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STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

**NOTICE TO CONTRACTORS
AND
SPECIAL PROVISIONS**

**FOR CONSTRUCTION ON STATE HIGHWAY IN
GLENN COUNTY IN AND NEAR WILLOWS FROM THE COLUSA COUNTY LINE TO 0.2 MILES NORTH OF
COUNTY ROAD 28.**

DISTRICT 03, ROUTE 5

**For Use in Connection with Standard Specifications Dated MAY 2006, Standard Plans Dated MAY 2006, and Labor
Surcharge and Equipment Rental Rates.**

**CONTRACT NO. 03-1E6904
03-Gle-5-R0.0/R20.0**

**Bids Open: April 24, 2007
Dated: March 26, 2007**

AADD

IMPORTANT SPECIAL NOTICES

- Attention is directed to Section 3, "Award and Execution of Contract," of these special provisions regarding submittal of the documents identified in Section 3-1.025, "Insurance Policies," of the Standard Specifications.

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STANDARD PLANS LIST

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

A10A	Acronyms and Abbreviations (Sheet 1 of 2)
A10B	Acronyms and Abbreviations (Sheet 2 of 2)
A10C	Symbols (Sheet 1 of 2)
A10D	Symbols (Sheet 2 of 2)
A20A	Pavement Markers and Traffic Lines, Typical Details
A20B	Pavement Markers and Traffic Lines, Typical Details
A20C	Pavement Markers and Traffic Lines, Typical Details
A20D	Pavement Markers and Traffic Lines, Typical Details
A24A	Pavement Markings – Arrows
A24B	Pavement Markings – Arrows
A24D	Pavement Markings – Words
A24E	Pavement Markings – Words and Crosswalks
A40B	Shoulder Rumble Strip Details – Ground-In Indentations
A73A	Object Markers
A73B	Markers
A77F1	Metal Beam Guard Railing – Typical Layouts for Structure Approach
A77J1	Metal Beam Guard Railing – Connections to Bridge Railings without Sidewalks Details No. 1
A77J4	Metal Beam Guard Railing – Transition Railing (Type WB)
A77L1	Metal Beam Railing – Terminal System (Type SRT)
A87B	Asphalt Concrete Dikes
D87D	Overside Drains
T2	Temporary Crash Cushion, Sand Filled (Shoulder Installations)
T3	Temporary Railing (Type K)
RSP T7	Construction Project Funding Identification Signs
T10	Traffic Control System for Lane Closure On Freeways and Expressways
T10A	Traffic Control System for Lane and Complete Closures on Freeways and Expressways
T14	Traffic Control System for Ramp Closure
T15	Traffic Control System for Moving Lane Closure on Multilane Highways
T16	Traffic Control System for Moving Lane Closure on Multilane Highways
T56	Temporary Water Pollution Control Details (Temporary Fiber Roll)
RS1	Roadside Signs, Typical Installation Details No. 1

RS2	Roadside Signs – Wood Post, Typical Installation Details No. 2
S93	Framing Details for Framed Single Sheet Aluminum Signs, Rectangular Shape
S94	Roadside Framed Single Sheet Aluminum Signs, Rectangular Shape
ES-1A	Electrical Systems (Symbols and Abbreviations)
ES-1B	Electrical Systems (Symbols and Abbreviations)
ES-1C	Electrical Systems (Symbols and Abbreviations)
ES-5A	Electrical Systems (Detectors)
ES-5B	Electrical Systems (Detectors)
ES-5D	Electrical Systems (Detectors)
ES-13B	Electrical Systems (Wiring Details and Fuse Ratings)

DEPARTMENT OF TRANSPORTATION

NOTICE TO CONTRACTORS

CONTRACT NO. 03-1E6904

03-Gle-5-R0.0/R20.0

Sealed proposals for the work shown on the plans entitled:

STATE OF CALIFORNIA; DEPARTMENT OF TRANSPORTATION; PROJECT PLANS FOR CONSTRUCTION ON STATE HIGHWAY IN GLENN COUNTY IN AND NEAR WILLOWS FROM THE COLUSA COUNTY LINE TO 0.2 MILES NORTH OF COUNTY ROAD 28.

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 April 24, 2007, 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 GLENN COUNTY IN AND NEAR WILLOWS FROM THE COLUSA COUNTY LINE TO 0.2 MILES NORTH OF COUNTY ROAD 28.

General work description: Place Rubberized Asphalt Concrete Overlay and Rumble Strips

This project has a goal of 3 percent disabled veteran business enterprise (DVBE) participation.

No prebid meeting is scheduled for this project.

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 one of the following Class C licenses: C-12.

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

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

This project is subject to the State Small Business Preference, Non-Small Business Subcontractor Preference, and California Company Reciprocal Preference.

The District in which the work for this project is located has been incorporated into the Department's Northern Region. References in the Instruction to Bidders or the General Conditions or in the special provisions to the district shall be deemed to mean the Northern Region. The office of the District Director for the Northern Region is located at Marysville.

Inquiries or questions based on alleged patent ambiguity of the plans, specifications or estimate must be communicated as a bidder inquiry prior to bid opening. Any such inquiries or questions, submitted after bid opening, will not be treated as a bid protest.

The Department will consider bidder inquiries only when made in writing and shall be submitted to CALTRANS North Region Construction Office by either E-mail or Fax:

E-mail: inquiry_nr_bid@dot.ca.gov

FAX Number: (530) 822-4324

Contract No. 03-1E6904

Responses to the bidder will be posted on the Internet at:

www.dot.ca.gov/dist3/departments/construction/bidders/find_res.htm

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.

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

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

DEPARTMENT OF TRANSPORTATION

Deputy Director Transportation Engineering

Dated March 26, 2007

D03JAM

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

03-1E6904

Item No.	Item Code	Item Description	Unit of Measure	Estimated Quantity
1	070012	PROGRESS SCHEDULE (CRITICAL PATH METHOD)	LS	LUMP SUM
2	070018	TIME-RELATED OVERHEAD	WDAY	105
3	074016	CONSTRUCTION SITE MANAGEMENT	LS	LUMP SUM
4	074019	PREPARE STORM WATER POLLUTION PREVENTION PLAN	LS	LUMP SUM
5 (S)	120090	CONSTRUCTION AREA SIGNS	LS	LUMP SUM
6 (S)	120100	TRAFFIC CONTROL SYSTEM	LS	LUMP SUM
7 (S)	128650	PORTABLE CHANGEABLE MESSAGE SIGN	LS	LUMP SUM
8 (S)	150704	REMOVE YELLOW THERMOPLASTIC TRAFFIC STRIPE	LF	2290
9 (S)	150714	REMOVE THERMOPLASTIC TRAFFIC STRIPE	LF	2290
10 (S)	150722	REMOVE PAVEMENT MARKER	EA	54 200
11 (S)	153103	COLD PLANE ASPHALT CONCRETE PAVEMENT	SQYD	667 000
12	190110	LEAD COMPLIANCE PLAN	LS	LUMP SUM
13	198007	IMPORTED MATERIAL (SHOULDER BACKING)	TON	8
14 (S)	203021	FIBER ROLLS	LF	900
15	374002	ASPHALTIC EMULSION (FOG SEAL COAT)	TON	73
16	374206	SEAL RANDOM CRACKS	LNMI	84
17	390102	ASPHALT CONCRETE (TYPE A)	TON	570
18	390127	RUBBERIZED ASPHALT CONCRETE (TYPE O)	TON	35 000
19	394054	SHOULDER RUMBLE STRIP (AC, GROUND-IN INDENTATIONS)	STA	193
20	820151	OBJECT MARKER (TYPE L-1)	EA	1

Item No.	Item Code	Item Description	Unit of Measure	Estimated Quantity
21	839541	TRANSITION RAILING (TYPE WB)	EA	1
22	839585	ALTERNATIVE FLARED TERMINAL SYSTEM	EA	1
23 (S)	840504	4" THERMOPLASTIC TRAFFIC STRIPE	LF	466 000
24 (S)	840506	8" THERMOPLASTIC TRAFFIC STRIPE	LF	11 200
25 (S)	840515	THERMOPLASTIC PAVEMENT MARKING	SQFT	2980
26 (S)	840525	4" THERMOPLASTIC TRAFFIC STRIPE (BROKEN 36-12)	LF	212 000
27 (S)	840526	4" THERMOPLASTIC TRAFFIC STRIPE (BROKEN 17-7)	LF	3900
28 (S)	850101	PAVEMENT MARKER (NON-REFLECTIVE)	EA	130
29 (S)	850111	PAVEMENT MARKER (RETROREFLECTIVE)	EA	10 300
30 (S)	860810	INDUCTIVE LOOP DETECTOR	LS	LUMP SUM
31	999990	MOBILIZATION	LS	LUMP SUM

**STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION**

SPECIAL PROVISIONS

Annexed to Contract No. 03-1E6904

SECTION 1. SPECIFICATIONS AND PLANS

The work embraced herein shall conform to the provisions in the Standard Specifications dated May 2006, and the Standard Plans dated May 2006, 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 MAY 2006 STANDARD SPECIFICATIONS

UPDATED FEBRUARY 16, 2007

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 1: DEFINITIONS AND TERMS

Issue Date: January 19, 2007

Section 1-1.01, "General," of the Standard Specifications is amended by adding the following:

- The Department is gradually changing the style and language of the specifications. The new style and language includes:

1. Use of:

- 1.1. Imperative mood
- 1.2. Introductory modifiers
- 1.3. Conditional clauses

2. Elimination of:

- 2.1. Language variations
- 2.2. Definitions for industry-standard terms
- 2.3. Redundant specifications
- 2.4. Needless cross-references

- The use of this new style does not change the meaning of a specification not yet using this style.

- The specifications are written to the Bidder before award and the Contractor after. Before award, interpret sentences written in the imperative mood as starting with "The Bidder must" and interpret "you" as "the Bidder" and "your" as "the Bidder's." After award, interpret sentences written in the imperative mood as starting with "The Contractor must" and interpret "you" as "the Contractor" and "your" as "the Contractor's."
- Unless an object or activity is specified to be less than the total, the quantity or amount is all of the object or activity.
- All items in a list apply unless the items are specified as choices.
- Interpret terms as defined in the Contract documents. A term not defined in the Contract documents has the meaning defined in Means Illustrated Construction Dictionary, Condensed Version, Second Edition.

Section 1, "Definitions and Terms," of the Standard Specifications is amended by adding the following sections:

1-1.082 BUSINESS DAY

- Day on the calendar except Saturday or holiday.

1-1.084 CALIFORNIA MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES

- The California Manual on Uniform Traffic Control Devices for Streets and Highways (California MUTCD) is issued by the Department of Transportation and is the Federal Highway Administration's MUTCD 2003 Edition, as amended for use in California.

1-1.245 HOLIDAY

- Day designated as a State holiday under Govt Code § 6700 et seq. except September 9th, "Admission Day." The day after Thanksgiving Day is a non-working day. Interpret "legal holiday" as "holiday."

Section 1-1.255, "Legal Holidays," of the Standard Specifications is deleted.

Section 1-1.265, "Manual on Uniform Traffic Control Devices," of the Standard Specifications is deleted.

Section 1-1.266, "Manual on Uniform Traffic Control Devices California Supplement," of the Standard Specifications is deleted.

Section 1-1.39 "State," of the Standard Specifications is amended to read:

1-1.39 STATE

- The State of California, including its agencies, departments, or divisions, whose conduct or action is related to the work.

SECTION 3: AWARD AND EXECUTION OF CONTRACT

Issue Date: December 11, 2006

Section 3-1.025, "Insurance Policies," of the Standard Specifications is amended to read:

3-1.025 INSURANCE POLICIES

- The successful bidder shall submit:
 1. Copy of its commercial general liability policy and its excess policy or binder until such time as a policy is available, including the declarations page, applicable endorsements, riders, and other modifications in effect at the time of contract execution. Standard ISO form No. CG 0001 or similar exclusions are allowed if not inconsistent with Section 7-1.12, "Indemnification and Insurance." Allowance of additional exclusions is at the discretion of the Department.
 2. Certificate of insurance showing all other required coverages. Certificates of insurance, as evidence of required insurance for the auto liability and any other required policy, shall set forth deductible amounts applicable to each policy and all exclusions that are added by endorsement to each policy. The evidence of insurance shall provide that no cancellation, lapse, or reduction of coverage will occur without 10 days prior written notice to the Department.

3. A declaration under the penalty of perjury by a certified public accountant certifying the accountant has applied Generally Accepted Accounting Principles (GAAP) guidelines confirming the successful bidder has sufficient funds and resources to cover any self-insured retentions if the self-insured retention is \$50,000 or higher.

- If the successful bidder uses any form of self-insurance for workers compensation in lieu of an insurance policy, it shall submit a certificate of consent to self-insure in accordance with the provisions of Section 3700 of the Labor Code.

Section 3-1.03, "Execution of Contract," of the Standard Specifications is amended to read:

3-1.03 EXECUTION OF CONTRACT

- The contract shall be signed by the successful bidder and returned, together with the contract bonds and the documents identified in Section 3-1.025, "Insurance Policies," within 10 business days of receiving the contract for execution.

Section 3-1.04, "Failure to Execute Contract," of the Standard Specifications is amended to read:

3-1.04 FAILURE TO EXECUTE CONTRACT

- Failure of the lowest responsible bidder, the second lowest responsible bidder, or the third lowest responsible bidder to execute the contract as required in Section 3-1.03, " Execution of Contract," within 10 business days of receiving the contract for execution shall be just cause for the forfeiture of the proposal guaranty. The successful bidder may file with the Department a written notice, signed by the bidder or the bidder's authorized representative, specifying that the bidder will refuse to execute the contract if it is presented. The filing of this notice shall have the same force and effect as the failure of the bidder to execute the contract and furnish acceptable bonds within the time specified.

