifications; and
4. Material Safety Data Sheets.

C. Antistrip additives**,** when applicable:

1. A 5-kg sample of the dry additive or a one-liter sample of the liquid antistrip additive, including name of product, manufacturer, manufacturer's designation and proposed rate, location, and method of addition; and
2. Material Safety Data Sheets.

The proposed asphalt concrete mix design submittal will be considered complete only when the mix design letter, test results, plots, and samples have been received by the Engineer.

39-3.02 ENGINEER REVIEW OF ASPHALT CONCRETE MIX DESIGN

The Engineer will review the proposed aggregate and asphalt concrete mixture for conformance with this Section 11-1, "Quality Control / Quality Assurance." The proposed asphalt concrete mixture will be reviewed at the proposed target values for aggregate grading and asphalt content. The Engineer will have 14 days to review each submittal of a proposed mix design. Production of asphalt concrete shall not begin until written notification has been received from the Engineer that the aggregates and proposed mix design meet the quality requirements of this Section 11-1.

The Engineer will reject a proposed asphalt concrete mixture that, during review, fails to meet the quality requirements of Table 39-2, "Aggregate Quality Requirements," and Table 39-3, "Asphalt Concrete Mixture Requirements," of this Section 11-1. The Contractor shall resubmit a mix design letter providing new test results, plots, and material samples.

Disagreements in mix design review shall be resolved in conformance with Section 39-6, "Dispute Resolution," of this Section 11-1. The Contractor shall use a mix design on the project only after the Engineer concurs that the aggregate and asphalt concrete represented by the proposed mix design conforms to the provisions ofthis Section 11-1.

The Engineer will review one proposed asphalt concrete mix design for each asphalt concrete type and aggregate size from each plant proposed for use on this project at the State's expense. Costs for additional reviews due to failure to conform to the quality requirements of this Section 11-1 and for reviewing other proposed asphalt concrete mix designs will be deducted from moneys due or to become due the Contractor. The cost for each review will be $1,500. Costs for reviewing changes in a mix design that are initiated by the Engineer will be waived. Contractor's retesting due to errors in the Engineer's testing will be paid for as extra work as provided in Section 4-1.03D of the Standard Specifications. Costs for reviewing mix designs not used in this project will be deducted from moneys due or to become due the Contractor.

39-4 CONTRACTOR QUALITY CONTROL

39-4.01 GENERAL

The Contractor shall be responsible for the quality of the asphalt concrete entering into the work and of the work performed. In addition, the Contractor shall be responsible for the quality of asphalt concrete or ingredients procured from subcontractors or vendors. A quality control system shall be established, maintained, and modified, if needed, that will provide assurance that materials and completed work conform to contract requirements.

At least 14 days prior to the start of production of asphalt concrete, the Contractor shall submit a written Quality Control Plan. At the request of the Engineer or the Contractor, the Contractor shall discuss the Quality Control Plan with the Engineer.

39-4.02 QUALITY CONTROL PLAN

The Quality Control Plan shall describe the organization and procedures that will be used to administer the quality control system including the procedures used to control the production process, the procedures used to determine when changes to the production process are needed, and the procedures proposed to be used to implement the required changes. The Quality Control Plan shall meet the minimum standards set forth in the Department's "Manual for Quality Control and Quality Assurance for Asphalt Concrete," available as specified in "Asphalt Concrete" in Section 10-1, "General," of these special provisions.

Asphalt concrete production and placement shall not begin until the Quality Control Plan has been approved by the Engineer. Approval of the Quality Control Plan does not imply a warranty by the Engineer that adherence to the plan will result in production of asphalt concrete that complies with this Section 11-1. It shall remain the responsibility of the Contractor to demonstrate such compliance.

The Quality Control Plan shall include the name and qualifications of a Quality Control Manager. The Quality Control Manager shall be responsible for the administration of the Quality Control Plan, including compliance with the plan and plan modifications. The Quality Control Manager shall be responsible to the Contractor, shall have the authority to make decisions concerning quality of the work or product, and shall be available to the project within less than 3 hours during paving. Except in cases of emergency and with the approval of the Engineer, the Quality Control Manager cannot be a foreman, member of the production or paving crew, an inspector or tester on this project during pavement production and placement.

The Quality Control Plan shall identify personnel, equipment and documentation required for a complete inspection, sampling and testing program. The Quality Control Plan shall include, but not be limited to, a list of inspectors, samplers and testers, their duties, their certifications if required, and their experience if no certification is required. It shall also list the name and location of laboratories that shall be providing information to the Engineer, the testers who conducted the tests and their certifications and the name of the Laboratory Quality Control Manager responsible for oversight of the testing program. It shall also show examples of the test result forms (if different from those in the Department's "Manual for Quality Control and Quality Assurance for Asphalt Concrete"), the roadway and plant inspection forms, the Quality Control Manager's daily

summary form, and the compliance charts. It shall include the method by which random sampling shall be determined, a list of the testing and sampling equipment to be used and the current calibration dates and calibration charts, and copies of nuclear gauge licenses.

The Quality Control Plan shall include the name and certification of a testing consultant to be an Independent Third Party in dispute resolution. By mutual agreement during dispute resolution, the Independent Third Party may be a District Independent Assurance Sampler and Tester, the testing consultant or both. The proficiency of the testing consultant shall be reviewed and certified in conformance with the requirements of the Department's Quality Assurance Program before the test consultant participates in dispute resolution. Attention is directed to Section 39-6, "Dispute Resolution," of this Section 11-1.

The Quality Control Plan may be modified as work progresses. A supplement shall be submitted whenever there are changes to quality control procedures or personnel. Asphalt concrete production and placement shall not resume or continue until revisions to the Quality Control Plan or quality control personnel have been approved by the Engineer.

39-4.03 CONTRACTOR QUALITY CONTROL INSPECTION, SAMPLING, AND TESTING

The Contractor shall perform process and quality control sampling and testing, provide inspection, and exercise management control to ensure that asphalt concrete production and placement conforms to the provisions of this Section 11-1. Staffing for process and quality control shall meet the minimum requirements outlined in the Department's "Manual for Quality Control and Quality Assurance for Asphalt Concrete."

Process and quality control, sampling, testing, and inspection shall be provided during the asphalt concrete work. Sampling, testing, and inspection shall be performed at a rate sufficient to ensure that asphalt concrete conforms to the provisions of this Section 11-1.

A roadway inspector shall be provided while asphalt concrete paving operations are in progress. The roadway inspector shall ensure that asphalt concrete placement conforms to industry standards and to the spreading, compacting, and finishing requirements of this Section 11-1, "Quality Control / Quality Assurance." Plant inspection shall be performed as necessary to maintain control of the asphalt concrete production.

Minimum sampling and testing requirements for process and quality control are specified in Table 39-4, "Minimum Process Control Requirements," and Table 39-9, "Minimum Quality Control Requirements," of this Section 11-1. Sampling shall be statistically based and random.

During production start-up evaluation, the Contractor shall sample and test in conformance with the provisions in Section 39-10.02A, "Production Start-Up Evaluation," of this Section 11-1.

A testing laboratory and personnel shall be provided for the performance of process and quality control testing. The Engineer shall have unrestricted access to mix design, sampling, and testing.

The proficiency of testing laboratories and sampling and testing personnel shall be reviewed, qualified, and certified by the Department's Independent Assurance Sampler and Tester before providing services to the project. Inspectors shall meet the standards set forth in the Department's "Manual for Quality Control and Quality Assurance for Asphalt Concrete."

39-4.04 CONTRACTOR PROCESS CONTROL

Process control sampling and testing shall be performed and control shall be exercised to ensure that asphalt concrete production conforms with this Section 11-1.

Minimum process control sampling and testing shall be performed in compliance with the following:

Table 39-4 - MINIMUM PROCESS CONTROL REQUIREMENTS

Quality Characteristic	Action Limit	California Test	Minimum Sampling and Testing Frequency	Point of Sampling ‡	Reporting Time Allowance
Sand Equivalent (Min)	47 (Type A) 42 (Type B)	217	One sample per 2500 tonnes	Batch plant - from hot bins. Drum plant - from cold feed.	24 hours
		(Reported value shall be the average of 3)[1]	Not less than one sample per 2 days		
Stability	37 (Type A) 35 (Type B)	366[2]	See Note 4	Mat behind paver	48 hours
		(Reported value shall be the average of 3)[1,3,5]	Not less than one sample per 5 days		

Notes:

‡ In conformance with the requirements of California Test 125.

1. Samples used for the 3 tests to be averaged shall be from a single split sample.
2. Reheat for sample preparation shall be 2 hours maximum.
   Do not place sample or briquette in oven for 15-hour cure.
3. Briquettes shall be fabricated from a single, combined sample obtained from at least 4 locations across the mat behind the paver in conformance with the requirements of California Test 125.
   If the range of stability for the three briquettes is more than 12 points, the samples shall be discarded and new samples shall be obtained before the end of the following shift of paving and tested in conformance with the requirements of Table 39-3, "Asphalt Concrete Mixture Requirements."
4. Asphalt concrete will be sampled and tested each of the first 5 days of production and may be decreased to one for each 5 days thereafter unless stability falls below the action limit.
   When stability falls below the action limit, sampling will be increased to one sample for each of the first 5 days of production and may be decreased to one for each 5 days thereafter.
   The sequence of the first 5 test results shall not be broken by more than 7 days of suspended operations.
5. During production start-up evaluation, a correlation factor for cured vs. uncured specimens shall be established in conformance with the requirements of Section 39-10.02A, "Production Start-Up Evaluation."

The process control test results shall be plotted on specification compliance charts indicating the action limits for the quality characteristic. When one test result falls below the action limit for an individual measurement, the Contractor shall notify the Engineer, take corrective action, and sample and test within the next 500 tonnes of production. When 2 consecutive test results for an individual characteristic fall below the action limit, the asphalt concrete represented by the 2 tests shall be considered not in compliance. When 2 consecutive test results for an individual characteristic fall below the action limit, the Contractor shall suspend production, notify the Engineer, and take corrective action. With the approval of the Engineer, up to 1000 tonnes of asphalt concrete may be placed to demonstrate that the asphalt concrete is once again in compliance with the provisions of this Section 11-1. Production shall begin only after the Engineer has received test results confirming compliance.

Asphalt concrete that has 2 consecutive stability test results less than or equal to 26 for Type A asphalt concrete or less than or equal to 24 for Type B asphalt concrete shall be removed at the Contractor's expense. Asphalt concrete placed to demonstrate compliance that does not meet the provisions of this Section 11-1 shall be removed at the Contractor's expense.

39-4.05 CONTRACTOR QUALITY CONTROL

Quality control, sampling, testing, and inspection shall be provided during asphalt concrete work. Sampling, testing, and inspection shall be performed at a rate sufficient to ensure that the asphalt concrete product conforms to the requirements in this Section 11-1. Sampling for testing to be reported to the Engineer shall be performed at the minimum frequency specified in Table 39-9, "Minimum Quality Control Requirements," of this Section 11-1, "Quality Control / Quality Assurance."

Quality control samples of aggregates and asphalt concrete mixture shall be obtained and split. One split portion of each sample shall be used for quality control testing and the other portion shall be reserved for possible retest during dispute

resolution, in conformance with Section 39-6, "Dispute Resolution," of this Section 11-1. Quality control samples shall be stored in a location listed in the Quality Control Plan until disposal has been approved by the Engineer.

The Contractor shall obtain a one-liter sample of the asphalt binder in conformance with Section 39-7.01C, "Asphalt Binder Storage," of this Section 11-1 for each day of asphalt concrete production. The sample containers shall be labeled as shown in the "Manual for Quality Control and Quality Assurance for Asphalt Concrete" and shall be sent by the Contractor to the Transportation Laboratory on a weekly basis, except for modified asphalts that shall be shipped daily. A copy of the transmittal form shall be attached to the daily report of inspection.

When test results for a single quality characteristic deviate beyond the limits specified in Table 39-9, "Minimum Quality Control Requirements," of this Section 11-1 the Contractor shall take corrective action and shall bring the asphalt concrete within the specification limits. The corrective action taken shall be documented in the records of inspection in conformance with Section 39-4.06B, "Records of Inspection and Testing," of this Section 11-1. When a single quality characteristic deviates 3 consecutive times beyond the limits specified in Table 39-9, "Minimum Quality Control Test Requirements," of this Section 11-1, the Contractor shall suspend production, shall notify the Engineer, and shall take corrective action. With the approval of the Engineer, up to 1000 tonnes of asphalt concrete may be placed and the requirements of Section 39-10.02A, "Production Start-Up Evaluation," of this Section 11-1 shall be used to demonstrate that the asphalt concrete is once again in compliance with this Section 11-1. Production of asphalt concrete shall start only after the Engineer has received test results confirming compliance. When an individual quality characteristic deviates 3 consecutive times beyond the specification limits and production of asphalt concrete has been suspended, the lot shall be terminated.