SECTION 7: LEGAL RELATIONS AND RESPONSIBILITIES

Issue Date: February 16, 2006

Section 7-1.01A(6), "Workers' Compensation," of the Standard Specifications is amended to read:

7-1.101A(6) (Blank)

The first sentence of the eighth paragraph of Section 7-1.09, "Public Safety," of the Standard Specifications is amended to read:

- Signs, lights, flags, and other warning and safety devices and their use shall conform to the requirements set forth in Part 6 of the California MUTCD.

The sixteenth paragraph of Section 7-1.09, "Public Safety," of the Standard Specifications is amended to read:

- When vertical clearance is temporarily reduced to 15.5 feet or less, low clearance warning signs shall be placed in accordance with Part 2 of the California MUTCD and as directed by the Engineer. Signs shall conform to the dimensions, color, and legend requirements of the California MUTCD and these specifications except that the signs shall have black letters and numbers on an orange retroreflective background. W12-2P signs shall be illuminated so that the signs are clearly visible.

Section 7-1.12, "Indemnification and Insurance," of the Standard Specifications is amended to read:

7-1.12 INDEMNIFICATION AND INSURANCE

- The Contractor's obligations regarding indemnification of the State of California and the requirements for insurance shall conform to the provisions in Section 3-1.025, "Insurance Policies," and Sections 7-1.12A, "Indemnification," and 7-1.12B, "Insurance," of this Section 7-1.12.

7-1.12A Indemnification

- The Contractor shall defend, indemnify, and save harmless the State, including its officers, employees, and agents (excluding agents who are design professionals) from any and all claims, demands, causes of action, damages, costs,

expenses, actual attorneys' fees, losses or liabilities, in law or in equity (Section 7-1.12A Claims) arising out of or in connection with the Contractor's performance of this contract for:

1. Bodily injury including, but not limited to, bodily injury, sickness or disease, emotional injury or death to persons, including, but not limited to, the public, any employees or agents of the Contractor, the State, or any other contractor; and
2. Damage to property of anyone including loss of use thereof; caused or alleged to be caused in whole or in part by any negligent or otherwise legally actionable act or omission of the Contractor or anyone directly or indirectly employed by the Contractor or anyone for whose acts the Contractor may be liable.

- Except as otherwise provided by law, these requirements apply regardless of the existence or degree of fault of the State. The Contractor is not obligated to indemnify the State for Claims arising from conduct delineated in Civil Code Section 2782 and to Claims arising from any defective or substandard condition of the highway that existed at or before the start of work, unless this condition has been changed by the work or the scope of the work requires the Contractor to maintain existing highway facilities and the Claim arises from the Contractor's failure to maintain. The Contractor's defense and indemnity obligation shall extend to Claims arising after the work is completed and accepted if the Claims are directly related to alleged acts or omissions by the Contractor that occurred during the course of the work. State inspection is not a waiver of full compliance with these requirements.

- The Contractor's obligation to defend and indemnify shall not be excused because of the Contractor's inability to evaluate liability or because the Contractor evaluates liability and determine that the Contractor is not liable. The Contractor shall respond within 30 days to the tender of any Claim for defense and indemnity by the State, unless this time has been extended by the State. If the Contractor fails to accept or reject a tender of defense and indemnity within 30 days, in addition to any other remedy authorized by law, the Department may withhold such funds the State reasonably considers necessary for its defense and indemnity until disposition has been made of the Claim or until the Contractor accepts or rejects the tender of defense, whichever occurs first.

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

- Nothing in the Contract is intended to establish a standard of care owed to any member of the public or to extend to the public the status of a third-party beneficiary for any of these indemnification specifications.

7-1.12B Insurance

7-1.12B(1) General

- Nothing in the contract is intended to establish a standard of care owed to any member of the public or to extend to the public the status of a third-party beneficiary for any of these insurance specifications.

7-1.12B(2) Casualty Insurance

- The Contractor shall procure and maintain insurance on all of its operations with companies acceptable to the State as follows:

1. The Contractor shall keep all insurance in full force and effect from the beginning of the work through contract acceptance.
2. All insurance shall be with an insurance company with a rating from A.M. Best Financial Strength Rating of A- or better and a Financial Size Category of VII or better.
3. The Contractor shall maintain completed operations coverage with a carrier acceptable to the State through the expiration of the patent deficiency in construction statute of repose set forth in Code of Civil Procedure Section 337.1.

7-1.12B(3) Workers' Compensation and Employer's Liability Insurance

- In accordance with Labor Code Section 1860, the Contractor shall secure the payment of worker's compensation in accordance with Labor Code Section 3700.

- In accordance with Labor Code Section 1861, the Contractor shall submit to the Department the following certification before performing the work:

I am aware of the provisions of Section 3700 of the Labor Code which require every employer to be insured against liability for workers' compensation or to undertake self-insurance in accordance with the provisions of that code, and I will comply with such provisions before commencing the performance of the work of this contract.

- Contract execution constitutes certification submittal.

- The Contractor shall provide Employer's Liability Insurance in amounts not less than:
 1. \$1,000,000 for each accident for bodily injury by accident
 2. \$1,000,000 policy limit for bodily injury by disease
 3. \$1,000,000 for each employee for bodily injury by disease

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

7-1.12B(4) Liability Insurance

7-1.12B(4)(a) General

- The Contractor shall carry General Liability and Umbrella or Excess Liability Insurance covering all operations by or on behalf of the Contractor providing insurance for bodily injury liability and property damage liability for the following limits and including coverage for:

1. Premises, operations, and mobile equipment
2. Products and completed operations
3. Broad form property damage (including completed operations)
4. Explosion, collapse, and underground hazards
5. Personal injury
6. Contractual liability

7-1.12B(4)(b) Liability Limits/Additional Insureds

- The limits of liability shall be at least the amounts shown in the following table:

Total Bid	For Each Occurrence ¹	Aggregate for Products/Completed Operation	General Aggregate ²	Umbrella or Excess Liability ³
≤\$1,000,000	\$1,000,000	\$2,000,000	\$2,000,000	\$5,000,000
>\$1,000,000 ≤\$5,000,000	\$1,000,000	\$2,000,000	\$2,000,000	\$10,000,000
>\$5,000,000 ≤\$25,000,000	\$2,000,000	\$2,000,000	\$4,000,000	\$15,000,000
>\$25,000,000	\$2,000,000	\$2,000,000	\$4,000,000	\$25,000,000
1. Combined single limit for bodily injury and property damage. 2. This limit shall apply separately to the Contractor's work under this contract. 3. The umbrella or excess policy shall contain a clause stating that it takes effect (drops down) in the event the primary limits are impaired or exhausted.				

- The Contractor shall not require certified Small Business subcontractors to carry Liability Insurance that exceeds the limits in the table above. Notwithstanding the limits specified herein, at the option of the Contractor, the liability insurance limits for certified Small Business subcontractors of any tier may be less than those limits specified in the table. For Small Business subcontracts, "Total Bid" shall be interpreted as the amount of subcontracted work to a certified Small Business.

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

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

- Additional insured coverage shall be provided by a policy provision or by an endorsement providing coverage at least as broad as Additional Insured (Form B) endorsement form CG 2010, as published by the Insurance Services Office (ISO), or other form designated by the Department.

7-1.12B(4)(c) Contractor's Insurance Policy is Primary

- The policy shall stipulate that the insurance afforded the additional insureds applies as primary insurance. Any other insurance or self-insurance maintained by the State is excess only and shall not be called upon to contribute with this insurance.

7-1.12B(5) Automobile Liability Insurance

- The Contractor shall carry automobile liability insurance, including coverage for all owned, hired, and nonowned automobiles. The primary limits of liability shall be not less than \$1,000,000 combined single limit each accident for bodily injury and property damage. The umbrella or excess liability coverage required under Section 7-1.12B(4)(b) also applies to automobile liability.

7-1.12B(6) Policy Forms, Endorsements, and Certificates

- The Contractor shall provide its General Liability Insurance under Commercial General Liability policy form No. CG0001 as published by the Insurance Services Office (ISO) or under a policy form at least as broad as policy form No. CG0001.

7-1.12B(7) Deductibles

- The State may expressly allow deductible clauses, which it does not consider excessive, overly broad, or harmful to the interests of the State. Regardless of the allowance of exclusions or deductions by the State, the Contractor is responsible for any deductible amount and shall warrant that the coverage provided to the State is in accordance with Section 7-1.12B, "Insurance."

7-1.12B(8) Enforcement

- The Department may assure the Contractor's compliance with its insurance obligations. Ten days before an insurance policy lapses or is canceled during the contract period, the Contractor shall submit to the Department evidence of renewal or replacement of the policy.

- If the Contractor fails to maintain any required insurance coverage, the Department may maintain this coverage and withhold or charge the expense to the Contractor or terminate the Contractor's control of the work in accordance with Section 8-1.08, "Termination of Control."

- The Contractor is not relieved of its duties and responsibilities to indemnify, defend, and hold harmless the State, its officers, agents, and employees by the Department's acceptance of insurance policies and certificates.

- Minimum insurance coverage amounts do not relieve the Contractor for liability in excess of such coverage, nor do they preclude the State from taking other actions available to it, including the withholding of funds under this contract.

7-1.12B(9) Self-Insurance

- Self-insurance programs and self-insured retentions in insurance policies are subject to separate annual review and approval by the State.

- If the Contractor uses a self-insurance program or self-insured retention, the Contractor shall provide the State with the same protection from liability and defense of suits as would be afforded by first-dollar insurance. Execution of the contract is the Contractor's acknowledgement that the Contractor will be bound by all laws as if the Contractor were an insurer as defined under Insurance Code Section 23 and that the self-insurance program or self-insured retention shall operate as insurance as defined under Insurance Code Section 22.

SECTION 12: CONSTRUCTION AREA TRAFFIC CONTROL DEVICES

Issue Date: October 6, 2006

The first sentence of the second paragraph of Section 12-1.01, "Description," of the Standard Specifications is amended to read:

- Attention is directed to Part 6 of the California MUTCD.

Section 12-2.01, "Flaggers," of the Standard Specifications is amended to read:

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12-2.01 FLAGGERS

- Flaggers while on duty and assigned to traffic control or to give warning to the public that the highway is under construction and of any dangerous conditions to be encountered as a result thereof, shall perform their duties and shall be provided with the necessary equipment in conformance with Part 6 of the California MUTCD. The equipment shall be furnished and kept clean and in good repair by the Contractor at the Contractor's expense.

The first paragraph of Section 12-3.01, "General," of the Standard Specifications is amended to read:

- In addition to the requirements in Part 6 of the California MUTCD, all devices used by the Contractor in the performance of the work shall conform to the provisions in this Section 12-3.

The second sentence of the first paragraph of Section 12-3.06, "Construction Area Signs," of the Standard Specifications is amended to read:

- Construction area signs are shown in or referred to in Part 6 of the California MUTCD.

The first sentence of the fourth paragraph of Section 12-3.06, "Construction Area Signs," of the Standard Specifications is amended to read:

- All construction area signs shall conform to the dimensions, color and legend requirements of the plans, Part 6 of the California MUTCD and these specifications.

The first sentence of the eighth paragraph of Section 12-3.06, "Construction Area Signs," of the Standard Specifications is amended to read:

- Used signs with the specified sheeting material will be considered satisfactory if they conform to the requirements for visibility and legibility and the colors conform to the requirements in Part 6 of the California MUTCD.

SECTION 19: EARTHWORK

Issue Date: January 5, 2007

The first paragraph of Section 19-3.025C, "Soil Cement Bedding," of the Standard Specifications is amended to read:

- Cementitious material used in soil cement bedding shall conform to the provisions in Section 90-2.01, "Cementitious Materials." Supplementary cementitious material will not be required.

The fourth paragraph of Section 19-3.025C, "Soil Cement Bedding," of the Standard Specifications is amended to read:

- The aggregate, cementitious material, and water shall be proportioned either by weight or by volume. Soil cement bedding shall contain not less than 282 pounds of cementitious material per cubic yard. The water content shall be sufficient to produce a fluid, workable mix that will flow and can be pumped without segregation of the aggregate while being placed.

The first paragraph of Section 19-3.062, "Slurry Cement Backfill," of the Standard Specifications is amended to read:

- Slurry cement backfill shall consist of a fluid, workable mixture of aggregate, cementitious material, and water.

The fifth paragraph of Section 19-3.062, "Slurry Cement Backfill," of the Standard Specifications is amended to read:

- Cementitious material shall conform to the provisions in Section 90-2.01, "Cementitious Materials." Supplementary cementitious material will not be required.

The eighth paragraph of Section 19-3.062, "Slurry Cement Backfill," of the Standard Specifications is amended to read:

- The aggregate, cementitious material, and water shall be proportioned either by weight or by volume. Slurry cement backfill shall contain not less than 188 pounds of cementitious material per cubic yard. The water content shall be sufficient to produce a fluid, workable mix that will flow and can be pumped without segregation of the aggregate while being placed.

SECTION 20: EROSION CONTROL AND HIGHWAY PLANTING

Issue Date: January 19, 2007

The last 3 paragraphs of Section 20-2.10, "Seed," of the Standard Specifications are deleted.

The last paragraph of Section 20-3.04A, "General," of the Standard Specifications is deleted.

SECTION 25: AGGREGATE SUBBASES

Issue Date: February 16, 2007

The first paragraph of Section 25-1.02A, "Class 1, Class 2, and Class 3 Aggregate Subbases," of the Standard Specifications is amended to read:

- Aggregate must be clean and free from organic matter and other deleterious substances. Aggregate must consist of any combination of:

1. Broken stone
2. Crushed gravel
3. Natural rough surfaced gravel
4. Sand
5. Up to 100 percent of any combination of processed:
 - 5.1. Asphalt concrete
 - 5.2. Portland cement concrete
 - 5.3. Lean concrete base
 - 5.4. Cement treated base

The first paragraph of Section 25-1.02B, "Class 4 Aggregate Subbase," of the Standard Specifications is amended to read:

- Aggregate must be clean and free from organic matter and other deleterious substances. Aggregate must consist of any combination of:

1. Broken stone
2. Crushed gravel
3. Natural rough surfaced gravel
4. Sand
5. Up to 100 percent of any combination of processed:
 - 5.1. Asphalt concrete
 - 5.2. Portland cement concrete
 - 5.3. Lean concrete base
 - 5.4. Cement treated base

SECTION 26: AGGREGATE BASE

Issue Date: February 16, 2007

The first paragraph of Section 26-1.02A, "Class 2 Aggregate Base," of the Standard Specifications is amended to read:

- Aggregate must be clean and free from organic matter and other deleterious substances. Aggregate must consist of any combination of:

1. Broken stone
2. Crushed gravel

3. Natural rough surfaced gravel
4. Sand
5. Up to 100 percent of any combination of processed:
 - 5.1. Asphalt concrete
 - 5.2. Portland cement concrete
 - 5.3. Lean concrete base
 - 5.4. Cement treated base

The first paragraph of Section 26-1.02B, "Class 3 Aggregate Base," of the Standard Specifications is amended to read:

- Aggregate must be clean and free from organic matter and other deleterious substances. Aggregate must consist of any combination of:

1. Broken stone
2. Crushed gravel
3. Natural rough surfaced gravel
4. Sand
5. Up to 100 percent of any combination of processed:
 - 5.1. Asphalt concrete
 - 5.2. Portland cement concrete
 - 5.3. Lean concrete base
 - 5.4. Cement treated base

SECTION 27: CEMENT TREATED BASES

Issue Date: January 5, 2007

The first paragraph of Section 27-1.02, "Materials," of the Standard Specifications is amended to read:

- Cement shall be Type II portland cement conforming to the provisions in Section 90-2.01A, "Cement."

The third paragraph of Section 27-1.02, "Materials," of the Standard Specifications is amended to read:

- Aggregate for use in Class A cement treated base shall be of such quality that when mixed with cement in an amount not to exceed 5 percent by weight of the dry aggregate and compacted at optimum moisture content, the compressive strength of a sample of the compacted mixture shall not be less than 750 pounds per square inch at 7 days, when tested by California Test 312.

The fourth paragraph of Section 27-1.02, "Materials," of the Standard Specifications is amended to read:

- Aggregate for use in Class B cement treated base shall have a Resistance (R-value) of not less than 60 before mixing with cement and a Resistance (R-value) of not less than 80 after mixing with cement in an amount not to exceed 2.5 percent by weight of the dry aggregate.

SECTION 28: LEAN CONCRETE BASE

Issue Date: January 5, 2007

The first paragraph of Section 28-1.02, "Materials," of the Standard Specifications is amended to read:

- Cement shall be Type II portland cement conforming to the provisions in Section 90-2.01A, "Cement."

The sixth paragraph of Section 28-1.02, "Materials," of the Standard Specifications is amended to read:

- Aggregate shall be of such quality that, when mixed with cement in an amount not to exceed 300 pounds per cubic yard, and tested in conformance with the requirements in California Test 548, the compressive strength of a sample will be not less than 700 pounds per square inch at 7 days.

SECTION 29: TREATED PERMEABLE BASES

Issue Date: January 5, 2007

The second paragraph of Section 29-1.02B, "Cement Treated Permeable Base," of the Standard Specifications is amended to read:

- Cement shall be Type II portland cement conforming to the provisions in Section 90-2.01A, "Cement."

The second paragraph of Section 29-1.04B, "Cement Treated Permeable Base," of the Standard Specifications is amended to read:

- Cement treated permeable base shall contain not less than 287 pounds of cement per cubic yard.

SECTION 40: PORTLAND CEMENT CONCRETE PAVEMENT

Issue Date: January 5, 2007

Section 40-1.015, "Cement Content," is deleted.

Section 40-1.05, "Proportioning," of the Standard Specifications is amended to read:

- Aggregate and cementitious material proportioning shall conform to the provisions in Section 90-5, "Proportioning."

The first paragraph in Section 40-1.105, "Exit Ramp Termini," of the Standard Specifications is amended to read:

- Concrete pavement shall be constructed at the ends of exit ramps when required by the plans or the special provisions. Texturing for exit ramp termini shall be by means of heavy brooming in a direction normal to ramp centerline. The hardened surface shall have a coefficient of friction not less than 0.35 as determined by California Test 342. Minimum cementitious material content of concrete in pavement for exit ramp termini shall be 590 pounds per cubic yard.

The first paragraph in Section 40-1.14, "Payment," of the Standard Specifications is amended to read:

- The contract price paid per cubic yard for concrete pavement shall include full compensation for furnishing all labor, materials (including cementitious material in the amount specified), tools, equipment, and incidentals, and for doing all the work involved in constructing the portland cement concrete pavement, complete in place, as shown on the plans, and as specified in these specifications and the special provisions, and as directed by the Engineer.

SECTION 41: PAVEMENT SUBSEALING AND JACKING

Issue Date: January 5, 2007

The second paragraph of Section 41-1.02, "Materials," of the Standard Specifications is amended to read:

- Cement for grout shall be Type II portland cement conforming to the provisions in Section 90-2.01A, "Cement."

The third paragraph of Section 41-1.02, "Materials," of the Standard Specifications is amended to read:

- Fly ash shall conform to the requirements in AASHTO Designation: M 295 for either Class C or for Class F. The brand of fly ash used in the work shall conform to the provisions for approval of admixture brands in Section 90-4.03, "Admixture Approval."

The fifth paragraph of Section 41-1.02, "Materials," of the Standard Specifications is amended to read:

- Chemical admixtures and calcium chloride may be used. Chemical admixtures in the grout mix shall conform to the provisions in Section 90-4, "Admixtures." Calcium chloride shall conform to ASTM Designation: D 98.

SECTION 49: PILING

Issue Date: January 5, 2007

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

- Indicator compression pile load testing shall conform to the requirements in ASTM Designation: D 1143-81.

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

- Indicator tension pile load testing shall conform to the requirements in ASTM Designation: D 3689-90.

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

- The Contractor may use additional cementitious material in the concrete for the load test and anchor piles.

SECTION 50: PRESTRESSING CONCRETE

Issue Date: January 5, 2007

The seventh paragraph in Section 50-1.07, "Ducts," of the Standard Specifications is amended to read:

- All ducts with a total length of 400 feet or more shall be vented. Vents shall be placed at intervals of not more than 400 feet and shall be located within 6 feet of every high point in the duct profile. Vents shall be 1/2 inch minimum diameter standard pipe or suitable plastic pipe. Connections to ducts shall be made with metallic or plastic structural fasteners. Plastic components, if selected, shall not react with the concrete or enhance corrosion of the prestressing steel and shall be free of water soluble chlorides. The vents shall be mortar tight, taped as necessary, and shall provide means for injection of grout through the vents and for sealing the vents. Ends of vents shall be removed one inch below the roadway surface after grouting has been completed.

Item B of the eleventh paragraph in Section 50-1.08, "Prestressing," of the Standard Specifications is amended to read:

- B. When the concrete is designated by class or cementitious material content, either the concrete compressive strength shall have reached the strength shown on the plans at the time of stressing or at least 28 days shall have elapsed since the last concrete to be prestressed has been placed, whichever occurs first.

The second and third paragraphs in Section 50-1.09, "Bonding and Grouting," of the Standard Specifications are amended to read:

- Grout shall consist of cement and water and may contain an admixture if approved by the Engineer.
- Cement shall conform to the provisions in Section 90-2.01A, "Cement."

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

- No separate payment will be made for pretensioning precast concrete members. Payment for pretensioning precast concrete members shall be considered as included in the contract price paid for furnish precast members as provided for in Section 51, "Concrete Structures."

SECTION 51: CONCRETE STRUCTURES

Issue Date: January 19, 2007

The first sentence of the eleventh paragraph of Section 51-1.05, "Forms," of the Standard Specifications is amended to read:

- Form panels for exposed surfaces shall be furnished and placed in uniform widths of not less than 3 feet and in uniform lengths of not less than 6 feet, except at the end of continuously formed surfaces where the final panel length required is less than 6 feet.

The first sentence of the eleventh paragraph of Section 51-1.06C, "Removing Falsework," of the Standard Specifications is amended to read:

- Falsework for box culverts and other structures with decks lower than the roadway pavement and with span lengths of 14 feet or less shall not be released until the last placed concrete has attained a compressive strength of 1,600 psi, provided that curing of the concrete is not interrupted.

The fourth paragraph in Section 51-1.12D, "Sheet Packing, Preformed Pads, and Board Fillers," of the Standard Specifications is amended to read:

- Expanded polystyrene shall be a commercially available polystyrene board. Expanded polystyrene shall have a minimum flexural strength of 35 psi determined in conformance with the requirements in ASTM Designation: C 203 and a compressive yield strength of between 16 and 40 psi at 5 percent compression. Surfaces of expanded polystyrene against which concrete is placed shall be faced with hardboard. Hardboard shall be 1/8 inch minimum thickness, conforming to ANSI A135.4, any class. Other facing materials may be used provided they furnish equivalent protection. Boards shall be held in place by nails, waterproof adhesive, or other means approved by the Engineer.

The table in the sixth paragraph of Section 51-1.12F, "Sealed Joints," of the Standard Specifications is amended to read:

Movement Rating (MR)	Seal Type
MR ≤ 5/8 inch	Type A or Type B
5/8 inch < MR ≤ 1-1/4 inches	Type A (silicone only) or Type B
1-1/4 inches < MR ≤ 2 inches	Type B
2 inches < MR ≤ 4 inches	Joint Seal Assembly (Strip Seal)
MR > 4 inches	Joint Seal Assembly (Modular Unit) or Seismic Joint

The first sentence of the eleventh paragraph of Section 51-1.12F(3)(b), "Type B Seal," of the Standard Specifications is amended to read:

- Samples of the prefabricated joint seals, not less than 3 feet in length, will be taken by the Engineer from each lot of material.

The fourth and fifth sentences of the sixth paragraph of Section 51-1.12H(1), "Plain and Fabric Reinforced Elastomeric Bearing Pads," of the Standard Specifications are amended to read:

- Each ply of fabric shall have a breaking strength of not less than 800 pounds per inch of width in each thread direction when 3" x 36" samples are tested on split drum grips. The bond between double plies shall have a minimum peel strength of 20 pounds per inch.

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

Hardness (Type A)	D 2240 with 2kg mass.	55 ±5
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The first sentence of subparagraph A of the first paragraph of Section 51-1.12H(2), "Steel Reinforced Elastomeric Bearings," of the Standard Specifications is amended to read:

- The bearings shall consist of alternating steel laminates and internal elastomer laminates with top and bottom elastomer covers. Steel laminates shall have a nominal thickness of 0.075 inch (14 gage).

The first paragraph in Section 51-1.135, "Mortar," of the Standard Specifications is amended to read:

- Mortar shall be composed of cementitious material, sand, and water proportioned and mixed as specified in this Section 51-1.135.

The third paragraph in Section 51-1.135, "Mortar," of the Standard Specifications is amended to read:

- The proportion of cementitious material to sand, measured by volume, shall be one to 2 unless otherwise specified.

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

- The surfaces shall have a profile trace showing no high points in excess of 0.25 inch, and the portions of the surfaces within the traveled way shall have a profile count of 5 or less in any 100-foot section.

Section 51-1.17, "Finishing Bridge Decks," of the Standard Specifications is amended by adding the following subsection:

51-1.17A 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, before prestressing, and before the release of falsework. In any 500 square foot portion of deck within the limits of the new concrete deck, should the intensity of cracking be such that there are more than 16 feet of cracks whose width at any location exceeds 0.02 inch, 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 5 feet beyond the furthest single continuous crack outside the 500 square foot portion, measured from where that crack exceeds 0.02 inch in width, as determined by the Engineer.
- Deck crack treatment shall include furnishing, testing, and application of methacrylate resin and sand. If grinding is required, deck treatment shall take place before grinding.

51-1.17A(1) Submittals

- Before starting deck treatment, the Contractor shall submit plans in conformance with Section 5-1.02, "Plans and Working Drawings," for the following:

1. Public safety plan for the use of methacrylate resin
2. Placement plan for the construction operation

- The plans shall identify materials, equipment, and methods to be used.
- The public safety plan for the use of methacrylate resin shall include details for the following:

1. Shipping
2. Storage
3. Handling
4. Disposal of residual methacrylate resin and the containers

- The placement plan for construction shall include the following:

1. Schedule of deck treatment for each bridge. The schedule shall be consistent with "Maintaining Traffic" of the special provisions and shall include time for the Engineer to perform California Test 342.
2. Methods and materials to be used, including the following:
 - 2.1. Description of equipment for applying the resin
 - 2.2. Description of equipment for applying the sand

2.3. Gel time range and final cure time for the resin

- If the measures proposed in the safety plan are inadequate to provide for public safety associated with the use of methacrylate resin, the Engineer will reject the plan and direct the Contractor to revise the plan. Directions for revisions will be in writing and include detailed comments. The Engineer will notify the Contractor of the approval or rejection of a submitted or revised plan within 15 days of receipt of that plan.
- 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."

51-1.17A(2) Materials

- Before using methacrylate resin, a Material Safety Data Sheet shall be submitted for each shipment of resin.
- Methacrylate resin shall be low odor and have a high molecular weight. Before adding initiator, the resin shall have a maximum volatile content of 30 percent when tested in conformance with the requirements in ASTM Designation: D 2369, and shall conform to the following:

PROPERTY	REQUIREMENT	TEST METHOD
* Viscosity	25 cP, maximum, (Brookfield RVT with UL adaptor, 50 RPM at 77°F	ASTM D 2196
* Specific Gravity	0.90 minimum, at 77°F	ASTM D 1475
* Flash Point	180°F, minimum	ASTM D 3278
* Vapor Pressure	1.0 mm Hg, maximum, at 77°F	ASTM D 323
Tack-free Time	400 minutes, maximum at 25°C	Specimen prepared per California Test 551
PCC Saturated Surface-Dry Bond Strength	3.5 MPa, minimum at 24 hours and 21±1°C	California Test 551
* Test shall be performed before adding initiator.		