If an ignition oven is used for asphalt content in conformance with the requirements of California Test 382, gradations of the remaining aggregates shall be provided for each 5000 tonnes of production. Testing of the aggregates shall be in conformance with the requirements of California Test 202, Sections F and G, "Sieve Analysis of Fine and Coarse Aggregates." Test results from these gradings shall be provided prior to completion of the project. Gradings from the aggregates recovered from the ignition oven will not be used in the statistical analysis for quality or for pay. Payment for these gradings will be made as extra work as provided in Section 4-1.03D of the Standard Specifications at the rate of $150 per test result for the cost of the additional testing.

39-4.06 CHARTS AND RECORDS

The Contractor shall record sampling and testing results for both process control and for quality control on forms as provided in the Department's "Manual for Quality Control and Quality Assurance for Asphalt Concrete" or on forms approved by the Engineer. Complete testing records shall be maintained and posted in the Contractor's laboratory. Models of forms that are different from those in the Department's "Manual for Quality Control and Quality Assurance for Asphalt Concrete," locations of postings, and times and means of submissions shall be provided in the Quality Control Plan.

For every 5000 tonnes of asphalt concrete produced, the Contractor shall provide an electronic copy of the process and quality control test results using the Department's statistical evaluation program "ACPay" available as specified in "Asphalt Concrete" in Section 10-1, "General," of these special provisions.

Compliance charts and inspection and testing records, except stability test results used for process control, shall be submitted within 24 hours after completion of that shift of asphalt concrete production. If the record is incomplete or in error, a copy of the record will be returned with the deficiencies noted by the Engineer. The Contractor shall correct deficiencies and return the updated record by the start of the following working day. When errors or omissions in the inspection or testing records repeatedly occur, asphalt concrete production and placement shall be suspended and the procedures by which the records are produced shall be corrected before production and placement will be restarted.

39-4.06A Compliance Charts

The Contractor shall develop and maintain time linear specification compliance charts. The compliance charts shall identify the project, test number, test parameter, applicable upper and lower specification limits, and test results.

Compliance charts shall be kept current and shall be posted at a location designated in the Quality Control Plan. Compliance charts shall be updated each day of asphalt concrete production, and up-to-date copies shall be included in the submittals to the Engineer of each day's test results.

39-4.06B Records of Inspection and Testing

For each day of asphalt concrete production, the Contractor shall prepare an "Asphalt Concrete Construction Daily Record of Inspection," on forms provided in the Department's "Manual for Quality Control and Quality Assurance for Asphalt Concrete." A form shall be submitted for inspection at the plant and at the roadway.

For each day of asphalt concrete production, the Contractor shall prepare an "Asphalt Concrete Inspection and Testing Summary" on a form provided in the Department's "Manual for Quality Control and Quality Assurance for Asphalt Concrete." Plant and roadway inspection forms documenting the day's plant production and roadway placement shall be completed. Deviations from the specifications or the Contractor's regular practice shall be listed and explained. Individual

inspection forms shall be signed by the inspector and initialed by the Quality Control Manager and attached to the summary at submittal. Test forms documenting test results shall be complete, signed by the tester, checked and initialed by the Quality Control Manager, and attached to the summary at submittal. Sampling and testing data and calculations that support a test result shall be made available to the Engineer within 48 hours when requested.

The "Asphalt Concrete Inspection and Testing Summary" shall include the following certification signed by the Quality Control Manager:

> It is hereby certified that the information contained in this record is accurate, and that information, tests or calculations documented herein comply with the requirements of the contract and the standards set forth in the testing procedures. Exceptions to this certification are documented as a part of this record.

39-5 ENGINEER QUALITY ASSURANCE

39-5.01 GENERAL

The Engineer will assure conformance to contract specifications by review of the Contractor's mix design proposal, by inspection of the Contractor's procedures, by oversight of the Contractor's quality control inspection and records, by splitting and testing samples with the Contractor during evaluation of the plant production start-up and the nuclear density test strip, and by independent verification sampling and testing of the asphalt concrete and aggregates during asphalt concrete production.

The Contractor may witness assurance sampling and testing. However, the Engineer will not be required to notify the Contractor of anticipated sampling schedules or locations and will not delay sampling or testing if the Contractor is unable to attend. The Contractor shall not use samples taken for assurance testing for testing and submittal as a quality control test result.

The Engineer will provide the Contractor with copies of the assurance test results not more than 2 working days after receipt of the results. Sampling and testing data and calculations that support a test result shall be made available to the Contractor within 48 hours when requested.

The Engineer may test the asphalt, aggregates or asphalt concrete mixture to determine conformance with this Section 11-1, "Quality Control / Quality Assurance," whenever an asphalt concrete mixture or ingredient appears defective or inconsistent or whenever a test result indicates a change in the characteristics of the asphalt concrete mixture or an ingredient. Asphalt, aggregates or asphalt concrete that does not conform with this Section 11-1 will be rejected in conformance with Section 39-11, "Acceptance of Work," of this Section 11-1.

The Contractor, when directed by the Engineer, shall obtain representative samples of the asphalt concrete mixture or ingredients that appear defective or inconsistent. The samples shall be split into 4 portions. The Contractor shall retain 1 portion for testing if the Contractor chooses and 3 portions shall be delivered to the Engineer. The asphalt concrete or ingredient need not be sampled if the Contractor elects to remove and replace the asphalt concrete, at the Contractor's expense, or if the Contractor uses a method of correcting the situation that has been approved by the Engineer. Test results from these additional samples shall not be used as a basis for a calculated pay factor.

39-5.02 SAMPLING AND TESTING FOR VERIFICATION

Independent of the Contractor's quality control testing, the Engineer will obtain random samples of the aggregate and asphalt concrete mixture and test for in-place density.

Samples of aggregates and asphalt concrete will be obtained during asphalt concrete production and placement, and will be split into at least 4 portions. One of the split portions will be tested by the Engineer and used to verify quality control test results, one portion will be provided to the Contractor, and 2 portions will be reserved and stored for testing in conformance with the provisions in Section 39-6, "Dispute Resolution," of this Section 11-1. When verifying the relative compaction, the Engineer will obtain a sample of a sample of asphalt concrete from the mat behind the paver, will split the sample and apportion the sample as described above, and will test the sample for test maximum density.

The Engineer will test for material quality characteristics specified in Table 39-9, "Minimum Quality Control Requirements," of this Section 11-1. Verification tests will be at a frequency of not less than 10 percent of the minimum quality control sampling and testing frequency and will be performed in conformance with the test methods specified in Table 39-9, "Minimum Quality Control Requirements," of this Section 11-1. Verification tests will be performed using the same test methods used for quality control testing.

During the Engineer's verification of the relative compaction, the Engineer will determine the location of 500 tonnes of asphalt concrete to be tested using a random number, will obtain an asphalt concrete sample from within this location for determination of the test maximum density, and will determine the relative compaction of the in-place asphalt concrete as specified in California Test 375. The Contractor shall obtain one of the split samples of asphalt concrete for determination of test maximum density and shall determine the relative compaction of the 500 tonnes of asphalt tested by the Engineer using the same testing sites determined by the Engineer. The results of this common testing will be compared to the allowable testing difference defined in Table 39-6, "Allowable Testing Differences," of this Section 11-1. If the test maximum density or the relative compaction does not comply with the allowable testing difference, then the Engineer and Contractor will use the first 500 tonnes of the next day's production to re-correlate the nuclear gauges used in testing as defined by California Test 375.

During production start-up evaluation, the Engineer will witness the sampling of asphalt concrete and aggregates and will perform tests on the materials in conformance with Section 39-10.02A, "Production Start-Up Evaluation," of this Section 11-1.

39-5.03 VERIFICATION

The Engineer will determine the acceptability of the quality control test results by using the *t*-test for sample means to test whether or not the means of the quality control test results and verification test results are within an allowable testing difference. Quality control test results and verification test results for each indexed quality characteristic will be used in the verification process.

The *t*-value of the group of test data to be verified is computed as follows:

$$t = \frac{\left|\overline{X}_c - \overline{X}_v\right|}{S_p\sqrt{\frac{1}{n_c} + \frac{1}{n_v}}} \qquad \text{and} \qquad S_p^2 = \frac{S_c^2(n_c - 1) + S_v^2(n_v - 1)}{n_c + n_v - 2}$$

where:

n_c	=	Number of Contractor's quality control tests (minimum of 2 required)
n_v	=	Number of Verification tests (minimum of 1 required)
$\overline{X}_c$	=	Mean of the Contractor's quality control tests
$\overline{X}_v$	=	Mean of the Verification tests
S_p	=	Pooled standard deviation (When $n_v = 1$, $S_p = S_c$)
S_c	=	Standard deviation of the Contractor's quality control tests
S_v	=	Standard deviation of the Verification tests (when $n_v > 1$)

The comparison of quality control test results and verification test results will be considered at a level of significance, $\alpha = 0.01$. Compute *t* using the equation above and compare to the critical *t*-value, t_{crit} , from the following table:

Table 39-5 - CRITICAL t-VALUE FOR VERIFICATION OF QUALITY CONTROL TESTING

degrees of freedom (nc+nv-2)	t_{crit} (for $\alpha = 0.01$)	degrees of freedom (nc+nv-2)	t_{crit} (for $\alpha = 0.01$)
1	63.657	18	2.878
2	9.925	19	2.861
3	5.841	20	2.845
4	4.604	21	2.831
5	4.032	22	2.819
6	3.707	23	2.807
7	3.499	24	2.797
8	3.355	25	2.787
9	3.250	26	2.779
10	3.169	27	2.771
11	3.106	28	2.763
12	3.055	29	2.756
13	3.012	30	2.750
14	2.977	40	2.704
15	2.947	60	2.660
16	2.921	120	2.617
17	2.898	∞	2.576

Quality control test results are verified if the *t*-value computed is less than or equal to t_{crit} ($t \leq t_{crit}$), and the difference between the means of the quality control test results and verification test results are within an allowable testing difference. Quality control test results are not verified if the *t*-value computed is greater than t_{crit} ($t > t_{crit}$), and the difference between the means exceeds the allowable testing difference. The allowable testing difference shall be as follows:

Table 39-6 - ALLOWABLE TESTING DIFFERENCE

Quality	California Test	Allowable Testing Difference
Sand Equivalent (min.)	217	8
Hveem Stabilometer Value (min.)	366	10
Percent Air Voids	367	1.5
Asphalt Content	379 or 382	0.3%
Gradation	202	
19 or 12.5 mm		2
9.5 mm		4
4.75 mm		3
2.36 mm		2
600 µm		2
75 µm		1.0
Relative Compaction	375	0.8%
Test Maximum Density		0.03 g/cc

If quality control test results are not verified, the Contractor will be notified of the difference. The Engineer will sample asphalt concrete production at a more frequent interval. Resolution of the problem shall be in conformance with the provisions in Section 39-6, "Dispute Resolution," of this Section 11-1.

39-6 DISPUTE RESOLUTION

39-6.01 GENERAL

The Contractor and the Engineer shall work together to avoid potential conflicts and to resolve differences that may arise from a disagreement regarding test result comparisons.

Should the results of the testing fail to meet the criteria of the stage at which the disagreement arose, production shall be suspended. Production shall not start or resume nor shall asphalt concrete be accepted until the differences have been

resolved and the Engineer is assured that the asphalt concrete conforms to this Section 11-1, "Quality Control / Quality Assurance."

When the Engineer and the Contractor, together or separately, are unable to determine the source of error, an Independent Third Party shall act as witness and referee.

In disagreements, if the Engineer's testing process meets the requirements of this Section 11-1, costs related to the review shall be borne by the Contractor. The Contractor's sampling and testing program shall be modified as necessary. New test results shall be submitted to the Engineer. Test results judged to be in error shall be removed from consideration and the new test results shall be substituted. If split samples are not available and retesting is not possible, that portion of the asphalt concrete produced or placed prior to and during the disagreement will be evaluated based on the results of the Engineer's verification test results.