51-1.17A(3) Testing

- The Contractor shall allow 20 days for sampling and testing by the Engineer of the methacrylate resin before proposed use. If bulk resin is to be used, the Contractor shall notify the Engineer in writing at least 15 days before the delivery of the bulk resin to the job site. Bulk resin is any resin stored in containers in excess of 55 gallons.
- Before starting production treatment, the Contractor shall treat a test area of approximately 500 square feet that is within the project limits and at a location approved by the Engineer. When available the test area shall be outside of the traveled way. Weather and pavement conditions during the test treatment shall be similar to those expected on the deck. Equipment used for testing shall be similar to those used for deck treating operations.
- During test and production deck treatment, test tiles shall be used to evaluate the resin cure time. The Contractor shall coat at least one 4" x 4" commercial quality smooth glazed tile for each batch of methacrylate resin. The coated tile shall be placed adjacent to the corresponding treated area. Sand shall not be applied to the test tiles.
- The acceptance criteria for a treated area is as follows:
 1. The test tiles are dry to the touch.
 2. The treated deck surface is tack free (non-oily).
 3. The sand cover adheres and resists brushing by hand.
 4. Excess sand has been removed by vacuuming or sweeping.
 5. The coefficient of friction is at least 0.35 when tested in conformance with California Test 342.
- Deck treatment on the test area shall demonstrate that the methods and materials meet the acceptance criteria and that the production work will be completed within the specified time for maintaining traffic.

- If a test or production area fails to meet the acceptance criteria, as determined by the Engineer, the treatment will be rejected, and the treatment shall be removed and replaced until the area complies with the acceptance criteria.

51-1.17A(4) Construction

- 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.
- Before 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 before placing the resin, the deck surface shall be cleaned by abrasive blasting.
- Where abrasive blasting is being performed within 10 feet 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.
- A compatible promoter/initiator system shall be capable of providing the resin gel time range shown on the placement plan. Gel time shall be adjusted to compensate for the changes in temperature throughout treatment application.
- Resin shall be applied by machine and by using a two-part resin system with 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.
- At the Contractor's option, manual application may be used when necessary to prevent overspray of resin onto adjacent traffic. For manual application, the quantity of resin mixed with promoter and initiator shall be limited to 5 gallons at a time.
- The Contractor shall apply methacrylate resin only to the specified area. Barriers, railing, 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 relative humidity shall be less than 90 percent at the time of treatment. The prepared area shall be dry and the surface temperature shall be at least 50°F and not more than 100°F when the resin is applied. The rate of application of promoted/initiated resin shall be approximately 90 square feet per gallon; the exact rate shall be determined by the Engineer.
- The deck surfaces to be treated shall be completely covered with resin so the resin penetrates and fills all cracks. The resin 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. For textured deck surfaces, including grooved surfaces, excess material shall be removed from the texture indentations.
- After the resin has been applied, at least 20 minutes shall elapse before applying sand. The sand shall be commercial quality dry blast sand. At least 95 percent of the sand shall pass the No. 8 sieve and at least 95 percent shall be retained on the No. 20 sieve. The sand shall be applied at a rate of approximately 2 pounds per square foot or until refusal as determined by the Engineer.
- Traffic will not be allowed on treated areas until the acceptance criteria has been met as determined by the Engineer.

The second paragraph in Section 51-1.18C, "Class 2 Surface Finish (Gun Finish)," of the Standard Specifications is amended to read:

- When Class 2 surface finish (gun finish) is specified, ordinary surface finish shall first be completed. The concrete surfaces shall then be abrasive blasted to a rough texture and thoroughly washed down with water. While the washed surfaces are damp, but not wet, a finish coating of machine applied mortar, approximately 1/4 inch thick, shall be applied in not less than 2 passes. The coating shall be pneumatically applied and shall consist of either (1) sand, cementitious material, and water mechanically mixed prior to its introduction to the nozzle, or (2) premixed sand and cementitious material to which water is added prior to its expulsion from the nozzle. The use of admixtures shall be subject to the approval of the Engineer as provided in Section 90, "Portland Cement Concrete." Unless otherwise specified, supplementary cementitious materials will not be required. The proportion of cementitious material to sand shall be not less than one to 4, unless otherwise directed by the Engineer. Sand shall be of a grading suitable for the purpose intended. The machines shall be operated and the coating shall be applied in conformance with standard practice. The coating shall be firmly bonded to the concrete surfaces on which it is applied.

The fifth paragraph in Section 51-1.18C, "Class 2 Surface Finish (Gun Finish)," of the Standard Specifications is amended to read:

- When surfaces to be finished are in pedestrian undercrossings, the sand shall be silica sand and the cementitious material shall be standard white portland cement.

Section 51-1.23, "Payment," of the Standard Specifications is amended by adding the following:

- Full compensation for deck crack treatment, including execution of the public safety plan, shall be considered as included in the contract price paid per cubic yard for structural concrete, bridge, and no additional compensation will be allowed therefor.

SECTION 52: REINFORCEMENT

Issue Date: May 30, 2006

The table in the eleventh paragraph of Section 52-1.07, "Placing," of the Standard Specifications is amended to read:

Height Zone (H) (Feet above ground)	Wind Pressure Value (psf)
H ≤ 30	20
30 < H ≤ 50	25
50 < H ≤ 100	30
H > 100	35

The table in the second paragraph of Section 52-1.08B(1), "Mechanical Splices," of the Standard Specifications is amended to read:

Reinforcing Bar Number	Total Slip
4	0.010-inch
5	0.010-inch
6	0.010-inch
7	0.014-inch
8	0.014-inch
9	0.014-inch
10	0.018-inch
11	0.018-inch
14	0.024-inch
18	0.030-inch

The subparagraph under the sixth paragraph of Section 52-1.08B(2), "Butt Welded Splices," of the Standard Specifications is amended to read:

- The minimum preheat and interpass temperatures shall be 400° F for Grade 40 bars and 600° F for Grade 60 bars. Immediately after completing the welding, at least 6 inches of the bar on each side of the splice shall be covered by an insulated wrapping to control the rate of cooling. The insulated wrapping shall remain in place until the bar has cooled below 200° F.

The first sentence of the fifth paragraph of Section 52-1.08C, "Service Splice and Ultimate Butt Splice Testing Requirements," of the Standard Specifications is amended to read:

- Prequalification and production sample splices shall be 1) a minimum length of 5 feet for reinforcing bars No. 9 and smaller, and 6.5 feet for reinforcing bars No. 10 and larger, with the splice located at mid-point; and 2) suitably identified before shipment with weatherproof markings that do not interfere with the Engineer's tamper-proof markings or seals.

The second sentence of the second paragraph of Section 52-1.08C(3), "Ultimate Butt Splice Test Criteria," of the Standard Specifications is amended to read:

- Control bars shall be 1) a minimum length of 5 feet for reinforcing bars No. 9 and smaller, and 6.5 feet for reinforcing bars No. 10 and larger, and 2) suitably identified before shipment with weatherproof markings that do not interfere with the Engineer's tamper-proof markings or seals.

SECTION 53: SHOTCRETE

Issue Date: January 5, 2007

The third paragraph in Section 53-1.01, "Description," of the Standard Specifications is amended to read:

- The dry-mix process shall consist of delivering dry mixed aggregate and cementitious material pneumatically or mechanically to the nozzle body and adding water and mixing the materials in the nozzle body. The wet-mix process shall consist of delivering mixed aggregate, cement, and water pneumatically to the nozzle and adding any admixture at the nozzle.

The first through fourth paragraphs in Section 53-1.02, "Materials," of the Standard Specifications is amended to read:

- Cementitious material, fine aggregate, and mixing water shall conform to the provisions in Section 90, "Portland Cement Concrete."
 - Shotcrete to be mixed and applied by the dry-mix process shall consist of one part cementitious material to not more than 4.5 parts fine aggregate, thoroughly mixed in a dry state before being charged into the machine. Measurement may be either by volume or by weight. The fine aggregate shall contain not more than 6 percent moisture by weight.
 - Shotcrete to be mixed and applied by the wet-mix process shall consist of cementitious material, fine aggregate, and water and shall contain not less than 632 pounds of cementitious material per cubic yard. A maximum of 30 percent pea gravel may be substituted for fine aggregate. The maximum size of pea gravel shall be such that 100 percent passes the 1/2 inch screen and at least 90 percent passes the 3/8 inch screen.
 - Admixtures may be added to shotcrete and shall conform to the provisions in Section 90-4, "Admixtures."

Item C of the third paragraph in Section 53-1.04, "Placing Shotcrete," of the Standard Specifications is amended to read:

- C. Aggregate and cementitious material that have been mixed for more than 45 minutes shall not be used unless otherwise permitted by the Engineer.

SECTION 55: STEEL STRUCTURES

Issue Date: January 5, 2007

The CVN impact value for Grade HPS 50W in the table in the fifth paragraph of Section 55-2.01, "Description," of the Standard Specifications is amended to read:

Grade HPS 50W* (4 inches and under in thickness)	20 at 10° F
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The first paragraph in Section 55-3.05, "Flatness of Faying and Bearing Surfaces," of the Standard Specifications is amended to read:

- Surfaces of bearing and base plates and other metal surfaces that are to come in contact with each other or with ground concrete surfaces or with asbestos sheet packing shall be flat to within 1/32-inch tolerance in 12 inches and to within 1/16-inch tolerance overall. Surfaces of bearing and base plates and other metal bearing surfaces that are to come in contact with preformed fabric pads, elastomeric bearing pads, or mortar shall be flat to within 1/8-inch tolerance in 12 inches and to within 3/16-inch tolerance overall.

Item B of the first paragraph of Section 55-3.10, "Fastener Threads," of the Standard Specifications is amended to read:

- B. Internal threads shall conform to the requirements in ASTM Designation: A 563.

The third paragraph in Section 55-3.19, "Bearings and Anchorages," of the Standard Specifications is amended to read:

- Immediately before setting bearing assemblies or masonry plates directly on ground concrete surfaces, the Contractor shall thoroughly clean the surfaces of the concrete and the metal to be in contact and shall apply a coating of nonsag polysulfide or polyurethane caulking conforming to the requirements in ASTM Designation: C 920 to contact areas to provide full bedding.

The fifth paragraph in Section 55-3.19, "Bearings and Anchorages," of the Standard Specifications is amended to read:

- Mortar to be placed below masonry plates or bearing plates of the bearing assemblies and in anchor bolt sleeves or canisters shall conform to the provisions in Section 51-1.135, "Mortar," except that the proportion of cementitious material to sand shall be 1:3.

Item D of the first paragraph of Section 55-4.01, "Measurement," of the Standard Specifications is amended to read:

D. To determine the pay quantities of galvanized metal, the weight to be added to the calculated weight of the base metal for the galvanizing will be determined from the table of weights of zinc coatings specified in ASTM Designation: A 153/A 153M.

SECTION 56: SIGNS

Issue Date: January 5, 2007

The fifth paragraph in Section 56-1.03, "Fabrication," of the Standard Specifications is amended to read:

- Clips, eyes, or removable brackets shall be affixed to all signs and all posts and shall be used to secure the sign during shipping and for lifting and moving during erection as necessary to prevent damage to the finished galvanized or painted surfaces. Brackets on tubular sign structures shall be removed after erection. Details of the devices shall be shown on the working drawings.

The fourth paragraph in Section 56-2.03, "Construction," of the Standard Specifications is amended to read:

- Backfill material for metal posts shall consist of minor concrete conforming to the provisions in Section 90-10, "Minor Concrete," and shall contain not less than 463 pounds of cementitious material per cubic yard.

SECTION 59: PAINTING

Issue Date: May 1, 2006

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

- Contact surfaces of stiffeners, railings, built up members or open seam exceeding 6 mils in width that would retain moisture, shall be caulked with polysulfide or polyurethane sealing compound conforming to the requirements in ASTM Designation: C 920, Type S, Grade NS, Class 25, Use O, or other approved material.

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 in SSPC-PA 2, "Measurement of Dry Coating Thickness with Magnetic Gages," of the "SSPC: The Society for Protective Coatings," except that there shall be no limit to the number or location of spot measurements to verify compliance with specified thickness requirements.

SECTION 64: PLASTIC PIPE

Issue Date: January 5, 2007

The first paragraph of Section 64-1.06, "Concrete Backfill," of the Standard Specifications is amended to read:

- At locations where pipe is to be backfilled with concrete as shown on the plans, the concrete backfill shall be constructed of minor concrete or Class 4 concrete conforming to the provisions in Section 90, "Portland Cement Concrete." Minor concrete shall contain not less than 380 pounds of cementitious material per cubic yard. The concrete to be used will be designated in the contract item or shown on the plans.

SECTION 65: REINFORCED CONCRETE PIPE

Issue Date: January 5, 2007

The first paragraph of Section 65-1.02, "Materials," of the Standard Specifications is amended to read:

- Cementitious material and aggregate shall conform to the provisions in Section 90-2, "Materials" except that mortar strengths relative to Ottawa sand and grading requirements shall not apply to the aggregate. Use of supplemental cementitious material shall conform to AASHTO Designation: M 170.

Subparagraph "c" of the eleventh paragraph of Section 65-1.02A(1) "Circular Reinforced Concrete Pipe (Designated or Selected by Class)," of the Standard Specifications is amended to read:

- c. Cementitious material and aggregate for non-reinforced concrete pipe shall conform to the provisions in Section 65-1.02, "Materials."

The first paragraph of Section 65-1.035, "Concrete Backfill," of the Standard Specifications is amended to read:

- At locations where pipe is to be backfilled with concrete as shown on the plans, the concrete backfill shall be constructed of minor concrete or Class 4 concrete in conformance with the provisions in Section 90, "Portland Cement Concrete." Minor concrete shall contain not less than 380 pounds of cementitious material per cubic yard. The concrete to be used will be designated in the contract item.

The first subparagraph of the second paragraph of Section 65-1.06, "Joints," of the Standard Specifications is amended to read:

Cement Mortar.- Mortar shall be composed of one part cementitious material and 2 parts sand by volume. Supplementary cementitious material will not be required.

SECTION 66: CORRUGATED METAL PIPE

Issue Date: January 5, 2007

The first paragraph of Section 66-1.045, "Concrete Backfill," of the Standard Specifications is amended to read:

- At locations where pipe is to be backfilled with concrete as shown on the plans, the concrete backfill shall be constructed of minor concrete or Class 4 concrete conforming to the provisions in Section 90, "Portland Cement Concrete." Minor concrete shall contain not less than 380 pounds of cementitious material per cubic yard. The concrete to be used will be designated in the contract item or shown on the plans.

SECTION 68: SUBSURFACE DRAINS

Issue Date: January 5, 2007

The first and second paragraphs of Section 68-3.02D, "Miscellaneous," of the Standard Specifications are amended to read:

- Concrete for splash pads shall be produced from minor concrete conforming to the provisions in Section 90-10, "Minor Concrete." Minor concrete shall contain not less than 470 pounds of cementitious material per cubic yard.
- Mortar placed where edge drain outlets and vents connect to drainage pipe and existing drainage inlets shall conform to the provisions in Section 51-1.135, "Mortar."

SECTION 70: MISCELLANEOUS FACILITIES

Issue Date: January 5, 2007

The second paragraph of Section 70-1.02C, "Flared End Sections," of the Standard Specifications is amended to read:

- Precast concrete flared end sections shall conform to the requirements for Class III Reinforced Concrete Pipe in AASHTO Designation: M 170M. Cementitious materials and aggregate shall conform to the provisions in Section 90-2, "Materials," except that mortar strengths relative to Ottawa sand and grading requirements shall not apply to the aggregate. Use of supplementary cementitious material shall conform to the requirements in AASHTO Designation: M 170. The area of steel reinforcement per meter of flared end section shall be at least equal to the minimum steel requirements for circular reinforcement in circular pipe for the internal diameter of the circular portion of the flared end section. The basis of acceptance of the precast concrete flared end section shall conform to the requirements of Section 5.1.2 of AASHTO Designation: M 170.

The first paragraph of Section 70-1.02H, "Precast Concrete Structures," of the Standard Specifications is amended to read:

- Precast concrete pipe risers and pipe reducers, and precast concrete pipe sections, adjustment rings and tapered sections for pipe energy dissipators, pipe inlets and pipe manholes shall conform to the requirements in AASHTO Designation: M 199M/M 199, except that the cementitious material and aggregate shall conform to the provisions in Section 90-2, "Materials," except that mortar strengths relative to Ottawa sand and grading requirements shall not apply to the aggregate. Use of supplementary cementitious material shall conform to the requirements in AASHTO Designation: M 170.

The second paragraph of Section 70-1.03, "Installation," of the Standard Specifications is amended to read:

- Cutoff walls for precast concrete flared end sections shall be constructed of minor concrete conforming to the provisions in Section 90-10, "Minor Concrete." Minor concrete shall contain not less than 470 pounds of cementitious material per cubic yard.

SECTION 73: CONCRETE CURBS AND SIDEWALKS

Issue Date: January 5, 2007

The second subparagraph of the second paragraph of Section 73-1.01, "Description," of the Standard Specifications is amended to read:

2. Minor concrete shall contain not less than 463 pounds of cementitious material per cubic yard except that when extruded or slip-formed curbs are constructed using 3/8-inch maximum size aggregate, minor concrete shall contain not less than 548 pounds of cementitious material per cubic yard.

SECTION 75: MISCELLANEOUS METAL

Issue Date: January 5, 2007

The last sentence of the thirteenth paragraph of Section 75-1.03, "Miscellaneous Bridge Metal," of the Standard Specifications is amended to read:

- Thread dimensions for internally threaded concrete anchorage devices shall conform to the requirements in ASTM Designation: A 563.

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

- Sealing compound, for caulking and adhesive sealing, shall be a polysulfide or polyurethane material conforming to the requirements in ASTM Designation: C 920, Type S, Grade NS, Class 25, Use O.

Item C of the fourth paragraph of Section 75-1.035, "Bridge Joint Restrainer Units," of the Standard Specifications is amended to read:

- C. Nuts shall conform to the requirements in ASTM Designation: A 563 including Appendix X1, except lubrication is not required.

The twelfth paragraph in Section 75-1.035, "Bridge Joint Restrainer Units," of the Standard Specifications is amended to read:

- Concrete for filling cable drum units shall conform to the provisions in Section 90-10, "Minor Concrete," or at the option of the Contractor, may be a mix with 3/8-inch maximum size aggregate and not less than 675 pounds of cementitious material per cubic yard.

The sixth paragraph of Section 75-1.05, "Galvanizing," of the Standard Specifications is amended to read:

- Galvanizing of iron and steel hardware and nuts and bolts, when specified or shown on the plans, shall conform to the requirements in ASTM Designation: A 153/A 153M, except whenever threaded studs, bolts, nuts, and washers are specified to conform to the requirements in ASTM Designation: A 307, A 325, A 449, A 563, or F 436 and zinc coating is required, they shall be hot-dip zinc coated or mechanically zinc coated in conformance with the requirements in the ASTM Designations. Unless otherwise specified, galvanizing shall be performed after fabrication.

The eighth paragraph of Section 75-1.05, "Galvanizing," of the Standard Specifications is amended to read:

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

SECTION 80: FENCES

Issue Date: January 5, 2007

The fourth paragraph of Section 80-3.01F, "Miscellaneous," of the Standard Specifications is amended to read:

- Portland cement concrete for metal post and brace footings and for deadmen shall be minor concrete conforming to the provisions in Section 90-10, "Minor Concrete." Minor concrete shall contain not less than 470 pounds of cementitious material per cubic yard.

The fourth paragraph of Section 80-4.01C, "Miscellaneous," of the Standard Specifications is amended to read:

- Portland cement concrete for metal post and for deadmen shall be produced from minor concrete conforming to the provisions in Section 90-10, "Minor Concrete." Minor concrete shall contain not less than 470 pounds of cementitious material per cubic yard.

SECTION 83: RAILINGS AND BARRIERS

Issue Date: January 5, 2007

The seventh paragraph in Section 83-1.02, "Materials and Construction," of the Standard Specifications is amended to read:

- Mortar shall conform to the provisions in Section 51-1.135, "Mortar," and shall consist of one part by volume of cementitious material and 3 parts of clean sand.

Item b of the first paragraph in Section 83-2.02D(2), "Materials," of the Standard Specifications is amended to read:

- b. If the 3/8-inch maximum size aggregate grading is used to construct extruded or slip-formed concrete barriers, the cementitious material content of the minor concrete shall be not less than 675 pounds per cubic yard.

The third paragraph in Section 83-2.02D(2), "Materials," of the Standard Specifications is amended to read:

- The concrete paving between the tops of the 2 walls of concrete barrier (Types 50E, 60E, 60GE, and 60SE) and the optional concrete slab at the base between the 2 walls of concrete barrier (Types 50E, 60E, 60GE, and 60SE) shall be constructed of minor concrete conforming to the provisions of Section 90-10, "Minor Concrete," except that the minor concrete shall contain not less than 505 pounds of cementitious material per cubic yard.

SECTION 86: SIGNALS, LIGHTING AND ELECTRICAL SYSTEMS

Issue Date: January 5, 2007

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

- After each post, standard, and pedestal on structures is in proper position, mortar shall be placed under the base plate as shown on the plans. The exposed portions shall be formed to present a neat appearance. Mortar shall conform to Section 51-1.135, "Mortar," except the mortar shall consist of one part by volume of cementitious material and 3 parts of clean sand and shall contain only sufficient moisture to permit packing. Mortar shall be cured by keeping it damp for 3 days.

Item D of the eighteenth paragraph in Section 86-2.05C, "Installation," of the Standard Specifications is amended to read:

- D. The conduit shall be placed in the bottom of the trench, and the trench shall be backfilled with minor concrete conforming to the provisions in Section 90-10, "Minor Concrete." Minor concrete shall contain not less than 590 pounds of cementitious material per cubic yard. Concrete backfill shall be placed to the pavement surface except, when the trench is in asphalt concrete pavement and additional pavement is not being placed, the top 0.10 foot of the trench shall be backfilled with asphalt concrete produced from commercial quality paving asphalt and aggregates.

Item C of the twenty-third paragraph in Section 86-2.05C, "Installation," of the Standard Specifications is amended to read:

- C. Precast concrete conduit cradles shall conform to the dimensions shown on the plans and shall be constructed of minor concrete and commercial quality welded wire fabric. Minor concrete shall conform to the provisions in Section 90-10, "Minor Concrete," and shall contain not less than 590 pounds of cementitious material per cubic yard. The cradles shall be moist cured for not less than 3 days.

Item G of the twenty-third paragraph in Section 86-2.05C, "Installation," of the Standard Specifications is amended to read:

- G. The space around conduits through bridge abutment walls shall be filled with mortar conforming to the provisions in Section 51-1.135, "Mortar," except that the proportion of cementitious material to sand shall be one to 3.

The fifth paragraph in Section 86-2.07, "Traffic Pull Boxes," of the Standard Specifications is amended to read:

- Concrete placed around and under traffic pull boxes as shown on the plans shall be minor concrete conforming to the provisions in Section 90-10, "Minor Concrete."

The traffic signal controller cabinet requirement in the table in Section 86-2.08A, "Conductor Identification," of the Standard Specifications is amended to read:

Traffic Signal	Ungrounded Circuit Conductor	Blk	None	CON-1	6
Controller Cabinet	Grounded Circuit Conductor	Wht	None	CON-2	6

The first sentence of the first paragraph of Section 86-4.06, "Pedestrian Signal Faces," of the Standard Specifications is amended to read:

- Message symbols for pedestrian signal faces shall be white WALKING PERSON and Portland orange UPRAISED HAND conforming to the requirements in the Institute of Transportation Engineers Standards: "Pedestrian Traffic Control Signal Indications" and the "California MUTCD."

The second sentence of the tenth paragraph of Section 86-4.07, "Light Emitting Diode Pedestrian Signal Face 'Upraised Hand' Module," of the Standard Specifications is amended to read:

- The color of "UPRAISED HAND" shall be Portland orange conforming to the requirements of the Institute of Transportation Engineers Standards: "Pedestrian Traffic Control Signal Indications" and the "California MUTCD."

The first paragraph in Section 86-5.01D, "Removing or Abandoning Existing Pressure-Sensitive Detectors," of the Standard Specifications is amended to read:

- When a foundation for a pressure-sensitive vehicle detector is to be removed, the hole left by removing the detector frame and foundation shall be filled with minor concrete, except the roadway surface shall be reconstructed with material to match existing surfacing. Minor concrete shall conform to the provisions in Section 90-10, "Minor Concrete," except that the concrete shall contain not less than 420 pounds of cementitious material per cubic yard for asphalt concrete surfaced roadways and not less than 590 pounds of cementitious material per cubic yard for portland cement concrete surfaced roadways.

The first paragraph of Section 86-8.01, "Payment," of the Standard Specifications is amended to read:

- The contract lump sum price or prices paid for signal, ramp metering, flashing beacon, lighting, sign illumination, traffic monitoring station, highway advisory radio systems, closed circuit television systems, or combinations thereof; for modifying or removing those systems; for temporary systems; or the lump sum or unit prices paid for various units of those systems; or the lump sum or per foot price paid for conduit of the various sizes, types and installation methods listed in the Engineer's Estimate shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all the work involved in furnishing and installing, modifying, or removing the systems, combinations or units thereof, as shown on the plans, as specified in these specifications and the special provisions, and as directed by the Engineer, including any necessary pull boxes (except when the type required is shown as a separate contract item); excavation and backfill; concrete foundations (except when shown as a separate contract item); pedestrian barricades; furnishing and installing illuminated street name signs; installing sign panels on pedestrian barricades, on flashing beacon standards, and on traffic signal mast arms; restoring sidewalk, pavement and appurtenances damaged or destroyed during construction; salvaging existing materials; and making all required tests.

SECTION 90: PORTLAND CEMENT CONCRETE

Issue Date: January 5, 2007

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.
- Class 1 concrete shall contain not less than 675 pounds of cementitious material per cubic yard.
- Class 2 concrete shall contain not less than 590 pounds of cementitious material per cubic yard.
- Class 3 concrete shall contain not less than 505 pounds of cementitious material per cubic yard.
- Class 4 concrete shall contain not less than 420 pounds of cementitious material per cubic yard.
- Minor concrete shall contain not less than 550 pounds of cementitious material per cubic yard unless otherwise specified in these specifications or the special provisions.
- Unless otherwise designated on the plans or specified in these specifications or the special provisions, the amount of cementitious material used per cubic yard of concrete in structures or portions of structures shall conform to the following:

Use	Cementitious Material Content (Pounds/CY)
Concrete designated by compressive strength:	
Deck slabs and slab spans of bridges	675 min., 800 max.
Roof sections of exposed top box culverts	675 min., 800 max.
Other portions of structures	590 min., 800 max.
Concrete not designated by compressive strength:	
Deck slabs and slab spans of bridges	675 min.
Roof sections of exposed top box culverts	675 min.
Prestressed members	675 min.
Seal courses	675 min.
Other portions of structures	590 min.
Concrete for precast members	590 min., 925 max.