In disagreements, if the Engineer's testing process fails to meet the requirements of this Section 11-1, costs related to the review shall be borne by the State. The Engineer's sampling and testing program will be modified as necessary. Test results judged to be in error shall be removed from consideration and the new test results shall be substituted. Contractor's retesting due to errors in the Engineer's testing will be paid for as extra work as provided in Section 4-1.03D of the Standard Specifications. If, in the opinion of the Engineer, the Contractor's controlling operation is delayed or interfered with by reason of delays or errors in the Engineer's testing, the delay will be considered a right of way delay as provided in Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

In disagreements, if both the Contractor's and the Engineer's testing processes have failed to meet the requirements of this Section 11-1 or if the cause cannot be determined, each party will bear the costs related to their own review. When appropriate, the Contractor's and the Engineer's sampling and testing programs shall be modified as necessary, split samples of the Contractor's quality control samples or the Engineer's verification samples shall be retested, and the new quality control test results shall be submitted to the Engineer. Test results judged to be in error shall be removed from consideration and the new test results shall be substituted. If split samples of aggregates or asphalt concrete mixture from the Contractor's testing are not available where retesting is required, that portion of the asphalt concrete produced prior to and during the disagreement will be evaluated based on the results of the Engineer's verification test results.

39-6.02 DURING THE ASPHALT CONCRETE MIX DESIGN REVIEW

During the asphalt concrete mix design review, if the Engineer's review does not confirm that one or more of the aggregate or the asphalt concrete mixture qualities comply with this Section 11-1, "Quality Control / Quality Assurance," both parties will review their sampling, testing, and test results and shall share their findings. Testers and laboratories shall be made available for witnessing. Calculations and test results shall be made available for review. If an error in the Contractor's testing is detected during this review, the Contractor shall, as is appropriate, recalculate or retest. The new test results shall be submitted to the Engineer. If an error in the Engineer's testing is detected, the Engineer will, as is appropriate, recalculate or retest.

If the Contractor's and Engineer's review does not reveal the source of conflict, the Contractor's and the Engineer's sampling and testing processes shall be witnessed by the Independent Third Party. Testing to resolve the dispute in results for the mix design shall be performed using samples that were obtained and split while being witnessed by the Independent Third Party. Review of sample preparation and testing will be performed at both the Contractor's and the Engineer's laboratory on a portion of the split material while being witnessed by the Independent Third Party. The resulting mix design shall be used for production.

39-6.03 DURING THE PRODUCTION START-UP EVALUATION

When the Contractor's and Engineer's test results during production start-up fail to meet the provisions in Section 39-10.02, "Production Start-Up Evaluation and Nuclear Density Test Strips," both parties will review their sampling, testing, and test results, and shall share their findings. Testers and laboratories shall be made available for witnessing. Calculations and test results shall be made available for review. If an error in the Contractor's testing is detected during this review, the Contractor shall, as is appropriate, recalculate or retest. The new test results shall be submitted to the Engineer. If an error in the Engineer's testing is detected, the Engineer will, as is appropriate, recalculate or retest.

If the Contractor's and the Engineer's review does not resolve the differences, the Contractor's and the Engineer's testing processes shall be witnessed by the Independent Third Party using the 2 remaining portions of the split samples. If necessary, a 250-tonne to 500-tonne quantity of asphalt concrete shall be placed at a location agreed to by the Engineer to provide asphalt concrete and ingredients for sampling and testing for the Independent Third Party review.

If an error in the Contractor's testing is detected by the Independent Third Party, the Contractor shall take corrective action and, as appropriate, recalculate or retest the split portion of the trial quantity of asphalt concrete in question. The new test results shall be submitted to the Engineer. If an error in the Engineer's testing is detected by the Independent Third Party, the Engineer will take corrective action and, as appropriate, recalculate or retest the split portion of the first trial quantity.

Production shall not start nor shall asphalt concrete be accepted until the differences have been resolved and the test results meet the provisions in Section 39-10.02, "Production Start-Up Evaluation and Nuclear Density Test Strips," of this Section 11-1.

39-6.04 DURING PRODUCTION

When it is determined that the quality control test results could not be verified, both parties will review their sampling, testing, and test results, and shall share their findings. Testers and laboratories will be made available for witnessing. Calculations and results will be made available for review.

If an error in the quality control sampling or testing is detected during the Contractor's or the Engineer's review, the Contractor shall either recalculate or, if appropriate, retest using the reserved split portions of the quality control samples. These new test results shall be submitted to the Engineer. If an error in the verification sampling or testing is detected, the Engineer will recalculate or, if appropriate, retest using a reserved split portion of the verification samples. Using the new test results, the Engineer will repeat the calculation of the *t*-test and will determine if the means of the quality control tests and the verification test results are within the allowable testing difference as specified in Section 39-5.03, "Verification," of this Section 11-1.

When the verification test results do not verify the quality control test results 3 consecutive times, both the Contractor's and the Engineer's testers shall be witnessed by the Independent Third Party while sampling, splitting, and testing samples from the production unit or from the mat . The Contractor may produce and place up to 1000 tonnes of asphalt concrete to provide materials and sampling opportunities. Production and placement of asphalt concrete will be suspended until the Independent Third Party has completed the review of the Contractor's and the Engineer's sampling and testing and resolved the differences.

If an error in the Contractor's testing is detected by the Independent Third Party, the Contractor shall take corrective action and, as appropriate, recalculate or retest the split portion of the quality control samples. The new test results shall be submitted to the Engineer. If an error in the Engineer's testing is detected by the Independent Third Party, the Engineer will take corrective action and, as appropriate, recalculate or retest a split portion of the verification samples. When the error has been detected and corrected, production shall resume and the services of the Independent Third Party will be discontinued.

If a problem is not identified during the Independent Third Party review, the Independent Third Party shall be retained for the duration of the project or until a problem has been identified. Until all asphalt concrete has been produced and placed, the Contractor shall sample and split quality control samples in the presence of the Independent Third Party. One portion of each sample shall be tested by the Contractor in conformance with the intervals specified in Table 39-9, "Minimum Quality Control Requirements," of this Section 11-1, and the other portion shall be delivered to the Engineer by the Independent Third Party. The Engineer will test at least one of every 5 of the split samples for verification purposes. A new lot will be designated for asphalt concrete produced since the Independent Third Party was consulted. The pay factor for this lot will be determined in conformance with Section 39-11.02, "Statistical Evaluation and Determination of Pay Factor," of this Section 11-1 with the exception that both the Contractor's quality control test results and the Engineer's verification test results will be combined and will be the basis for acceptance of that portion of the work. The pay factor for the lot of asphalt concrete which brought about the dispute resolution shall be determined in conformance with Section 39-11.02, "Statistical Evaluation and Determination of Pay Factor," of this Section 11-1 with the exception that both the Contractor's quality control test results and the Engineer's verification test results will be combined and will be the basis for acceptance of that portion of the work.

39-7 STORING, PROPORTIONING AND MIXING MATERIALS

39-7.01 STORAGE

The Contractor shall store the aggregate for asphalt concrete so that separately sized aggregates will not be intermingled and shall store asphalt binder so that different grades of asphalt will not be intermingled. Aggregate that has been intermingled with aggregate of another size shall be removed by the Contractor and replaced with aggregate of specified grading.

When the Contractor adds supplemental fine aggregate, each supplemental fine aggregate used shall be stored separately and kept thoroughly dry.

The measurement and storage provisions of this Section shall not apply to the dust collected in skimmers and expansion chambers (knock-out boxes) or to the dust collected in centrifugal (cyclone) collectors. Dust from these collectors may be returned to the aggregate without being measured or stored separately, provided the dust is returned uniformly at a point in advance of the sampling device in batch-mixing plants or is returned at or before mixing in continuous mixing plants.

Aggregate and asphalt binder shall be stored in conformance with the following requirements.

39-7.01A Aggregate Cold Storage

Material shall be fed from storage with a mechanical feeder. Before being fed to the drier, aggregate shall be separated into 3 or more sizes and stored separately.

39-7.01B Aggregate Hot Storage

Aggregate for asphalt concrete to be mixed in batch mixing plants shall be stored, after being dried, in conformance with the following requirements:

1. Aggregates for asphalt concrete shall be separated into 3 or more sizes.
2. After the aggregate is separated, each size shall be stored in a separate bin, and shall be recombined in conformance with the provisions in Section 39-7.03A, "Proportioning for Batch Mixing," of this Section 11-1 in order to conform to the gradings specified in Section 39-2, "Materials," of this Section 11-1. Storage bins shall be provided with chutes to prevent overflow into adjacent bins.

39-7.01C Asphalt Binder Storage

Asphalt to be used as a binder for asphalt concrete shall be stored in heated tanks.

A suitable sampling device shall be provided in asphalt feed lines connecting plant storage tanks to the asphalt weighing system or spray bar. The sampling device shall consist of a valve with a nominal diameter between 10 mm and 20 mm, constructed in such a manner that a one-liter sample may be slowly withdrawn during plant operations. The valve shall be maintained in good condition and, if the valve fails to function properly, the valve shall be replaced. The sampling device shall be readily accessible and in an area free of dangerous obstructions and shall be between 600 mm and 750 mm above the platform. A drainage receptacle shall be provided for flushing the device prior to sampling.

The discharge end of the asphalt binder circulating pipe shall be maintained below the surface of the asphalt binder in the storage tank to prevent discharging hot asphalt binder into open air.

A temperature sensing device shall be installed in the asphalt feed line. The device shall measure the temperature of the asphalt and shall be accurate to 5˚C increments. An automatic, continuous recording device shall be provided and used to maintain accurate records of the asphalt temperature during production. Where the plant controller has the capability of capturing production data electronically, including ingredient temperatures, and when this data represents the temperature at the time of production and is captured at intervals of not greater than 5 minutes, this process will be considered to be continuous recording. Captured data shall be retained for the duration of the contract and shall be submitted to the Engineer on request.

39-7.02 DRYING

Aggregate shall be fed directly to a drier-drum mixer or to a drier at a uniform rate.

Aggregate shall be dried such that, at the time of spreading, the moisture content of the completed asphalt concrete mixture shall not exceed 1.0 percent and the minimum and maximum asphalt concrete mixture temperatures are not exceeded. Moisture content will be determined in conformity with the requirements of California Test 370.

The drier or drier-drum mixer shall be provided with a device that senses the temperature of the material leaving the drier or the drier-drum mixer. The temperature-sensing device shall be accurate to the nearest 5˚C. The indicator shall be located and maintained at the point where the proportioning operations are controlled. An automatic continuous recording device shall be provided and used to maintain accurate records of the temperatures during production. Where the plant controller has the capability of capturing production data electronically, including ingredient temperatures, and when this data represents the temperature at the time of production and is captured at intervals of not greater than 5 minutes, this process will be considered to be continuous recording. Captured data shall be retained for the duration of the contract and shall be submitted to the Engineer on request.

The burner used for heating the aggregate shall achieve complete combustion of the fuel.

39-7.03 PROPORTIONING

Proportioning shall be either by hot-feed control or cold-feed control. Hot-feed control and cold-feed control indicate the location of the measuring devices or controls.

The Contractor's mixing equipment shall be equipped with a suitable, safe sampling device that will provide a sample, representative of actual production, of the aggregate being incorporated into the asphalt concrete. The delivery point of samples shall be safe and convenient. When samples are taken from a location above ground level, a means shall be provided for lowering the aggregate samples to the ground.

39-7.03A Proportioning for Batch Mixing

When the Contractor elects to use batch mixing equipment, each aggregate hot storage bin shall be equipped with a sampling device that will provide a sample of the aggregate discharged into the weigh hopper.

Fine material collected in dust control systems, other than centrifugal collectors or knock-out boxes, shall be considered to be supplemental fine aggregate. When supplemental fine aggregate is used, it shall be proportioned by mass.

A sampling device for supplemental fine aggregate shall be installed in each feed line or surge tank preceding the weigh hopper.

39-7.03A(1) Batching Tolerances

Aggregate and asphalt shall be proportioned by mass as follows:

A. The zero tolerance for aggregate scales shall be 0.5-percent of the total batch mass of the aggregate. The zero tolerance for separate scales for weighing supplemental fine aggregate or asphalt binder shall be 0.05-percent of the total batch mass of the aggregate.
B. Unless otherwise approved by the Engineer, the indicated mass of material drawn from storage shall not vary from the preselected scale setting as defined by target values of the approved mix design by more than the following percentages of the total batch mass of the aggregate:

    1. Aggregate shall be within one percent, except that when supplemental fine aggregate is used and is weighed cumulatively with the aggregate, the draft of aggregate drawn immediately before the supplemental fine aggregate shall be within 0.5-percent.
    2. Supplemental fine aggregate shall be within 0.5-percent.
    3. Asphalt binder shall be within 0.1-percent.