- Whenever the 28-day compressive strength shown on the plans is greater than 3,600 pounds per square inch, the concrete shall be designated by compressive strength. If the plans show a 28-day compressive strength that is 4,000 pounds per square inch 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 3,600 pounds per square inch 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, supplementary cementitious material 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 supplementary cementitious material 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 \$0.25 for each pound of cementitious material, portland cement, or supplementary cementitious material 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 CEMENTITIOUS MATERIALS

- Unless otherwise specified, cementitious material shall be either a combination of Type II or Type V portland cement and a supplementary cementitious material, or a blended cement.
- Cementitious materials used in cast-in-place concrete for exposed surfaces of like elements of a structure shall be from the same sources and of the same proportions.
- Cementitious materials shall be protected from moisture until used. Sacked cementitious materials shall be piled to permit access for tallying, inspecting, and identifying each shipment.
- Facilities shall be provided to ensure that cementitious materials meeting this Section 90-2.01 are kept separate from other cementitious materials. Sampling cementitious materials shall be in conformance with California Test 125.
- The Contractor shall furnish a Certificate of Compliance for cementitious materials in conformance with the provisions in Section 6-1.07, "Certificates of Compliance." The Certificate of Compliance shall indicate the source by name and location (including country, state, and city). If cementitious material is delivered directly to the job site, the Certificate of Compliance shall be signed by the cementitious material supplier. If the cementitious material 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.

90-2.01A CEMENT

- Portland cement shall conform to the requirements in ASTM Designation: C 150 except, using a 10-sample moving average, limestone shall not exceed 2.5 percent. The C_3S content of Type II cement shall not exceed 65 percent.
- Blended cement shall conform to the requirements for Portland Blast-Furnace Slag, Cement Type IS (MS) or Portland-Pozzolan Cement, Type IP (MS) in AASHTO Designation: M 240 and shall be comprised of an intimate and uniform blend of Type II or Type V cement and supplementary cementitious material in an amount conforming to the requirements in Section 90-2.01C, "Required Use of Supplementary Cementitious Materials."
- In addition, blended cement, Type II portland cement, and Type V portland cement shall conform to the following requirements:
 - A. The cement shall not contain more than 0.60-percent by mass of alkalis, calculated as the percentage of Na_2O plus 0.658 times the percentage of K_2O , when determined by methods as required in AASHTO Designation: T 105;
 - 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 portland cement shall be used only as specified in the special provisions or with the approval of the Engineer. Type III portland cement shall conform to the additional requirements listed above for Type II portland cement, except when tested in conformance with California Test 527, mortar containing Type III portland cement shall not contract in air more than 0.075-percent.

90-2.01B SUPPLEMENTARY CEMENTITIOUS MATERIALS (SCM)

- Fly ash shall conform to the requirements in AASHTO Designation: M 295, Class F, and the following:
 - A. Calcium oxide content shall not exceed 10 percent.
 - B. The available alkali, as sodium oxide equivalent, shall not exceed 1.5 percent when determined in conformance with the requirements in ASTM Designation: C 311 or the total alkali, as sodium oxide equivalent, shall not exceed 5.0 percent when determined in conformance with the requirements in AASHTO Designation: T 105.
 - C. Commingling of fly ash from different sources at uncontrolled ratios is permissible only if the following criteria are satisfied:
 1. Sources of fly ash to be commingled shall be on the approved list of materials for use in concrete.
 2. Testing of the commingled product is the responsibility of the fly ash supplier.
 3. Each fly ash's running average of density shall not differ from any other by more than 0.01-pound per cubic inch at the time of commingling.
 4. Each fly ash's running average of loss on ignition shall not differ from any other by more than one percent at the time of commingling.

5. The final product of commingled fly ash shall conform to the requirement in AASHTO Designation: M 295.

- Raw or calcined natural pozzolans shall conform to the requirements in AASHTO Designation: M 295, Class N and the following requirements:

- A. Calcium oxide content shall not exceed 10 percent.

- B. The available alkali, as sodium oxide equivalent, shall not exceed 1.5 percent when determined in conformance with the requirements in ASTM Designation: C 311 or the total alkali, as sodium oxide equivalent, shall not exceed 5.0 percent when determined in conformance with the requirements in AASHTO Designation: T 105.

- Ground Granulated Blast Furnace Slag (GGBFS) shall conform to the requirements in AASHTO Designation: M 302, Grade 100 or Grade 120.

- Silica Fume shall conform to the requirements of AASHTO Designation: M 307, with reduction in mortar expansion of 80 percent, minimum, using the cement from the proposed mix design.

90-2.01C REQUIRED USE OF SUPPLEMENTARY CEMENTITIOUS MATERIALS

- The amount of portland cement and SCM used in portland cement concrete shall conform to the minimum cementitious material content provisions in Section 90-1.01, "Description," or Section 90-4.05, "Optional Use of Chemical Admixtures," and the following:

- A. If a blended cement conforming to the provisions in Section 90-2.01A, "Cement," is used, the minimum amount of SCM incorporated into the cement shall conform to the provisions in this Section 90-2.01C.

- B. Fly ash or natural pozzolan, silica fume, or GGBFS shall not be used with Type IP or Type IS cements.

- Use of SCMs shall conform to the following:

- A. If fly ash or natural pozzolan is used:

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

- 2. The minimum amount of fly ash or natural pozzolan shall be:

- a. Fifteen percent by weight of the total amount of cementitious material if the calcium oxide content of fly ash or natural pozzolan is equal to or less than 2 percent by weight;

- b. Twenty-five percent by weight of the total amount of cementitious material if the calcium oxide content of fly ash or natural pozzolan is greater than 2 percent by weight.

- 3. The total amount of fly ash or natural pozzolan shall not exceed 35 percent by weight of the total amount of cementitious material to be used in the mix. If Section 90-1.01, "Description," specifies a maximum cementitious material content in pounds per cubic yard, the total weight of portland cement and fly ash or natural pozzolan per cubic yard shall not exceed the specified maximum cementitious material content.

- B. If silica fume is used:

- 1. The amount of silica fume shall not be less than 10 percent by weight of the total amount of cementitious material.

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

- 3. If Section 90-1.01, "Description," specifies a maximum cementitious material content in pounds per cubic yard, the total weight of portland cement and silica fume per cubic yard shall not exceed the specified maximum cementitious material content.

- C. If GGBFS is used:

- 1. The minimum amount of GGBFS shall be either:

- a. Forty percent of the total cementitious material to be used, if the aggregates used in the concrete are on the Department's list of "Approved Aggregates For Use in Concrete with

- Reduced Fly Ash."
 - b. No less than 50 percent.

2. The amount of GGBFS shall not exceed 60 percent by weight of the total amount of cementitious materials to be used.

90-2.02 AGGREGATES

- Aggregates shall be free from deleterious coatings, clay balls, roots, bark, sticks, rags, and other extraneous material.
- The Contractor 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 \$3.50 per cubic yard for paving concrete and \$5.50 per cubic yard 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 \$3.50 per cubic yard for paving concrete and \$5.50 per cubic yard 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 are 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 300 cubic yards 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, reclaimed aggregate, 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.
- Reclaimed aggregate is aggregate that has been recovered from plastic concrete by washing away the cementitious material. Reclaimed aggregate shall conform to all aggregate requirements.
- 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:

- A. Coarse aggregate sampled at the completion of processing at the aggregate production plant had a Cleanness Value of not less than 82 when tested in conformance with the requirements in California Test 227; and
- B. 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:

- A. 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
- B. 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 1,000 parts per million of chlorides as Cl, when tested in conformance with California Test 422, nor more than 1,300 parts per million of sulfates as SO₄, 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 1,300 parts per million of sulfates as SO₄, 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 nonreinforced concrete work, the water for curing, for washing aggregates and for mixing shall be free from oil and shall not contain more than 2,000 parts per million of chlorides as Cl, when tested in conformance with California Test 422, or more than 1,500 parts per million of sulfates as SO₄, 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 (Na₂O + 0.658 K₂O) 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.

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
1 1/2" x 3/4"	1"	19 - 41
1" x No. 4	3/4"	52 - 85
1" x No. 4	3/8"	15 - 38
1/2" x No. 4	3/8"	40 - 78
3/8" x No. 8	3/8"	50 - 85
Fine Aggregate	No. 16	55 - 75
Fine Aggregate	No. 30	34 - 46
Fine Aggregate	No. 50	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:

Sieve Sizes	Percentage Passing Primary Aggregate Nominal Sizes							
	1 1/2" x 3/4"		1" x No. 4		1/2" x No. 4		3/8" x No. 8	
	Operating Range	Contract Compliance	Operating Range	Contract Compliance	Operating Range	Contract Compliance	Operating Range	Contract Compliance
2"	100	100	—	—	—	—	—	—
1 1/2"	88 - 100	85 - 100	100	100	—	—	—	—
1"	X ±18	X ±25	88 - 100	86 - 100	—	—	—	—
3/4"	0 - 17	0 - 20	X ±15	X ±22	100	100	—	—
1/2"	—	—	—	—	82 - 100	80 - 100	100	100
3/8"	0 - 7	0 - 9	X ±15	X ±22	X ±15	X ±22	X ±15	X ±20
No. 4	—	—	0 - 16	0 - 18	0 - 15	0 - 18	0 - 25	0 - 28
No. 8	—	—	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 1 1/2 inch, 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 one inch, 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 1" x No. 4 primary aggregate nominal size.

90-3.03 FINE AGGREGATE GRADING

- Fine aggregate shall be graded within the following limits:

Sieve Sizes	Percentage Passing	
	Operating Range	Contract Compliance
3/8"	100	100
No. 4	95 - 100	93 - 100
No. 8	65 - 95	61 - 99
No. 16	X ±10	X ±13
No. 30	X ±9	X ±12
No. 50	X ±6	X ±9
No. 100	2 - 12	1 - 15
No. 200	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 No. 16 sieve and the total percentage passing the No. 30 sieve shall be between 10 and 40, and the difference between the percentage passing the No. 30 and No. 50 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.

- The combined aggregate grading, except when otherwise specified in these specifications or the special provisions, shall be either the 1 1/2 inch, maximum grading, or the 1 inch, maximum grading, at the option of the Contractor.

Grading Limits of Combined Aggregates

Sieve Sizes	Percentage Passing			
	1 1/2" Max.	1" Max.	1/2" Max.	3/8" Max.
2"	100	—	—	—
1 1/2"	90 - 100	100	—	—
1"	50 - 86	90 - 100	—	—
3/4"	45 - 75	55 - 100	100	—
1/2"	—	—	90 - 100	100
3/8"	38 - 55	45 - 75	55 - 86	50 - 100
No. 4	30 - 45	35 - 60	45 - 63	45 - 63
No. 8	23 - 38	27 - 45	35 - 49	35 - 49
No. 16	17 - 33	20 - 35	25 - 37	25 - 37
No. 30	10 - 22	12 - 25	15 - 25	15 - 25
No. 50	4 - 10	5 - 15	5 - 15	5 - 15
No. 100	1 - 6	1 - 8	1 - 8	1 - 8
No. 200	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 weight of admixture, as determined by California Test 415, shall not be used.
- 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.
- Chemical admixtures shall be used in conformance with the manufacturer's written recommendations.

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.
- If 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.

90-4.04 REQUIRED USE OF CHEMICAL ADMIXTURES

- If the use of a chemical admixture 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.

90-4.05 OPTIONAL USE OF CHEMICAL ADMIXTURES

- The Contractor may 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. If a water-reducing admixture or a water-reducing and retarding admixture is used, the cementitious material content specified or ordered may be reduced by a maximum of 5 percent by weight, except that the resultant cementitious material content shall be not less than 505 pounds per cubic yard; 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.

90-4.08 BLANK

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, unless it is demonstrated that a different sequence improves performance.

- 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 one-half gallon per cubic yard 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."

90-4.11 BLANK

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 the various sizes shall not become intermixed before proportioning.

- Aggregates shall be stored or stockpiled and handled in a manner that 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 supplementary cementitious material for one batch of concrete is a single operation of a switch or starter.

- Proportioning devices shall be tested 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 weight of each batch of material shall not vary from the weight designated by the Engineer by more than the tolerances specified herein.

- Equipment for cumulative weighing of aggregate shall have a zero tolerance of ± 0.5 percent of the designated total batch weight of the aggregate. For systems with individual weigh hoppers for the various sizes of aggregate, the zero tolerance shall be ± 0.5 percent of the individual batch weight designated for each size of aggregate. Equipment for cumulative weighing of cement and supplementary cementitious material shall have a zero tolerance of ± 0.5 percent of the designated total batch weight of the cement and supplementary cementitious material. Equipment for weighing cement or supplementary cementitious material separately shall have a zero tolerance of ± 0.5 percent of their designated individual batch weights. Equipment for measuring water shall have a zero tolerance of ± 0.5 percent of its designated weight or volume.

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

- A. Aggregate weighed cumulatively shall be within 1.0 percent of the designated total batch weight of the aggregate. Aggregates weighed individually shall be within 1.5 percent of their respective designated batch weights; and
- B. Cement shall be 99 to 102 percent of its designated batch weight. When weighed individually, supplementary cementitious material shall be 99 to 102 percent of its designated batch weight. When supplementary cementitious material and cement are permitted to be weighed cumulatively, cement shall be weighed first to 99 to 102 percent of its designated batch weight, and the total for cement and supplementary cementitious material shall be 99 to 102 percent of the sum of their designated batch weights; and
- C. Water shall be within 1.5 percent of its designated weight or volume.

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

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 cementitious material and water as provided in these specifications. Aggregates shall be proportioned by weight.

- 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 weight.