The asphalt binder shall be measured by a tank scale.

39-7.03A(2) Automatic Controls

Batch proportioning shall be by an automatic plant controller. The proportioning devices shall be automatic to the extent that the only manual operation required for proportioning materials for one batch shall be a single operation of a switch or starter.

Proportioning devices shall be of a type in which materials discharged from the several bins are controlled by gates or by mechanical conveyors. The batching devices shall be so interlocked that no new batch may be started until weigh hoppers are empty, the scales are at zero, and the discharge gates are closed. The means of withdrawal from the bins and of discharge from the weigh box shall be interlocked so that not more than one bin can discharge onto a given scale at one time, and so that the weigh box cannot be tripped until the required quantity from each of the bins has been deposited therein. In addition, automatic proportioning devices shall be interlocked so that the weighing cycle will be interrupted whenever the amount of material drawn from storage varies from the pre-selected amount by more than the tolerances specified in this Section 11-1. Whenever the weighing cycle is interrupted, that specific batch shall not be used in the work unless it can be manually adjusted to meet the specified tolerances based on the total mass of the batch. When partial batches are batched, the interlock tolerances, except the zero tolerance, shall apply to the total mass of aggregate in the partial batch.

Proportioning devices shall be operated so that all mass increments required for a batch are preset at the same time. Controls shall be designed so that these settings may be changed without delay and the order of discharge from the several bins can be changed.

Proportioning controls shall be equipped with the means for inspection of the interlock tolerance settings. Instructions for performing the inspection shall be available at the point of operation.

The necessary means shall be provided to check the mass of various proportioned amounts on a separate vehicle scale located at the plant site.

39-7.03B Proportioning for Continuous Mixing

Asphalt binder shall be introduced into the mixer through a meter conforming to the provisions in Section 9-1.01, "Measurement of Quantities," of the Standard Specifications. The asphalt meter shall automatically compensate for changes in the asphalt temperature, unless the meter is the mass flow, coriolis effect, type. The system shall be capable of varying the rate of delivery of binder proportionate with the delivery of aggregate. During a day's run, the temperature of asphalt binder shall not vary more than 30˚C. The meter and lines shall be heated and insulated. The binder storage shall be equipped with a device for automatic plant cut-off when the level of binder is lowered sufficiently to expose the pump suction line.

When supplemental fine aggregate is used, it shall be proportioned by a method that uniformly feeds the material within 2 percent of the required amount. Supplemental fine aggregate shall be discharged from the proportioning device directly into the mixer.

The supplemental fine aggregate proportioning system shall function with a degree of accuracy such that, when operated between 30 percent and 100 percent of maximum operating capacity, the average difference between the indicated mass of material delivered and the actual mass delivered shall not exceed one percent of the actual mass for three individual 15-minute runs. For the 3 individual 15-minute runs, the indicated mass of material delivered shall not vary from the actual mass delivered by more than 2 percent of the actual mass.

The fine material collected in dust control systems may be returned to the aggregate production stream without proportioning if returned at a rate commensurate with overall plant production, and if returned at or before the mixer. A return rate of less than 100 percent of the collection rate shall be metered as specified above for supplemental fine aggregate.

The asphalt feeder, each of the aggregate feeders, the supplemental fine aggregate feeder, if used, and the combined aggregate feeder shall be equipped with devices by which the rate of feed can be determined while the plant is in full operation.

The combined aggregate shall be weighed using a belt scale. The belt scale shall be of such accuracy that, when the plant is operating between 30 percent and 100 percent of belt capacity, the average difference between the indicated mass of material delivered and the actual mass delivered shall not exceed one percent of the actual mass for three individual 3-minute runs. For the 3 individual 3-minute runs, the indicated mass of material delivered shall not vary from the actual mass delivered by more than 2 percent of the actual mass.

The actual mass of material delivered for proportioning device calibrations shall be determined by a vehicle scale located at the plant site conforming to the provisions in Section 9-1.01, "Measurement of Quantities," of the Standard Specifications. The vehicle scale shall be error checked within 24 hours of checking the plant's proportioning devices. The plant shall be equipped so that this accuracy check can be made prior to the first production operation for a project and at other times when requested by the Engineer.

The belt scale for the combined aggregate, the proportioning devices for supplemental fine aggregate, if used, and the asphalt proportioning meter shall be interlocked so that the rates of feed of the aggregates and asphalt will be adjusted automatically (at all production rates and production rate changes) to maintain the asphalt ratio (kilograms of asphalt per 100 kg of dry aggregate including supplemental fine aggregate, if used) designated in the mix design in conformance with the provisions in Section 39-2.03, "Asphalt Concrete Mixture," of this Section 11-1. The plant shall not be operated unless this automatic system is functioning and in good working condition.

Asphalt meters and aggregate belt scales used for proportioning aggregates and asphalt shall be equipped with rate-of-flow indicators to show the rates of delivery of asphalt and aggregate. Meters and scales shall be equipped with resettable totalizers so that the total amounts of asphalt and aggregate introduced into the asphalt concrete mixture can be determined. Rate-of-flow indicators and totalizers for like materials shall be accurate within one percent when compared directly. The asphalt cement totalizer shall not register when the asphalt metering system is not delivering material to the mixer.

The bin or bins containing the fine aggregate and supplemental fine aggregate, if used, shall be equipped with vibrating units or other equipment that will prevent hang-up of material while the plant is operating. Each belt feeder shall be equipped with a device to monitor the depth of aggregate between the troughing rollers. The device for monitoring depth of aggregate shall automatically shut down the plant whenever the depth of aggregate is less than 70 percent of the target depth. To avoid erroneous shut down by normal fluctuations, a delay between sensing less than 70 percent flow and shutdown of the plant will be permitted, as determined by the Engineer, at the time of the initial California Test 109. A second device shall be located either in the stream of aggregate beyond the belt or where it will monitor movement of the belt by detecting revolutions of the tail pulley on the belt feeder. The device for monitoring no-flow or belt movement, as the case may be, shall stop the plant automatically and immediately when there is no flow. The plant shall not be operated unless both low-flow and no-flow monitoring devices are in good working condition and functioning properly.

For continuous pugmill mixing plants, an aggregate sampling device that will provide a 25-kg to 40-kg sample of the combined aggregate while the plant is in full operation shall be provided in advance of the point where the aggregate enters the mixer.

For drier-drum mixing plants, an aggregate sampling device that will provide a 25-kg to 40-kg sample of the combined aggregate while the plant is in full operation shall be provided in advance of the point where the aggregate enters the drier-drum mixer.

When supplemental fine aggregate is used, a sampling device shall be installed in each feed line or surge tank preceding the proportioning device for the supplemental fine aggregate.

39-7.04 (BLANK)

39-7.05 MIXING

Aggregate, supplemental fine aggregate, and asphalt binder shall be mixed in a batch mixer, continuous mixing pugmill mixer, or continuous mixing drier-drum. The charge in a batch mixer, or the rate of feed to a continuous mixer, shall not exceed that which will permit complete mixing of the material. Dead areas in the mixer, in which the material does not move or is not sufficiently agitated, shall be corrected by a reduction in the volume of material or by other adjustments.

Asphalt binder shall be at a temperature of not less than 120°C nor more than 190°C when added to the aggregate.

The temperature of the aggregate before adding the binder shall not be more than 165°C.

39-7.05A Batch Mixing

When asphalt concrete is produced by batch mixing, the mixer shall be equipped with a sufficient number of paddles of a type and arrangement so as to produce a properly mixed batch.

The binder shall be introduced uniformly into the mixer along the center of the mixer parallel to the mixer shafts, or by pressure spraying. When a pan is used, it shall be equipped with movable vanes in order that the flow of binder may be directed across the width of the pan, as desired. The vanes shall be equipped with a means for quick adjustment, and a positive lock to prevent shifting.

The mixer platform shall be of ample size to provide safe and convenient access to the mixer and other equipment. The mixer housing and weighbox housing shall be equipped with gates of ample size to permit ready sampling of the discharge of aggregate from each of the plant bins and from each feed line or surge tank of supplemental fine aggregate, if used. The Contractor shall provide a sampling device capable of delivering a representative sample of sufficient size to permit the required tests.

The mixer shall be equipped with a timing device that will indicate by a definite audible or visual signal the expiration of the mixing period. The device shall measure the time of mixing within 2 seconds.

The time of mixing a batch shall begin on the charging stroke of the weighhopper dumping mechanism and shall end when discharge is started. Mixing shall continue until a homogeneous asphalt concrete mixture of uniformly distributed and properly coated aggregates of unchanging appearance is produced. The time of mixing shall be not less than 30 seconds.

An interval timer shall control the time of mixing. The interval timer shall be interlocked so that the mixer cannot be discharged until the materials have been mixed for the full amount of time specified.

39-7.05B Continuous Mixing

Continuous mixing plants shall utilize pugmill or drier-drum mixers.

When asphalt concrete is produced by pugmill mixing, the mixer shall be equipped with paddles of a type and arrangement to provide sufficient mixing action and movement to the asphalt concrete mixture to produce properly mixed asphalt concrete. The combined aggregate shall be fed directly from the drier to the mixer at a uniform and controlled rate.

Mixing shall continue until a homogeneous asphalt concrete mixture of thoroughly and uniformly coated aggregates of unchanging appearance is produced at the discharge point from the mixer.

The temperature of the completed asphalt concrete mixture shall not exceed 165°C upon discharge from the mixer.

The mixer shall discharge into a storage silo with a capacity of not less than that specified in Section 39-7.06, "Asphalt Concrete Storage," of this Section 11-1. The Contractor shall provide a means of diverting the flow of asphalt concrete away from the silo to prevent incompletely mixed portions of the asphalt concrete mixture from entering the silo.

39-7.06 ASPHALT CONCRETE STORAGE

When asphalt concrete is stored, it shall be stored only in silos. Asphalt concrete shall not be stockpiled. The minimum quantity of asphalt concrete in a silo during mixing shall be 18 tonnes except for the period immediately following a shut-down of the plant of 2 hours or more. A means shall be provided to indicate that storage in each silo is being maintained as required.

Storage silos shall be equipped with a surge-batcher sized to hold a minimum of 1800 kg of material. A surge-batcher consists of equipment placed at the top of the storage silo that catches the continuous delivery of the completed asphalt concrete mix and changes it to individual batch delivery to prevent the segregation of product ingredients as the completed asphalt concrete mix is placed into storage. The surge-batcher shall be center loading and shall be constructed to prevent material buildup. Rotary chutes shall not be used as surge-batchers.

The surge-batcher shall be independent and distinct from conveyors or chutes used to collect or direct the completed asphalt concrete mixture being discharged into storage silos and shall be the last device to handle the material before it enters the silo. Multiple storage silos shall be served by an individual surge-batcher for each silo. Material handling shall be free of oblique movement between the highest elevation (conveyor outfall) and subsequent placement in the silo. Discharge gates on surge-batchers shall be automatic in operation and shall discharge only after a minimum of 1800 kg of material has been

collected and shall close before the last collected material leaves the device. Discharge gate design shall prevent the deflection of material during the opening and closing operation.

Asphalt concrete stored in excess of 18 hours shall not be used in the work. Asphalt concrete mixture containing hardened lumps shall not be used. A storage facility that contained the material with the hardened lumps shall not be used for further storage until the cause of the lumps is corrected.

39-7.07 ASPHALT CONCRETE PLANTS

Plants, including commercial plants, that produce asphalt concrete subject to these specifications shall conform to the provisions in Section 7-1.01F, "Air Pollution Control," of the Standard Specifications, and shall be equipped with a wet-tube dust washer or equal and other devices that will reduce the dust emission to the degree that adjacent property is not damaged. The washer and other equipment shall function efficiently when the plant is in operation.

During production, petroleum products such as diesel fuel and kerosene shall not be used as a release agent on belts, conveyors, hoppers, or hauling equipment.

Plants shall be equipped with an inspection dock constructed so that a quality control technician or inspector standing on the dock can inspect the completed asphalt concrete mixture and take samples, as necessary, from the hauling vehicle before the vehicle leaves the plant site. This inspection dock shall allow the hauling vehicle to pull alongside and shall meet applicable safety requirements of the California Division of Occupational Safety and Health. Haul vehicle drivers shall be instructed to stop at the dock whenever a quality control technician or inspector is on the dock and to remain there until directed to leave by that individual.

39-8 SUBGRADE, PRIME COAT, PAINT BINDER (TACK COAT), AND PAVEMENT REINFORCING FABRIC

39-8.01 SUBGRADE

Immediately prior to applying prime coat or paint binder (tack coat), or immediately prior to placing the asphalt concrete when a prime coat or paint binder (tack coat) is not required, the subgrade to receive asphalt concrete shall conform to the compaction requirement and elevation tolerances specified for the material involved and shall be free of loose or extraneous material. If the asphalt concrete is to be placed on an existing base or pavement that was not constructed as part of the contract, the surface shall be cleaned by sweeping, flushing or other means to remove loose particles of paving, dirt, and other extraneous material immediately before applying the prime coat or paint binder (tack coat).

39-8.02 PRIME COAT AND PAINT BINDER (TACK COAT)

A prime coat of liquid asphalt shall be applied to the areas to be surfaced when there is a contract item for the work or when the work is required in "Asphalt Concrete" in Section 10-1, "General," of these special provisions.

Prime coat shall be applied only to those areas designated by the Engineer.

Prime coat shall be applied at the approximate total rate of 1.15 L per square meter of surface covered. The exact rate and number of applications will be determined by the Engineer.

Prime coat shall be applied at a temperature conforming to the range of temperatures specified in Section 93-1.03, "Mixing and Applying," of the Standard Specifications for distributor application of the grade of liquid asphalt being used.

A paint binder (tack coat) of asphaltic emulsion shall be furnished and applied in conformance with the provisions in Section 94, "Asphaltic Emulsions," of the Standard Specifications and shall be applied to vertical surfaces of existing pavement, curbs, gutters, and construction joints in the surfacing against which additional material is to be placed, to a pavement to be surfaced, and to other surfaces designated in "Asphalt Concrete" in Section 10-1, "General," of these special provisions.

Paint binder (tack coat) shall be applied in one application at a rate of from 0.10-L to 0.45-L per square meter of surface covered. The exact rate of application will be determined by the Engineer.

At the Contractor's option, paving asphalt may be used for paint binder (tack coat) instead of asphaltic emulsion. If paving asphalt is used, the grade to be used and the rate of application will be determined by the Engineer. The paving asphalt shall be applied at a temperature of not less than 140°C or more than 175°C.

Prime coat or paint binder (tack coat) shall be applied in advance of placing the surfacing only as far as shall be approved by the Engineer. When asphaltic emulsion is used as a paint binder (tack coat), the asphalt concrete shall not be placed until the asphaltic emulsion has cured.

Immediately in advance of placing asphalt concrete, additional prime coat or paint binder (tack coat) shall be applied as directed by the Engineer to areas where the prime coat or paint binder (tack coat) has been damaged. Loose or extraneous material shall be removed and no additional compensation will be allowed therefor.

39-8.03 PAVEMENT REINFORCING FABRIC

Pavement reinforcing fabric shall be placed on existing pavement to be surfaced or between layers of asphalt concrete when such work is shown on the plans, or specified in "Asphalt Concrete" in Section 10-1, of these special provisions, or ordered by the Engineer.

Immediately prior to placing binder, pavement reinforcing fabric, and asphalt concrete surfacing, the pavement shall be cleaned of loose and extraneous materials such as, but not limited to, vegetation, sand, dirt, gravel and water.

Before placing the pavement reinforcing fabric, a binder of paving asphalt Grade AR-8000 shall be applied uniformly to the surface to receive the pavement reinforcing fabric at a rate of not less than 1.15 L per square meter of surface covered. Pavement reinforcing fabric shall not be placed in areas of conform tapers when the thickness of the overlying asphalt concrete will be 40 mm or less. When pavement reinforcing fabric is placed in areas of conform tapers the binder shall be spread at the approximate rate of 1.4 L per square meter of surface covered. The exact rate will be determined by the Engineer. The binder shall be applied to a width equal to the width of the fabric mat plus 75 mm on each side.

Asphaltic emulsion shall not be substituted for paving asphalt binder for pavement reinforcing fabric.

Before applying binder, large cracks, spalls, and depressions in existing pavement shall be repaired as directed by the Engineer and, if not included in the item, the repair work will be paid for as extra work as provided in Section 4-1.03D of the Standard Specifications.

The pavement reinforcing fabric shall be aligned and placed with no wrinkles that lap. The test for lapping shall be made by gathering together the pavement reinforcing fabric in a wrinkle. If the height of the doubled portion of extra fabric is 15 mm or more, the fabric shall be cut to remove the wrinkle, then lapped in the direction of paving. Lap in excess of 50 mm shall be removed.

If manual laydown methods are used, the pavement reinforcing fabric shall be unrolled, aligned, and placed in increments of approximately 9 m.

Adjacent borders of the pavement reinforcing fabric shall be lapped 50 mm to 100 mm. The preceding roll shall be lapped 50 mm to 100 mm over the following roll in the direction of paving at ends of rolls or at a break. At pavement reinforcing fabric overlays, both the binder and the fabric shall overlap previously placed fabric by the same amount.

Seating of the pavement reinforcing fabric with rolling equipment after placing will be permitted. Turning of the paving machine and other vehicles shall be gradual and kept to a minimum to avoid damage to the fabric.

A small quantity of asphalt concrete, to be determined by the Engineer, may be spread over the pavement reinforcing fabric immediately in advance of placing asphalt concrete surfacing in order to prevent fabric from being damaged by construction equipment.

Pavement reinforcing fabric shall not be exposed to public traffic, Contractor's equipment or elements that will damage the fabric prior to placement of asphalt concrete surfacing, as determined by the Engineer. Public access cross traffic may be allowed to cross the fabric under traffic control after the Contractor has placed a small quantity of asphalt concrete over the fabric.

Care shall be taken to avoid tracking binder material onto the pavement reinforcing fabric or distorting the fabric during seating of the fabric with rolling equipment. If necessary to protect the pavement reinforcing fabric, exposed binder material may be covered lightly with sand.

39-9 SPREADING AND COMPACTING EQUIPMENT

39-9.01 SPREADING EQUIPMENT

Asphalt pavers shall be self-propelled mechanical spreading and finishing equipment provided with a screed or strike-off assembly capable of distributing the material to not less than the full width of a traffic lane unless otherwise approved by the Engineer. Screed action shall include cutting, crowding or other practical action that is effective on the asphalt concrete mixture without tearing, shoving or gouging and that produces a surface texture of uniform appearance. The screed shall be adjustable to the required section and thickness. The screed shall be provided with a suitable full width compacting device. Pavers that leave ridges, indentations or other marks in the surface shall not be used unless the ridges, indentations or marks are eliminated by rolling or prevented by adjustment in the operation.

When end dump haul vehicles are used, the asphalt paver shall operate independently of the vehicle being unloaded or shall be capable of propelling the vehicle being unloaded. The load of the haul vehicle shall be limited to that which will insure satisfactory spreading. While being unloaded, the haul vehicle shall be in contact with the machine and the brakes on the haul vehicle shall not be depended upon to maintain contact between the vehicle and the machine.

No portion of the mass of hauling or loading equipment, other than the connection, shall be supported by the asphalt paver. No vibrations or other motions of the loader that could have a detrimental effect on the riding quality of the completed pavement shall be transmitted to the paver.

When asphalt concrete is placed directly upon asphalt treated permeable base, the asphalt concrete shall be placed in a manner and with equipment that will not disturb or displace the asphalt treated permeable base.

39-9.02 COMPACTING EQUIPMENT

A sufficient number of rollers shall be provided to obtain the specified compaction and surface finish required by this Section 11-1. Rollers shall be sized to achieve the required results.

Rollers shall be equipped with pads and water systems that prevent sticking of the asphalt concrete mixtures to the pneumatic or steel-tired wheels. A parting agent that will not damage the asphalt concrete mixture may be used to aid in preventing the asphalt concrete mixture from sticking to the wheels.

39-10 SPREADING AND COMPACTING

39-10.01 GENERAL REQUIREMENTS

Asphalt concrete shall be handled, spread, and compacted in a manner which is in conformance with this Section 11-1, "Quality Control / Quality Assurance."

Asphalt concrete shall be placed in such a manner that cracking, shoving, and displacement will be avoided.

Type A and Type B asphalt concrete shall be placed only when the ambient temperature is above 10°C.

Asphalt concrete shall not be placed when the underlying layer or surface is frozen or not dry or when weather conditions will prevent proper handling, finishing or compaction of the mixture.

Asphalt concrete shall be spread and compacted in the layers and thicknesses indicated in the following table:

Asphalt Concrete Layers and Thickness

Total Thickness Shown on the Plans*	Number of Layers	Top Layer Thickness (Millimeters)		Next Lower Layer Thickness (Millimeters)		All Other Lower Layers Thickness (Millimeters)	
		Min.	Max.	Min.	Max.	Min.	Max.
75 mm or less	1	----	-----	----	----	----	----
76 through 89 mm	2	35	45	35	45	----	----
90 through 135 mm	2	45	60	45	75	—	—
136 mm or more	**	45	60	45	75	45	120

Notes:
*When pavement reinforcing fabric is shown to be placed between layers of asphalt concrete, the thickness of asphalt concrete above the pavement reinforcing fabric shall be considered to be the "Total Thickness Shown on the Plans" for the purpose of spreading and compacting the asphalt concrete above the pavement reinforcing fabric.
**At least 3 layers if total thickness is more than 135 mm and less than 255 mm. At least 4 layers if total thickness is 255 mm or more.

A layer shall not be placed over a layer that exceeds 75 mm in compacted thickness until the temperature of the layer being covered is less than 70°C at mid-depth unless approved by the Engineer.

Asphalt concrete to be placed on shoulders, and on other areas off the traveled way having a width of 1.50 m or more, shall be spread in the same manner as specified above.

The completed mixture shall be deposited on the roadbed at a uniform quantity per linear meter, as necessary to provide the required compacted thickness without resorting to spotting, picking-up or otherwise shifting the mixture. During transporting, spreading and compacting, petroleum products such as diesel fuel and kerosene shall not be used as a release agent on trucks, spreaders or compactors in contact with the asphalt concrete.

Segregation shall be avoided. Surfacing shall be free from pockets of coarse or fine material. Asphalt concrete containing hardened lumps shall not be used.

Longitudinal joints in the top layer of Type A or Type B asphalt concrete shall correspond with the edges of planned traffic lanes. Longitudinal joints in other layers shall be offset not less than 150 mm alternately each side of the edges of traffic lanes.

Unless otherwise provided herein or approved by the Engineer, the top layer of asphalt concrete for shoulders, tapers, transitions, road connections, private drives, curve widenings, chain control lanes, turnouts, left-turn pockets, and other areas shall not be spread before the top layer of asphalt concrete for the adjoining through lane has been spread and compacted. At locations where the number of lanes is changed, the top layer for the through lanes shall be paved first. When existing pavement is to be surfaced and the specified thickness of asphalt concrete to be spread and compacted on the existing pavement is 75 mm or less, the shoulders or other adjoining areas may be spread simultaneously with the through lane

provided the completed surfacing conforms to the requirement of this Section 11-1. Tracks or wheels of spreading equipment shall not be operated on the top layer of asphalt concrete until final compaction has been completed.

At those locations shown on the plans, as specified in "Asphalt Concrete" in Section 10-1, "General," of these special provisions, or as directed by the Engineer, the asphalt concrete shall be tapered or feathered to conform to existing surfacing or to other highway and non-highway facilities.

At locations where the asphalt concrete is to be placed over areas inaccessible to spreading and rolling equipment, the asphalt concrete shall be spread by practical means to obtain the specified results and shall be compacted thoroughly to the required lines, grades, and cross sections by means of pneumatic tampers or by other methods that will produce the same degree of compaction as pneumatic tampers.

39-10.02 PRODUCTION START-UP EVALUATION AND NUCLEAR DENSITY TEST STRIPS

The Contractor shall demonstrate that the proposed asphalt concrete mixture is being produced and placed on the roadway in conformance with this Section 11-1, "Quality Control / Quality Assurance." The production start-up evaluation shall demonstrate that the aggregates and asphalt concrete mixture conform to the requirements of Table 39-3, "Asphalt Concrete Mixture Requirements," and of Table 39-9, "Minimum Quality Control Requirements," of this Section 11-1 when produced using the plant proposed for this project. The nuclear density test strip serves to provide the Contractor with a location to develop a correlation between cores taken from the test strip and the Contractor's and Engineer's nuclear density gage readings taken from the same locations on the test strip and for the Contractor to demonstrate the ability to achieve a minimum of 96 percent relative compaction.

Production start-up evaluation and the nuclear density test strip may be constructed separately or at the same time to serve both purposes. Asphalt concrete used in the nuclear density test strip shall be representative of the asphalt concrete that shall be placed in the project.