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

- Bulk Type IP (MS) 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 supplementary cementitious material 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 supplementary cementitious material are weighed cumulatively, the cement shall be weighed first.
 - If cement and supplementary cementitious material are weighed in separate weigh hoppers, the weigh systems for the proportioning of the aggregate, the cement, and the supplementary cementitious material 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 supplementary cementitious material shall be discharged into the mixer simultaneously with the aggregate.
 - The scales and weigh hoppers for bulk weighing cement, supplementary cementitious material, or cement plus supplementary cementitious material shall be separate and distinct from the aggregate weighing equipment.
 - For batches of one cubic yard 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 weights, the gross weight and tare weight of batch trucks, truck mixers, truck agitators, and non-agitating hauling equipment shall be determined when ordered by the Engineer. The equipment shall be weighed on scales designated by the Engineer.

90-5.03A PROPORTIONING FOR PAVEMENT

- Aggregates and bulk supplementary cementitious material for use in pavement shall be proportioned by weight 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 weight of the fine aggregate.
 - The batching of cement, supplementary cementitious material, or cement plus supplementary cementitious material 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 supplementary cementitious material hoppers or the cement plus supplementary cementitious material hopper are charged with weights that are within the tolerances specified in Section 90-5.02, "Proportioning Devices."
 - If interlocks are required for cement and supplementary cementitious material charging mechanisms and cement and supplementary cementitious material are weighed cumulatively, their charging mechanisms shall be interlocked to prevent the introduction of mineral admixture until the weight of cement in the cement weigh hopper is within the tolerances specified in Section 90-5.02, "Proportioning Devices."
 - If concrete is completely mixed in stationary paving mixers, the supplementary cementitious materials shall be weighed in a separate weigh hopper and the supplementary cementitious material and cement shall be introduced simultaneously into the mixer proportionately with the aggregate. If the Contractor provides certification that the stationary mixer is capable of mixing the cement, supplementary cementitious material, aggregates, and water uniformly before discharge, weighing the supplementary cementitious material cumulatively with the cement is permitted. 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 before discharge that are required to produce a mix that meets the requirements above.

- The discharge gate on the cement and supplementary cementitious material hoppers or the cement plus supplementary cementitious material hopper shall be designed to permit regulating the flow of cement, supplementary cementitious material, or cement plus supplementary cementitious material into the aggregate as directed by the Engineer.
- If 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.
- If 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 1/3 cubic yard 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 cementitious material.
- 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 1/2-inch. 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 170 pounds per cubic yard of concrete.

Average Slump	Maximum Permissible Difference
Less than 4"	1"
4" to 6"	1 1/2"
Greater than 6" to 9"	2"

- The Contractor 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 50° F or more than 90° F. 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 150° F. 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 job site 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 job site 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 nonagitating 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 will 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 nonagitating 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 75° F.
 - 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.
 - If 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 if the temperature of the concrete is 85° F or above, the time allowed may be less than 1.5 hours. If an admixture is used to retard the set time, the temperature of the concrete shall not exceed 85° F, the time limit shall be 2 hours, and the revolution limitation shall be 300.
 - If nonagitating hauling equipment is used for transporting concrete to the delivery point, discharge shall be completed within one hour after the addition of the cement to the aggregates. Under conditions contributing to quick stiffening of the concrete, or when the temperature of the concrete is 85° F or above, the time between the introduction of cement to the aggregates and discharge shall not exceed 45 minutes.

- Each load of concrete delivered at the job site shall be accompanied by a weighmaster certificate showing the mix identification number, nonrepeating 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 weights (pounds) for the ingredients batched. Theoretical or target batch weights shall not be used as a substitute for actual scale weights.
- 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 3 1/2-inch 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 weights or measurements for a load of concrete provided that both certificates are imprinted with the same nonrepeating 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."
- When a high range water-reducing admixture is added to the concrete at the job site, the total number of revolutions shall not exceed 300.

90-6.05 HAND-MIXING

- Hand-mixed concrete shall be made in batches of not more than 1/3 cubic yard and shall be mixed on a watertight, level platform. The proper amount of coarse aggregate shall be measured in measuring boxes and spread on the platform and the fine aggregate shall be spread on this layer, the 2 layers being not more than one foot in total depth. On this mixture shall be spread the dry cementitious materials 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. If Type F or Type G chemical admixtures are added to the mix, the penetration requirements shall not apply and the slump shall not exceed 9 inches after the chemical admixtures are added.

Type of Work	Nominal		Maximum	
	Penetration (inches)	Slump (inches)	Penetration (inches)	Slump (inches)
Concrete Pavement	0 - 1	—	1 1/2	—
Non-reinforced concrete facilities	0 - 1 1/2	—	2	—
Reinforced concrete structures				
Sections over 12 inches thick	0 - 1 1/2	—	2 1/2	—
Sections 12 inches thick or less	0 - 2	—	3	—
Concrete placed under water	—	6 - 8	—	9
Cast-in-place concrete piles	2 1/2 - 3 1/2	5 - 7	4	8

- The amount of free water used in concrete shall not exceed 310 pounds per cubic yard, plus 20 pounds for each required 100 pounds of cementitious material in excess of 550 pounds per cubic yard.
- 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.
- If 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 yard of concrete. The increase in water and cementitious material shall be at a ratio not to exceed 30 pounds of water per added 100 pounds of cementitious material per cubic yard. Full compensation for additional cementitious material and water added under these conditions shall be considered as included in the contract price paid for the concrete work involved 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.
- Cotton mats, rugs, carpets, or earth or sand blankets may be used as a curing medium to retain the moisture during the curing period.
- If a curing medium consisting of cotton mats, rugs, carpets, polyethylene sheeting, polyethylene sheeting on burlap, 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 media.
- At the option of the Contractor, a curing medium consisting of white opaque polyethylene sheeting extruded onto burlap may be used to cure concrete structures. The polyethylene sheeting shall have a minimum thickness of 4-mil, and shall be extruded onto 10-ounce burlap.
- At the option of the Contractor, a curing medium consisting of polyethylene sheeting may be used to cure concrete columns. The polyethylene sheeting shall have a minimum thickness of 10-mil achieved in a single layer of material.
- If the Contractor chooses to use polyethylene sheeting or polyethylene sheeting on burlap as a curing medium, these media and any joints therein shall be secured as necessary to provide moisture retention and shall be within 3 inches of the concrete at all points along the surface being cured. When these media are used, the temperature of the concrete shall be monitored during curing. If the temperature of the concrete cannot be maintained below 140° F, use of these curing media shall be disallowed.
- 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 above, 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. Nonpigmented curing compound conforming to the requirements in ASTM Designation: C 309, Type 1, Class B.
 5. Nonpigmented curing compound conforming to the requirements in ASTM Designation: C 309, Type 1, Class A.
 6. Nonpigmented 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 0.28-pounds per square yard in 24 hours.
 - The curing compound to be used will be specified elsewhere in these specifications or in the special provisions.
 - If 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 one gallon per 150 square feet, unless otherwise specified.
 - At any point, the application rate shall be within ± 50 square feet per gallon of the nominal rate specified, and the average application rate shall be within ± 25 square feet per gallon 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 40° F and shall not be diluted or altered after manufacture.

- The curing compound shall be packaged in clean 274-gallon totes, 55-gallon barrels or 5-gallon 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 274-gallon totes and the 55-gallon barrels shall have removable lids and airtight fasteners. The 5-gallon pails shall be round and have standard full open head and bail. Lids with bungholes will 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.

- 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.

- 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, at the job site, 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 0.33-foot.

- 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 20 inches 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 60° F, 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 50° F, steam shall be applied during the presteaming period to hold the air surrounding the member at a temperature between 50° F and 90° F.
 - 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 40° F per hour. The curing temperature throughout the enclosure shall not exceed 150° F 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 200 feet 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 60° F 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 in a corrosive environment 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," 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, 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, 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. If required by the Engineer, the Contractor shall submit a written outline of the proposed methods for protecting the concrete.
 - The Contractor shall protect concrete from damage from any cause, which shall include, but not be limited to: rain, heat, cold, wind, Contractor's actions, and actions of others.
 - 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 45° F for 72 hours after placing and at not less than 40° F for an additional 4 days.

90-8.03 PROTECTING CONCRETE PAVEMENT

- Pavement concrete shall be maintained at a temperature of not less than 40° F for 72 hours.
- 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.
 - If 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 550 pounds per square inch. 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 550 pounds per square inch. Concrete that fails to attain a modulus of rupture of 550 pounds per square inch 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 350 pounds per square inch has been attained, provided that:
 - A. Unit pressure exerted on the pavement by the paver shall not exceed 20 pounds per square inch;
 - 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 one foot 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.
 - 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 make corrective changes, subject to approval of the Engineer, in the mix proportions or in the concrete fabrication procedures, before placing additional concrete, and shall pay to the State \$10 for each in-place cubic yard of concrete represented by the deficient test. If the result of a single compressive strength test at the maximum age specified or allowed is below 95 percent of the specified strength, but is 85 percent or more of the specified strength, the Contractor shall make the corrective changes specified above, and shall pay to the State \$15 for each in-place cubic yard of concrete represented by the deficient test. In addition, such corrective changes shall be made when the compressive strength of concrete tested at 7 days indicates, in the judgment of the Engineer, that the concrete will not attain the required compressive strength at the maximum age specified or allowed. 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 320 cubic yards.

- If 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. If 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 580 pounds per square inch greater than the specified 28-day compressive strength, and no individual cylinder shall have a strength less than the specified strength at the maximum age specified or allowed. Data contained in the report shall be from trial batches 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 yards and the weight, type, and source of all ingredients used.

- D. Penetration or slump (if the concrete will be placed under water or placed in cast-in-place concrete piles) 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.
- Use of crushed concrete or reclaimed aggregate is acceptable only if the aggregate satisfies all aggregate requirements.
 - 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 1 1/2-inch or smaller than 3/4-inch.
 - 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 90° F 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.

- When a high range water-reducing admixture is added to the concrete at the job site, the total number of revolutions shall not exceed 300.

- 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 40° F 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.

- For concrete measured at the mixer, the volume in cubic feet shall be computed as the total weight of the batch in pounds divided by the density of the concrete in pounds per cubic foot. The total weight 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.

SECTION 91: PAINT

Issue Date: May 1, 2006

Section 91-3, "Paints for Timber," of the Standard Specifications is amended to read:

91-3 PAINTS FOR TIMBER

91-3.01 WOOD PRIMER, LATEX-BASE

Classification:

- This specification covers a ready-mixed priming paint for use on unpainted wood or exterior woodwork. It shall conform with the requirements in the Detailed Performance Standards of the Master Painters Institute (MPI) for exterior wood primers, and be listed on the Exterior Latex Wood Primer MPI List Number 6.

91-3.02 PAINT; LATEX-BASE FOR EXTERIOR WOOD, WHITE AND TINTS

Classification:

- This specification covers a ready-mixed paint for use on wood surfaces subject to outside exposures. This paint shall conform to the requirements in the Detailed Performance Standards of the Master Painters Institute (MPI) for Paint, Latex, Exterior, and shall be listed on the following MPI Approved Products List:

- A. Exterior Latex, Flat MPI Gloss Level 1, MPI List Number 10.
- B. Exterior Latex, Semi-Gloss, MPI Gloss Level 5, MPI List Number 11.
- C. Exterior Latex, Gloss, MPI Gloss Level 6, MPI List Number 119.

- Unpainted wood shall first be primed with wood primer conforming to the provisions in Section 91-3.01, "Wood Primer, Latex-Base."

Section 91-4, "Miscellaneous Paints," of the Standard Specifications is amended to read:

91-4 MISCELLANEOUS PAINTS

91-4.01 THROUGH 91-4.04 (BLANK)

91-4.05 PAINT; ACRYLIC EMULSION, EXTERIOR WHITE AND LIGHT AND MEDIUM TINTS

Classification:

- This specification covers an acrylic emulsion paint designed for use on exterior masonry. This paint shall conform to the requirements in the Detailed Performance Standards of the Master Painters Institute (MPI) for Paint, Latex, Exterior, and shall be listed on the following MPI Approved Products Lists:

- A. Exterior Latex, Flat MPI Gloss Level 1, MPI List Number 10.
- B. Exterior Latex, Semi-Gloss, MPI Gloss Level 5, MPI List Number 11.
- C. Exterior Latex, Gloss, MPI Gloss Level 6, MPI List Number 119.

- This paint may be tinted by using "universal" or "all purpose" concentrates.

SECTION 92: ASPHALTS

Issue Date: February 2, 2007

Section 92, "Asphalts," of the Standard Specifications is amended to read:

92-1.01 DESCRIPTION

- Asphalt is refined petroleum or a mixture of refined liquid asphalt and refined solid asphalt that are prepared from crude petroleum. Asphalt is:

1. Free from residues caused by the artificial distillation of coal, coal tar, or paraffin
2. Free from water
3. Homogeneous

92-1.02 MATERIALS

GENERAL

- Furnish asphalt under the Department's "Certification Program for Suppliers of Asphalt." The Department maintains the program requirements, procedures, and a list of approved suppliers at:

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

- Transport, store, use, and dispose of asphalt safely.
- Prevent the formation of carbonized particles caused by overheating asphalt during manufacturing or construction.