Should the test results or testing program fail to meet these criteria, production will be suspended and the Contractor shall resolve the problem in conformance with the provisions in Section 39-6, "Dispute Resolution," of this Section 11-1.

Attention is directed to longitudinal and transverse construction joint requirements specified in "Asphalt Concrete" in Section 10-1, "General," of these special provisions.

Test data used for the production start up evaluation and the nuclear gage test strips shall not be included with the test data used for acceptance of the work in conformance with the provisions in Section 39-11, "Acceptance of Work," of this Section 11-1.

A production start-up evaluation and a nuclear density test strip shall be used when production of asphalt concrete has been resumed following a suspension of production due to unsatisfactory material quality as specified in Section 39-4.04, "Contractor Process Control," Section 39-4.05, "Contractor Quality Control," and Section 39-11.02A, "General" of this Section 11-1.

39-10.02A Production Start-Up Evaluation

Before or on the first day of asphalt concrete production, the Contractor shall produce a trial quantity of between 250 tonnes and 500 tonnes of asphalt concrete to demonstrate that asphalt concrete produced for this project conforms to the quality characteristics of this Section 11-1. The location of the production start-up evaluation shall be approved by the Engineer.

Asphalt concrete shall be produced by production procedures intended for the entire project. Production of asphalt concrete shall stop after placement of the trial quantity of asphalt concrete. Asphalt concrete production and placement may resume after the quality characteristics of the asphalt concrete mixture have been tested and found to be in conformance with the quality requirements of this Section 11-1.

The Contractor shall randomly obtain 3 aggregate samples from the plant and 3 asphalt concrete mixture samples from the mat behind the paver. Each sample from the plant shall be split into 4 portions; each sample from the mat shall be split into 4 portions. One portion of each sample shall be tested by the Contractor and one portion of each sample shall be provided to the Engineer for testing. The remaining portions shall be delivered to the Engineer and stored for dispute resolution should the test results not conform to this Section 11-1. The Contractor and the Engineer shall evaluate the samples for conformance to the requirements for sand equivalent, stability, percent air voids, and the quality characteristics designated in Table 39-9, "Minimum Quality Control Requirements," of this Section 11-1. The percent air voids of the asphalt concrete mixture shall be within ± 1.0 percent of the percent air voids designated in the Contractor's mix design.

The trial quantity of asphalt concrete will be accepted if:

A. Not more than 3 of the test results from the combined 6 test results from the Contractor's and Engineer's samples for quality characteristics indexed 2, 3, 4, and 5 in Table 39-9, "Minimum Quality Control Requirements," of this Section 11-1 are outside the specified limits.

B. Not more than one of the test results from the combined 6 test results from the Contractor's and the Engineer's samples for sand equivalent, stability, percent air voids or critical start-up characteristics designated in Table 39-9, "Minimum Quality Control Requirements," of this Section 11-1 are outside the specified limits.

If the test results from the combined 6 test results fail to meet the conditions above, corrective action shall be taken, and a new trial quantity of asphalt concrete shall be placed and evaluated in conformance with the provisions in this section to demonstrate conformance. If the test results from the combined 6 test results fail to meet the requirements above, then the trial quantity of asphalt concrete will be rejected.

The testing program will be considered adequate only if the average of the Contractor's test results and the average of the Engineer's test results for sand equivalent, stability, percent air voids, and the quality characteristics designated in Table 39-9, "Minimum Quality Control Requirements," of this Section 11-1 are within the allowable testing difference designated in Table 39-6, "Allowable Testing Difference," of this Section 11-1.

The Contractor shall not proceed to regular production until the requirements of this Section 39-10.02A, "Production Start-Up Evaluation" have been met. At the request of the Contractor, the Engineer may elect to leave the asphalt concrete which does not meet the requirements of this Section 39-10.02A in place if mitigation at the Contractor's expense can be agreed to. If this quantity of asphalt concrete is left in place, the Contractor will be paid 75 percent of the contract price paid per tonne for asphalt concrete.

The Contractor shall establish a correlation factor for stability of cured versus uncured briquettes. From a single split sample of asphalt concrete, 6 briquettes shall be fabricated. Three of the 6 briquettes shall be cured for 15 hours in conformance with the requirements of California Test 366 and 3 briquettes shall not be cured. The difference between the average stability value determined for the cured and the uncured specimens shall be considered the correlation factor, and shall be applied to stability values determined on uncured samples throughout the life of the project. The correlation factor may range from zero to 4. If the correlation factor is less than zero, a factor of zero shall be applied. If the factor is greater than 4, the correlation factor shall be approved by the Engineer.

39-10.02B Nuclear Density Test Strip

On the first day of placement of each layer of asphalt concrete the Contractor shall place a test strip in conformance with the requirements of California Test 375. The purpose of the test strip is to determine a correlation between cores taken from the test strip and the nuclear density gage readings taken at the core locations and to demonstrate that the asphalt concrete can be placed and compacted to the standards of this Section 11-1, "Quality Control / Quality Assurance." Asphalt concrete used in the nuclear density test strip shall be representative of the asphalt concrete that shall be placed in the project. The location for the nuclear density test strip shall be approved by the Engineer.

The Contractor shall place nuclear density test strips until conditions of the test method and this Section 11-1 have been met. The requirements of this section and the test method shall apply for the correlation of each gage that is used to determine relative compaction for this project. Relative compaction results will not be accepted if they have been determined using a nuclear gage that has not been correlated using a test strip.

Asphalt concrete in test strips may be left in place under the following conditions:

A. If the relative compaction for the test strip is determined to be 96 percent or greater, the Contractor will be paid at the contract price per tonne of asphalt concrete.
B. If the relative compaction for the test strip is determined to be less than 96 percent but greater than 93 percent, the Contractor will be paid at 75 percent of the contract price per tonne of asphalt concrete. A new test strip will be required, and mitigation measures shall be at Contractor's expense.

Asphalt concrete in test strips will be rejected when the relative compaction for the test strip is below 93 percent. Production and placement shall not begin until the Contractor has demonstrated the ability to achieve 96 percent relative compaction in conformance with this Section 11-1.

39-10.03 SPREADING

Layers shall be spread with an asphalt paver, unless otherwise specified or approved by the Engineer. Asphalt pavers shall be operated in such a manner as to insure continuous and uniform movement of the paver.

In advance of spreading asphalt concrete over an existing base, surfacing or bridge deck, if there is a contract item for asphalt concrete (leveling) or if ordered by the Engineer, asphalt concrete shall be spread by mechanical means that will produce a uniform smoothness and texture. Asphalt concrete (leveling) shall include, but not be limited to, the filling and leveling of irregularities and ruts. Asphalt concrete used to change the cross slope or profile of an existing surface shall not be considered as asphalt concrete (leveling).

Paint binder (tack coat) shall be applied to each layer in advance of spreading the next layer.

Before placing the top layer adjacent to cold transverse construction joints, the joints shall be trimmed to a vertical face on a neat line. Transverse joints shall be tested with a 3.6-m ± 0.06-m straightedge and shall be cut back for surface smoothness as required in conformance with Section 39-10.04, "Compacting," of this Section 11-1. Connections to existing surfacing shall be feathered to conform to the requirements for smoothness. Longitudinal joints shall be trimmed to a vertical face and on a neat line if the edges of the previously laid surfacing are, in the opinion of the Engineer, in such a condition that the quality of the completed joint will be affected.

39-10.04 COMPACTING

Compacting equipment shall conform to the provisions in Section 39-9.02, "Compacting Equipment," of this Section 11-1, "Quality Control / Quality Assurance."

Rolling shall commence at the lower edge and shall progress toward the highest portion. When compacting layers that exceed 75 mm in compacted thickness, rolling shall commence at the center and shall progress outwards.

Asphalt concrete shall be compacted to a relative compaction of not less than 96 percent and shall be finished to the lines, grades, and cross sections shown on the plans. In-place density of asphalt concrete will be determined prior to opening the pavement to public traffic. No rolling will be permitted after the asphalt concrete temperature is below 60°C.

Asphalt concrete placed in dig outs, as a leveling course, for slope correction, for detours not included in the finished roadway prism, in areas where in the judgment of the Engineer compaction or compaction measurement by conventional methods is impeded or on the uppermost lift of shoulders with rumble strips shall be compacted by a method approved by the Engineer.

Relative compaction shall be determined in conformance with the requirements of California Test 375 except that only a nuclear gauge with thin lift capability shall be used for asphalt concrete layer of 30 mm to 59 mm in thickness. Laboratory specimens shall be compacted in conformance with the requirements of California Test 304. Test locations will be established for asphalt concrete areas to be tested, as specified in California Test 375. If the Contractor compacts the asphalt concrete in any form or quantity after sites for testing have been chosen in conformance with the requirements of California Test 375 or after California Test 375 has begun, the quality control tester shall choose a new set of random numbers for locating test sites.

Upon completion of rolling operations, if ordered by the Engineer, the asphalt concrete shall be cooled by applying water. Applying water shall conform to the provisions in Section 17, "Watering," of the Standard Specifications.

The completed surfacing shall be thoroughly compacted, smooth, and free from ruts, humps, depressions, or irregularities. Ridges, indentations or other objectionable marks left in the surface of the asphalt concrete by blading or other equipment shall be eliminated by rolling or other suitable means. The use of equipment that leaves ridges, indentations or other objectionable marks in the asphalt concrete shall be discontinued.

When a straightedge 3.6 m ± 0.06-m long is laid on the finished surface and parallel with the centerline, the surface shall not vary more than 3-mm from the lower edge of the straightedge. The transverse slope of the finished surface shall be uniform to a degree such that no depressions greater than 6 mm are present when tested with a straightedge 3.6 m ± 0.06-m long in a direction transverse to the centerline and extending from edge to edge of a 3.6-m traffic lane.

Pavement within 15 m of a structure or approach slab shall conform to the smoothness tolerances specified in Section 51-1.17, "Finishing Bridge Decks," of the Standard Specifications.

39-11 ACCEPTANCE OF WORK

39-11.01 GENERAL

The Engineer shall select the procedure used to determine the quantities of asphalt concrete for acceptance and payment determination in conformance with the provisions of this Section 11-1, "Quality Control / Quality Assurance."

Quality control test results that have been verified shall form the basis for statistical evaluation of the work in conformance with Section 39-11.02, "Statistical Evaluation and Determination of Pay Factor," of this Section 11-1. The quality requirements on which statistical evaluation will be based are specified in Table 39-9, "Minimum Quality Control Requirements," of this Section 11-1.

Work determined to be in conformance with the provisions of this Section 11-1 will be accepted and paid for at the contract price per tonne for asphalt concrete and may be subject to compensation adjustment in conformance with Section 39-11.02C, "Pay Factor Determination and Compensation Adjustment," of this Section 11-1.

Work that is not in compliance with the provisions of this Section 11-1 may be rejected by the Engineer and shall be removed and replaced at the Contractor's expense.

When there are fewer than 5 verified quality control tests, the work will be accepted or rejected based on whether the individual test results meet the quality requirements specified in Table 39-9, "Minimum Quality Control Requirements," of this Section 11-1. Section 39-11.02, "Statistical Evaluation and Pay Factor Determination," of this Section 11-1 shall not apply.

Aggregates, asphalt binder, and asphalt concrete mixtures that do not conform to this Section 11-1 shall not be used.

The Engineer may reject a quantity of material that is determined to be defective based on visual inspection or noncompliance with the provisions of this Section 11-1.

39-11.02 STATISTICAL EVALUATION AND DETERMINATION OF PAY FACTOR

Statistical evaluation of the work shall be used to verify the Contractor's quality control test results to determine compliance with this Section 11-1, "Quality Control / Quality Assurance."

39-11.02A General

The quality characteristics to be evaluated and the specification limits are specified in Table 39-9, "Minimum Quality Control Requirements," of this Section 11-1. Asphalt content, aggregate gradation (600-µm and 75-µm sieves), and relative compaction shall be considered for purposes of this Section 11-1 to be critical quality characteristics.

A lot represents the total quantity of asphalt concrete placed. More than one lot will occur if changes in the target values, material sources or mix design are requested by the Contractor and made in conformance with this Section 11-1 or if production of asphalt concrete is suspended due to unsatisfactory performance. However, asphalt concrete placed in dig outs, as a leveling course, for slope correction, for detours not to be included in the finished roadway prism, in areas where in the judgment of the Engineer compaction or compaction measurement by conventional methods is impeded or on the uppermost lift of shoulders with rumble strips shall be considered as a separate lot from other asphalt concrete. In addition, a new lot may be designated by the Engineer if the production and placement have been suspended for longer than 30 days due to seasonal suspension of phases of work.

A minimum of 5 samples shall be required to perform a statistical evaluation. The maximum obtainable pay factor with the 5 samples shall be 1.01. A minimum of 8 samples shall be required to obtain a pay factor of 1.05. If the sampling frequencies and quantity of work would otherwise result in fewer than 8 samples, the Contractor may submit a written request to increase the sampling frequency to provide a minimum of 8 samples. The request shall be included in the Quality Control Plan.

The lot will be accepted and a final pay factor determined when the Contractor's sampling, inspection, and test results are completed, have been submitted and evaluated, and the Engineer has visually inspected the pavement. Quality control test results shall be verified using the *t*-test in conformance with the provisions of Section 39-5.03, "Verification," of this Section 11-1 before the results will be used in considering the acceptance of asphalt concrete.

If the current composite pay factor of a lot is greater than 0.90, the lot will be accepted, provided the lowest single pay factor is not within the reject portion of Table 39-8, "Pay Factors," of this Section 11-1. If the lowest single pay factor is within the reject portion of Table 39-8, "Pay Factors," of this Section 11-1, the lot will be rejected. Rejected asphalt concrete shall be removed from the project site at the Contractor's expense.

If the current composite pay factor of a lot is less than 0.90, production of asphalt concrete shall be terminated and corrective action taken. Upon approval of the Engineer, up to 1000 tonnes of asphalt concrete may be placed to demonstrate that the asphalt concrete is once again in conformance with this Section 11-1. Production of asphalt concrete shall not start until the Engineer has received test results confirming conformance with this Section 11-1. A new lot will be established when production resumes.

If a pay factor for a critical quality characteristic designated in Table 39-9, "Minimum Quality Control Requirements," of this Section 11-1 is less than 0.90 for the lot or is within the rejection range for the last 5 tests, production of asphalt concrete shall be terminated and corrective action taken. Upon approval of the Engineer, up to 1000 tonnes of asphalt concrete may be placed to demonstrate that the asphalt concrete is once again in conformance with this Section 11-1. Production of asphalt concrete shall not start until the Engineer has received test results confirming conformance with this Section 11-1. A new lot will be established when production resumes.

Defective asphalt concrete may be voluntarily removed and replaced with new asphalt concrete to avoid a low pay factor. New material will be sampled, tested, and evaluated in conformance with this Section 11-1.

39-11.02B Statistical Evaluation

The Variability-Unknown/Standard Deviation Method will be used to determine the estimated percentage of the lot that is outside specification limits. The number of significant figures used in the calculations will be in conformance with the requirements of AASHTO Designation R-11, Absolute Method.

The estimated percentage of work that is outside of the specification limits for each quality characteristic will be determined as follows:

1. Calculate the arithmetic mean ($\overline{X}$) of the test values;

$$\overline{X} = \frac{\Sigma x}{n}$$

where:

$\sum$	=	summation of
x	=	individual test values
n	=	total number of test values

2. Calculate the standard deviation (s);

$$s = \sqrt{\frac{n\Sigma (x^2)-(\Sigma x)^2}{n(n-1)}}$$

where:

$\sum(x^2)$	=	summation of the squares of individual test values
$(\sum x)^2$	=	summation of the individual test values squared
n	=	total number of test values

3. Calculate the upper quality index (Q_u);

$$Q_u = \frac{USL - \overline{X}}{s}$$

where:

USL	=	upper specification limit
s	=	standard deviation
$\overline{X}$	=	arithmetic mean

(Note: The USL is equal to the upper specification limit or the target value plus the production tolerance.)

4. Calculate the lower quality index (Q_L);

$$Q_L = \frac{\overline{X} - LSL}{s}$$

where:

LSL=		lower specification limit or target value minus production tolerance
s	=	standard deviation
$\overline{X}$	=	arithmetic mean

5. From Table 39-7, "Estimated Percent of Work Outside Specification Limits," of this Section 11-1, determine P_U ;

where:

P_U = the estimated percentage of work outside the USL.
(P_U = 0, when USL is not specified.)

6. From Table 39-7, "Estimated Percent of Work Outside Specification Limits," of this Section 11-1, determine P_L;

where:

P_L = the estimated percentage of work outside the LSL.
(P_L = 0, when LSL is not specified.)

7. Calculate the total estimated percentage of work outside the USL and LSL, Percent Defective;

Percent Defective = $P_U + P_L$

where:

P_U = the estimated percentage of work outside the USL

P_L = the estimated percentage of work outside the LSL

8. Repeat Steps 1 through 7 for each quality characteristic listed for acceptance.

39-11.02C Pay Factor Determination and Compensation Adjustment

The pay factor and compensation adjustment for a lot will be determined as follows:

1. From Table 39-8, "Pay Factors," of this Section 11-1, determine the pay factor for each quality characteristic, (PF_{QC}), using the total number of test result values and the total estimated percentage outside the specification limits ($P_U + P_L$) from Step 7 in Section 39-11.02B, "Statistical Evaluation," of this Section 11-1.
2. The pay factor for the lot is a composite of single pay factors determined for each quality characteristic designated in Table 39-9, "Minimum Quality Control Requirements," of this Section 11-1. The following formula is used:

$$PF_C = \sum_{i=1}^{8} w_i \, PF_{QC_i}$$

where:

PF_C = the composite pay factor for the lot,

PF_{QC} = the pay factor for the individual quality characteristic,

w = the weighting factor listed in Table 39-9, and

i = the quality characteristic index number in Table 39-9.

3. Payment to the Contractor for the lot of asphalt concrete will be subject to a compensation adjustment. The Compensation Adjustment Factor (CAF) will be determined as follows:

$CAF = PF_C - 1$

4. The amount of the compensation adjustment will be calculated as the product of:

a. the Compensation Adjustment Factor (CAF)
b. the total tonnes represented in the lot, and
c. the contract price paid per tonne for the item of asphalt concrete involved.

If the compensation adjustment is a negative value, the compensation adjustment will be deducted from moneys due, or that may become due, the Contractor under the contract. If the compensation adjustment is a positive value, the compensation adjustment will be added to moneys due, or that may become due, the Contractor under the contract.

Table 39-7.—ESTIMATED PERCENT OF WORK OUTSIDE SPECIFICATION LIMITS

P_U and/or P_L	Sample Size (n)												
	5	6	7	8	9	10-11	12-14	15-17	18-22	23-29	30-42	43-66	>66
	Upper Quality Index Q_U or Lower Quality Index Q_L												
0	1.72	1.88	1.99	2.07	2.13	2.20	2.28	2.34	2.39	2.44	2.48	2.51	2.56
1	1.64	1.75	1.82	1.88	1.91	1.96	2.01	2.04	2.07	2.09	2.12	2.14	2.16
2	1.58	1.66	1.72	1.75	1.78	1.81	1.84	1.87	1.89	1.91	1.93	1.94	1.95
3	1.52	1.59	1.63	1.66	1.68	1.71	1.73	1.75	1.76	1.78	1.79	1.80	1.81
4	1.47	1.52	1.56	1.58	1.60	1.62	1.64	1.65	1.66	1.67	1.68	1.69	1.70
5	1.42	1.47	1.49	1.51	1.52	1.54	1.55	1.56	1.57	1.58	1.59	1.59	1.60
6	1.38	1.41	1.43	1.45	1.46	1.47	1.48	1.49	1.50	1.50	1.51	1.51	1.52
7	1.33	1.36	1.38	1.39	1.40	1.41	1.41	1.42	1.43	1.43	1.44	1.44	1.44
8	1.29	1.31	1.33	1.33	1.34	1.35	1.35	1.36	1.36	1.37	1.37	1.37	1.38
9	1.25	1.27	1.28	1.28	1.29	1.29	1.30	1.30	1.30	1.31	1.31	1.31	1.31
10	1.21	1.23	1.23	1.24	1.24	1.24	1.25	1.25	1.25	1.25	1.25	1.26	1.26
11	1.18	1.18	1.19	1.19	1.19	1.19	1.20	1.20	1.20	1.20	1.20	1.20	1.20
12	1.14	1.14	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15
13	1.10	1.10	1.10	1.10	1.10	1.10	1.11	1.11	1.11	1.11	1.11	1.11	1.11
14	1.07	1.07	1.07	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
15	1.03	1.03	1.03	1.03	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
16	1.00	0.99	0.99	0.99	0.99	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
17	0.97	0.96	0.95	0.95	0.95	0.95	0.94	0.94	0.94	0.94	0.94	0.94	0.94
18	0.93	0.92	0.92	0.92	0.91	0.91	0.91	0.91	0.90	0.90	0.90	0.90	0.90
19	0.90	0.89	0.88	0.88	0.88	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
20	0.87	0.86	0.85	0.85	0.84	0.84	0.84	0.83	0.83	0.83	0.83	0.83	0.83
21	0.84	0.82	0.82	0.81	0.81	0.81	0.80	0.80	0.80	0.80	0.80	0.80	0.79
22	0.81	0.79	0.79	0.78	0.78	0.77	0.77	0.77	0.76	0.76	0.76	0.76	0.76
23	0.77	0.76	0.75	0.75	0.74	0.74	0.74	0.73	0.73	0.73	0.73	0.73	0.73
24	0.74	0.73	0.72	0.72	0.71	0.71	0.70	0.70	0.70	0.70	0.70	0.70	0.70
25	0.71	0.70	0.69	0.69	0.68	0.68	0.67	0.67	0.67	0.67	0.67	0.67	0.66

Table continues below

Table 39-7 (cont.).—ESTIMATED PERCENT OF WORK OUTSIDE SPECIFICATION LIMITS

P_U and/or P_L	Sample Size (n)												
	5	6	7	8	9	10-11	12-14	15-17	18-22	23-29	30-42	43-66	>66
	Upper Quality Index Q_U or Lower Quality Index Q_L												
26	0.68	0.67	0.67	0.65	0.65	0.65	0.64	0.64	0.64	0.64	0.64	0.64	0.63
27	0.65	0.64	0.63	0.62	0.62	0.62	0.61	0.61	0.61	0.61	0.61	0.61	0.60
28	0.62	0.61	0.60	0.59	0.59	0.59	0.58	0.58	0.58	0.58	0.58	0.58	0.57
29	0.59	0.58	0.57	0.57	0.56	0.56	0.55	0.55	0.55	0.55	0.55	0.55	0.54
30	0.56	0.55	0.54	0.54	0.53	0.53	0.52	0.52	0.52	0.52	0.52	0.52	0.52
31	0.53	0.52	0.51	0.51	0.50	0.50	0.50	0.49	0.49	0.49	0.49	0.49	0.49
32	0.50	0.49	0.48	0.48	0.48	0.47	0.47	0.47	0.46	0.46	0.46	0.46	0.46
33	0.47	0.48	0.45	0.45	0.45	0.44	0.44	0.44	0.44	0.43	0.43	0.43	0.43
34	0.45	0.43	0.43	0.42	0.42	0.42	0.41	0.41	0.41	0.41	0.41	0.41	0.40
35	0.42	0.40	0.40	0.39	0.39	0.39	0.38	0.38	0.38	0.38	0.38	0.38	0.38
36	0.39	0.38	0.37	0.37	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36
37	0.36	0.35	0.34	0.34	0.34	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.32
38	0.33	0.32	0.32	0.31	0.31	0.31	0.30	0.30	0.30	0.30	0.30	0.30	0.30
39	0.30	0.30	0.29	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28
40	0.28	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
41	0.25	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23
42	0.23	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
43	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18
44	0.16	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
45	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13
46	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
47	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
48	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
49	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Notes:

1. If the value of Q_U or Q_L does not correspond to a value in the table, use the next lower value.
2. If Q_U or Q_L are negative values, P_U or P_L is equal to 100 minus the table value for P_U or P_L.

Table 39-8.—PAY FACTOR

Pay Factor	Sample Size (n)												
	5	6	7	8	9	10-11	12-14	15-17	18-22	23-29	30-42	43-66	>66
	Maximum Allowable Percent of Work Outside Specification Limits for A Given Pay Factor ($P_U + P_L$)												
1.05				0	0	0	0	0	0	0	0	0	0
1.04			0	1	3	5	4	4	4	3	3	3	3
1.03		0	2	4	6	8	7	7	6	5	5	4	4
1.02		1	3	6	9	11	10	9	8	7	7	6	6
1.01	0	2	5	8	11	13	12	11	10	9	8	8	7
1.00	22	20	18	17	16	15	14	13	12	11	10	9	8
0.99	24	22	20	19	18	17	16	15	14	13	11	10	9
0.98	26	24	22	21	20	19	18	16	15	14	13	12	10
0.97	28	26	24	23	22	21	19	18	17	16	14	13	12
0.96	30	28	26	25	24	22	21	19	18	17	16	14	13
0.95	32	29	28	26	25	24	22	21	20	18	17	16	14
0.94	33	31	29	28	27	25	24	22	21	20	18	17	15
0.93	35	33	31	29	28	27	25	24	22	21	20	18	16
0.92	37	34	32	31	30	28	27	25	24	22	21	19	18
0.91	38	36	34	32	31	30	28	26	25	24	22	21	19
0.90	39	37	35	34	33	31	29	28	26	25	23	22	20
0.89	41	38	37	35	34	32	31	29	28	26	25	23	21
0.88	42	40	38	36	35	34	32	30	29	27	26	24	22
0.87	43	41	39	38	37	35	33	32	30	29	27	25	23
0.86	45	42	41	39	38	36	34	33	31	30	28	26	24
0.85	46	44	42	40	39	38	36	34	33	31	29	28	25
0.84	47	45	43	42	40	39	37	35	34	32	30	29	27
0.83	49	46	44	43	42	40	38	36	35	33	31	30	28
0.82	50	47	46	44	43	41	39	38	36	34	33	31	29
0.81	51	49	47	45	44	42	41	39	37	36	34	32	30
0.80	52	50	48	46	45	44	42	40	38	37	35	33	31
0.79	54	51	49	48	46	45	43	41	39	38	36	34	32
0.78	55	52	50	49	48	46	44	42	41	39	37	35	33
0.77	56	54	52	50	49	47	45	43	42	40	38	36	34
0.76	57	55	53	51	50	48	46	44	43	41	39	37	35
0.75	58	56	54	52	51	49	47	46	44	42	40	38	36
	60	57	55	53	52	51	48	47	45	43	41	40	37
	61	58	56	55	53	52	50	48	46	44	43	41	38
Reject	62	59	57	56	54	53	51	49	47	45	44	42	39
	63	61	58	57	55	54	52	50	48	47	45	43	40
	64	62	60	58	57	55	53	51	49	48	46	44	41
Reject Values Greater Than Those Shown Above													

Notes:

1. To obtain a pay factor when the estimated percent outside specification limits from Table 39-7, "Estimated Percent of Work Outside Specification Limits," does not correspond to a value in the table, use the next larger value.
2. The maximum obtainable pay factor is 1.05 (with a minimum of 8 test values).

Table 39-9.—MINIMUM QUALITY CONTROL REQUIREMENTS

Index (i)	Quality Characteristic	Specification Limits	Weighting Factor (w)	California Test	Minimum Sampling and Testing Frequency	Point of Sampling
1	**Asphalt Content** [2,3]	TV ± 0.5%	0.30	379 or 382	One sample per 500 tonnes or part thereof Not less than one sample per day	Mat behind paver
	Gradation			202	One sample per 500 tonnes or part thereof Not less than one sample per day	Batch Plant - from hot bins Drum Plant - from cold feed
2	19 or 12.5 mm [4]	TV ± 5	0.01			
3	9.5 mm	TV ± 6	0.01			
4	4.75 mm	TV ± 7	0.05			
5	2.36 mm	TV ± 5	0.05			
6	600 µm [2,3]	TV ± 4	0.08			
7	75 µm [2]	TV ± 2	0.10			
8	**Relative Compaction** [2]	96%	0.40	375 [5]	One sample per 500 tonnes or part thereof Not less than one test per day	Finished mat after final rolling
	Test Maximum Density			375	Per Test Method	Mat behind the paver
9	**Mix Moisture Content**	≤1%		370	One sample per 1000 tonnes or part thereof Not less than one sample per day	
	Asphalt and Mix Temperature	120ºC to 190ºC (Asphalt) ≤165ºC (Mix)			Continuous using an automated recording device	Plant

Notes:

1. TV = Target Value from contractor's proposed mix design.
2. Depending on aggregate gradation specified.
3. Quality characteristics 1, 6, 7, and 8 are defined as critical quality characteristics in the verification testing process.
4. Quality characteristics 1, 6, and 7 are defined as critical start-up characteristics in the Production Start-Up Evaluation.
5. California Test 375, Part 3, Section B, "Testing Frequency," is revised to change 450 tonnes to 500 tonnes and 45 tonnes to 50 tonnes.

39-12 MEASUREMENT AND PAYMENT

39-12.01 MEASUREMENT

Asphalt concrete will be measured by mass. The quantity to be paid for will be the combined mass of the mixture for the various types of asphalt concrete, as designated in the Engineer's Estimate.

The mass of the materials will be determined in conformance with the provisions in Section 9-1.01, "Measurement of Quantities," of the Standard Specifications.

Quantities of paving asphalt, liquid asphalt, and asphaltic emulsion to be paid for as contract items of work will be determined in conformance with the methods provided in Section 92, "Asphalts," Section 93, "Liquid Asphalts," or Section 94, "Asphaltic Emulsions," of the Standard Specifications, as the case may be.

When recorded batch masses are printed automatically, these masses may be used for determining pay quantities provided the following requirements are complied with:

A. Total aggregate and supplemental fine aggregate mass per batch shall be printed. When supplemental fine aggregate is weighed cumulatively with the aggregate, the total batch mass of aggregate shall include the supplemental fine aggregate.
B. The total bitumen mass per batch shall be printed.
C. Zero-tolerance mass shall be printed prior to weighing the first batch and after weighing the last batch of each truckload.
D. The time, date, mix number, load number, and truck identification shall be correlated with the load slip.
E. A copy of the recorded batch masses shall be certified by a licensed weighmaster and submitted to the Engineer.

Pavement reinforcing fabric will be measured and paid for by the square meter for the actual pavement area covered.

39-12.02 PAYMENT

Asphalt concrete placed in the work, unless otherwise specified, will be paid for at the contract price per tonne for asphalt concrete of the types designated in the Engineer's Estimate.

Compensation adjustment for asphalt concrete will be in conformance with Section 39-11.02C, "Pay Factor Determination and Compensation Adjustment," of this Section 11-1, "Quality Control / Quality Assurance."

When there is a contract item for asphalt concrete (leveling), quantities of asphalt concrete placed for leveling will be paid for at the contract price per tonne for asphalt concrete (leveling). When there is no contract item for asphalt concrete (leveling), and leveling is ordered by the Engineer, asphalt concrete so used will be paid for as extra work as provided in Section 4-1.03D of the Standard Specifications.

For asphalt concrete placed in dig outs, as a leveling course, for slope correction, for detours not included in the finished roadway prism, in areas where in the judgment of the Engineer compaction or compaction measurement by conventional methods is impeded or on the uppermost lift of shoulders with rumble strips the relative compaction provisions of Section 39-11.02, "Statistical Evaluation and Determination of Pay Factor," of this Section 11-1, shall not apply. In the computation of the composite pay factor (PF_C) for the lot composed of this asphalt concrete, an individual pay factor of 1.0 for the relative compaction (PF_{QC8}) shall be used.

Full compensation for the Contractor's Quality Control Plan, including furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in developing, implementing, modifying, and fulfilling the requirements of the Quality Control Plan shall be considered as included in the contract price paid per tonne for asphalt concrete of the types designated in the Engineer's Estimate and no additional compensation will be allowed therefor.

Full compensation for Contractor sampling, testing, inspection, testing facilities, and preparation and submission of results shall be considered as included in the contract price paid per tonne for asphalt concrete of the types designated in the Engineer's Estimate and no additional compensation will be allowed therefor.

Quantities of pavement reinforcing fabric placed and paving asphalt applied as a binder for the pavement reinforcing fabric will be paid for at the contract price per square meter for pavement reinforcing fabric and per tonne for paving asphalt (binder-pavement reinforcing fabric). Full compensation for furnishing and spreading sand to cover exposed binder material, if necessary, shall be considered as included in the contract price paid per tonne for paving asphalt (binder-pavement reinforcing fabric) and no separate payment will be made therefor.

Small quantities of asphalt concrete placed on pavement reinforcing fabric to prevent the fabric from being displaced by construction equipment or to allow public traffic to cross over the fabric shall be considered as part of the layer of asphalt concrete to be placed over the fabric and will be measured and paid for by the tonne as asphalt concrete of the types designated in the Engineer's Estimate.

When there is a contract item for liquid asphalt (prime coat), the quantity of prime coat will be paid for at the contract price per tonne for the designated grade of liquid asphalt (prime coat). When there is no contract item for liquid asphalt (prime coat) and the special provisions require the application of a prime coat, full compensation for furnishing and applying the prime coat shall be considered as included in the contract price paid per tonne for asphalt concrete of the types designated in the Engineer's Estimate and no separate payment will be made therefor.

When there is a contract item for asphaltic emulsion (paint binder), the quantity of asphaltic emulsion or paving asphalt used as paint binder (tack coat) will be paid for at the contract price per tonne for asphaltic emulsion (paint binder). When there is no contract item for asphaltic emulsion (paint binder), full compensation for furnishing and applying paint binder (tack coat) shall be considered as included in the contract price paid per tonne for asphalt concrete of the types designated in the Engineer's Estimate and no separate payment will be made therefor.

Fog seal coat will be paid for as provided in Section 37-1, "Seal Coats," of the Standard Specifications.

No adjustment of compensation will be made for an increase or decrease in the quantities of paint binder (tack coat) or fog seal coat required, regardless of the reason for such increase or decrease. The provisions in Section 4-1.03B, "Increased or Decreased Quantities," of the Standard Specifications shall not apply to the items of paint binder or fog seal coat.

The above contract prices and payments shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in placing asphalt concrete, complete in place, as shown on the plans, as specified in this Section 11-1, "Quality Control / Quality Assurance," and "Asphalt Concrete" in Section 10-1, "General," of these special provisions, and as directed by the Engineer.

SECTION 12. (BLANK)

SECTION 13. RELATIONS WITH RAILROAD

13-1.01 GENERAL

The contractor's attention is directed to the tracks and right of way of Amador Central Railroad Co. hereinafter referred to as "Railroad," at State Route 49, between PM 6.0 / 6.9, near Martell in Amador County, south of the limits of this project encompassing State Route 49 PM 7.0 / R11.0.

In accordance with the provisions in Section 7-1.12, "Responsibility for Damage," of the Standard Specifications, the Contractor shall be responsible for all damages to railroad tracks and appurtenances thereto and to railroad equipment operating on such track, resulting from his operations.

The Contractor shall not allow any personnel or equipment on the Railroad right of way.

The Contractor shall conduct his operation in a manner that shall have no impact on the tracks and right of way of the Railroad.

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 _____, 20 __, 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 _____, 20 __, 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 that the applicable wage rate and fringe benefits or cash equivalent for the classification of worked 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 that $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	6.8
	CA Lassen; CA Modoc;CA Plumas;CA Shasta; CA Siskiyou; CA Tehama.	
175	**Eureka, CA**	
	Non-SMSA Counties	6.6
	CA Del Norte; CA Humboldt; CA Trinity.	
176	**San Francisco-Oakland-San Jose, CA:**	
	SMSA Counties:	
	7120 Salinas-Seaside-Monterey, CA	28.9
	CA Monterey.	
	7360 San Francisco-Oakland	25.6
	CA Alameda; CA Contra Costa; CA Marin; CA San Francisco; CA San Mateo.	
	7400 San Jose, CA	19.6
	CA Santa Clara.	
	7485 Santa Cruz, CA.	14.9
	CA Santa Cruz.	
	7500 Santa Rosa, CA	9.1
	CA Sonoma.	
	8720 Vallejo-Fairfield- Napa, CA	17.1
	CA Napa; CA Solano	
	Non-SMSA Counties	23.2
	CA Lake; CA Mendocino; CA San Benito	
177	**Sacramento, CA**:	
	SMSA Counties:	
	6920 Sacramento, CA	16.1
	CA Placer; CA Sacramento; CA Yolo.	
	Non-SMSA Counties	14.3
	CA Butte; CA Colusa; CA El Dorado; CA Glenn; CA Nevada; CA Sierra; CA Sutter; CA Yuba.	
178	**Stockton-Modesto, CA:**	
	SMSA Counties:	
	5170 Modesto, CA	12.3
	CA Stanislaus.	
	8120 Stockton, CA	24.3
	CA San Joaquin.	
	Non-SMSA Counties	19.8
	CA Alpine; CA Amador; CA Calaveras; CA Mariposa;CA Merced; CA Tuolumne.	

		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 12.

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.