GRADES

- Performance graded (PG) asphalt binder is:

Performance Graded Asphalt Binder

Property	AASHTO Test Method	Specification				
		Grade				
		PG 58-22 ^a	PG 64-10	PG 64-16	PG 64-28	PG 70-10
Original Binder						
Flash Point, Minimum °C	T 48	230	230	230	230	230
Solubility, Minimum % ^b	T 44	99	99	99	99	99
Viscosity at 135°C, ^c Maximum, Pa·s	T 316	3.0	3.0	3.0	3.0	3.0
Dynamic Shear, Test Temp. at 10 rad/s, °C Minimum G*/sin(delta), kPa	T 315	58 1.00	64 1.00	64 1.00	64 1.00	70 1.00
RTFO Test, ^e Mass Loss, Maximum, %	T 240	1.00	1.00	1.00	1.00	1.00
RTFO Test Aged Binder						
Dynamic Shear, Test Temp. at 10 rad/s, °C Minimum G*/sin(delta), kPa	T 315	58 2.20	64 2.20	64 2.20	64 2.20	70 2.20
Ductility at 25°C Minimum, cm	T 51	75	75	75	75	75
PAV ^f Aging, Temperature, °C	R 28	100	100	100	100	110
RTFO Test and PAV Aged Binder						
Dynamic Shear, Test Temp. at 10 rad/s, °C Maximum G*/sin(delta), kPa	T 315	22 ^d 5000	31 ^d 5000	28 ^d 5000	22 ^d 5000	34 ^d 5000
Creep Stiffness, Test Temperature, °C Maximum S-value, Mpa Minimum M-value	T 313	-12 300 0.300	0 300 0.300	-6 300 0.300	-18 300 0.300	0 300 0.300

Notes:

- a. Use as asphalt rubber base stock for high mountain and high desert area.
 - b. The Engineer waives this specification if the supplier is a Quality Supplier as defined by the Department's "Certification Program for Suppliers of Asphalt."
 - c. The Engineer waives this specification if the supplier certifies the asphalt binder can be adequately pumped and mixed at temperatures meeting applicable safety standards.
 - d. Test the sample at 3°C higher if it fails at the specified test temperature. G*/sin(delta) remains 5000 kPa maximum.
 - e. "RTFO Test" means the asphaltic residue obtained using the Rolling Thin Film Oven Test, AASHTO Test Method T 240 or ASTM Designation: D 2872. The residue from mass change determination may be used for other tests.
 - f. "PAV" means Pressurized Aging Vessel.
- Performance graded polymer modified asphalt binder (PG Polymer Modified) is:

Performance Graded Polymer Modified Asphalt Binder ^a

Property	AASHTO Test Method	Specification Grade		
		PG 58-34 PM	PG 64-28 PM	PG 76-22 PM
Original Binder				
Flash Point, Minimum °C	T 48	230	230	230
Solubility, Minimum % ^b	T 44 ^c	98.5	98.5	98.5
Viscosity at 135°C, ^d Maximum, Pa·s	T 316	3.0	3.0	3.0
Dynamic Shear, Test Temp. at 10 rad/s, °C Minimum G*/sin(delta), kPa	T 315	58 1.00	64 1.00	76 1.00
RTFO Test , Mass Loss, Maximum, %	T 240	1.00	1.00	1.00
RTFO Test Aged Binder				
Dynamic Shear, Test Temp. at 10 rad/s, °C Minimum G*/sin(delta), kPa	T 315	58 2.20	64 2.20	76 2.20
Dynamic Shear, Test Temp. at 10 rad/s, °C Maximum (delta), %	T 315	Note e 80	Note e 80	Note e 80
Elastic Recovery ^f , Test Temp., °C Minimum recovery, %	T 301	25 75	25 75	25 65
PAV ^g Aging, Temperature, °C	R 28	100	100	110
RTFO Test and PAV Aged Binder				
Dynamic Shear, Test Temp. at 10 rad/s, °C Maximum G*sin(delta), kPa	T 315	16 5000	22 5000	31 5000
Creep Stiffness, Test Temperature, °C Maximum S-value, MPa Minimum M-value	T 313	-24 300 0.300	-18 300 0.300	-12 300 0.300

Notes:

- a. Do not modify PG Polymer Modified using acid modification.
- b. The Engineer waives this specification if the supplier is a Quality Supplier as defined by the Department's "Certification Program for Suppliers of Asphalt."
- c. The Department allows ASTM D 5546 instead of AASHTO T 44
- d. The Engineer waives this specification if the supplier certifies the asphalt binder can be adequately pumped and mixed at temperatures meeting applicable safety standards.
- e. Test temperature is the temperature at which G*/sin(delta) is 2.2 kPa. A graph of log G*/sin(delta) plotted against temperature may be used to determine the test temperature when G*/sin(delta) is 2.2 kPa. A graph of (delta) versus temperature may be used to determine delta at the temperature when G*/sin(delta) is 2.2 kPa. The Engineer also accepts direct measurement of (delta) at the temperature when G*/sin(delta) is 2.2 kPa.
- f. Tests without a force ductility clamp may be performed.
- g. "PAV" means Pressurized Aging Vessel.

SAMPLING

- Provide a sampling device in the asphalt feed line connecting the plant storage tanks to the asphalt weighing system or spray bar. Make the sampling device accessible between 24 and 30 inches above the platform. Provide a receptacle for flushing the sampling device.
 - Include with the sampling device a valve:
 1. Between 1/2 and 3/4 inch in diameter
 2. Manufactured in a manner that a one-quart sample may be taken slowly at any time during plant operations
 3. Maintained in good condition
 - Replace failed valves.
 - In the Engineer's presence, take 2 one-quart samples per operating day. Provide round, friction top, one-quart containers for storing samples.

92-1.03 EXECUTION

- If asphalt is applied, you must comply with the heating and application specifications for liquid asphalt in Section 93, "Liquid Asphalts."

92-1.04 MEASUREMENT

- If the contract work item for asphalt is paid by weight, the Department measures asphalt tons by complying with the specifications for weight determination of liquid asphalt in Section 93, "Liquid Asphalts."
 - The Engineer determines the asphalt weight from volumetric measurements if you:
 1. Use a partial asphalt load
 2. Use asphalt at a location other than a mixing plant and no scales within 20 miles are available and suitable
 3. Deliver asphalt in either of the following:
 - 3.1. A calibrated truck with each tank accompanied by its measuring stick and calibration card
 - 3.2. A truck equipped with a calibrated thermometer that determines the asphalt temperature at the delivery time and with a vehicle tank meter complying with the specifications for weighing, measuring, and metering devices in Section 9-1.01, "Measurement of Quantities"
 - If you furnish asphalt concrete from a mixing plant producing material for only one project, the Engineer determines the asphalt quantity by measuring the volume in the tank at the project's start and end provided the tank is calibrated and equipped with its measuring stick and calibration card.
 - The Engineer determines pay quantities from volumetric measurements as follows:
 1. Before converting the volume to weight, the Engineer reduces the measured volume to that which the asphalt would occupy at 60 °F.
 2. The Engineer uses 235 gallons per ton and 8.51 pounds per gallon for the average weight and volume for PG and PG Polymer Modified asphalt grades at 60 °F.
 3. The Engineer uses the Conversion Table in Section 93, "Liquid Asphalts."

SECTION 93: LIQUID ASPHALTS

Issue Date: November 3, 2006

The ninth paragraph of Section 93-1.04, "Measurement," of the Standard Specifications is amended to read:

- The following Legend and Conversion Table is to be used for converting volumes of liquid asphalt products, Grades 70 to 3000, inclusive, and paving asphalt Grades PG 58-22, PG 64-10, PG 64-16, PG 64-28, and PG 70-10, and Grades PG 58-34 PM, PG 64-28 PM, and PG 76-22 PM.

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.

The bidder shall complete the "List of Subcontractors" form in the Proposal and Contract book, listing the name, address, and portion of work to be performed by each subcontractor listed. 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, the bidder shall list on this form each first tier Disabled Veteran Business Enterprise subcontractor to be used for credit in meeting the goal. A first tier subcontractor is one to whom the bidder proposes to directly subcontract portions of the work.

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, P.O. Box 911, Marysville, CA 95901, Attn: NRCO/Contract Administration Engineer, so that the request is received by the Department by close of business on the fourth business day 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.

Failure of the bidder to fulfill the requirements of the Special Provisions for submittals required to be furnished after bid opening, (including but not limited to DVBE submittals, and escrowed bid documents or prequalification materials when required), may subject the bidder to a determination of the bidder's responsibility in the event it is the apparent low bidder on any subsequent public works contracts.

2-1.02 DISABLED VETERAN BUSINESS ENTERPRISE (DVBE)

It is the policy of the Department that Disabled Veteran Business Enterprises (DVBEs) shall be provided the opportunity for full participation in the performance of contracts financed solely with state funds. The Contractor shall take all necessary and reasonable steps to ensure that DVBEs have such opportunity to participate in the performance of this contract. The Contractor shall not discriminate on the basis of race, color, national origin, or sex in the award and performance of subcontracts.

It is the bidder's responsibility to make a sufficient portion of the work available to subcontractors and suppliers and to select those portions of the work or material needs consistent with the available DVBE subcontractors and suppliers, so as to assure meeting the goal for DVBE participation or to provide information to establish that, prior to bidding, the bidder made good faith efforts to do so.

Section 999, et seq., of the Military and Veterans Code sets forth requirements for DVBE participation goals, summarized as follows:

- A. "Disabled Veteran Business Enterprise" (DVBE) means a business concern certified as a DVBE by the Office of Small Business and DVBE Services, Department of General Services.
- B. DVBEs must be certified on the date bids for the project are opened before credit may be allowed toward the DVBE goal. It is the Contractor's responsibility to verify that DVBEs are certified.
- C. The disabled veteran business owner must be domiciled in the State of California.
- D. A DVBE may participate as a prime contractor, as a subcontractor, as a joint venture partner with a prime or subcontractor, or as a vendor of material or supplies.
- E. The DVBE must perform a commercially useful function, that is, be responsible for the execution of a distinct element of the work and carry out its responsibility by actually performing, managing, or supervising the work. An extra participant will not be considered to perform a commercially useful function.
- F. Credit for DVBE prime contractors will be 100 percent of the contract price.
- G. Credit for participation of a DVBE subcontractor, supplier, or broker will be 100 percent provided such DVBE is performing a commercially useful function.
- H. A DVBE broker shall submit the required declarations and federal tax returns at the time of performance.

Failure to carry out the requirements of Section 999, et seq., of the Military and Veterans Code shall constitute a material breach of this contract and may result in termination of the contract or other remedy the Department deems appropriate.

A DVBE joint venture partner must be responsible for specific contract items of work, or portions thereof. The DVBE joint venture partner must share in the ownership, control, management responsibilities, risks, and profits of the joint venture. The DVBE joint venture must submit the joint venture agreement with the Caltrans Bidder DVBE Information form required in Section 2-1.02B, "Submission of DVBE Information," elsewhere in these special provisions.

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

2-1.02A DVBE GOAL FOR THIS PROJECT

The Disabled Veteran Business Enterprise (DVBE) participation goal for this project: 3 percent.

The Office of Small Business and DVBE Services, Department of General Services, is located at 707 Third Street, West Sacramento, CA 95605. It may be contacted at (800) 559-5529 or (916) 375-4940 or its internet web site at <http://www.pd.dgs.ca.gov/smbus/default.htm> for program information.

2-1.02B SUBMISSION OF DVBE INFORMATION

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

If the DVBE information is not submitted with the bid, the apparent successful bidder (low bidder), the second low bidder and the third low bidder shall submit the DVBE information to the following address: Department of Transportation, MS 43, Attn: Office Engineer, 1727 30th Street, Sacramento, California 95816 so the information is received by the Department no later than 4:00 p.m. on the fourth business day following bid opening. Failure to submit the required DVBE information by the time specified will be grounds for finding the bid or proposal nonresponsive. Other bidders need not submit DVBE information unless requested to do so by the Department.

The bidder's DVBE information shall establish that either it met the goal or that, prior to bidding, it made good faith efforts to meet the goal. Information demonstrating that a good faith effort to meet the DVBE goal has been made by the bidder shall be submitted on the "DVBE INFORMATION GOOD FAITH EFFORTS" form included in the Proposal.

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

The bidder's DVBE information shall include the names of all DVBE firms that will participate, with a complete description of work or supplies to be provided by each and the dollar value of each DVBE transaction. When 100 percent of a contract item of work is not to be performed or furnished by a DVBE, a description of the exact portion of that work to be performed or furnished by that DVBE shall be included in the DVBE information, including the planned location of that work.

A bidder shall be deemed to have made good faith efforts if, within the time specified by the Department, it submits documentary evidence that all of the following actions were taken:

- A. Contact was made with the Office of Small Business and DVBE Services, Department of General Services or their web site at <http://www.pd.dgs.ca.gov/smbus/default.htm> to identify Disabled Veteran Business Enterprises.
- B. Advertising was published in trade media and media focusing on Disabled Veteran Business Enterprises, unless time limits imposed by the Department do not permit that advertising.
- C. Invitations to bid were submitted to potential Disabled Veteran Business Enterprise contractors.
- D. Available Disabled Veteran Business Enterprises were considered.

2-1.03 SMALL BUSINESS AND NON-SMALL BUSINESS SUBCONTRACTOR PREFERENCES

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

Bidders, subcontractors, and suppliers who wish to be certified as Small Businesses under the provisions of those laws and regulations, shall be certified as Small Business by the Office of Small Business and DVBE Services, Department of General Services, 707 Third Street, West Sacramento, CA 95605.

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

2-1.03A SMALL BUSINESS PREFERENCE

To request Small Business Preference, bidders shall fill out and sign the "Request for Small Business Preference and Non-Small Business Subcontractor Preference" form in the Proposal and shall attach a copy of their Office of Small Business and DVBE Services Small Business Certification letter to the form. The bidder's signature on the "Request for Small Business Preference" certifies that the bidder is certified as a Small Business at the time and day of bid opening or has applied for certification and is subsequently certified by the Department of General Services.

2-1.03B NON-SMALL BUSINESS SUBCONTRACTOR PREFERENCE

To request Non-Small Business Subcontractor Preference, bidders shall fill out and sign the "Request for Small Business Preference and Non-Small Business Subcontractor Preference" form in the Proposal. The bidder's signature certifies that the bidder commits to subcontract at least 25 percent of its bid amount with one or more subcontractors or suppliers that are certified as Small Businesses.

The bidder shall also fill out the "CALTRANS BIDDER – SMALL BUSINESS SUBCONTRACTOR - INFORMATION" form. If the Small Business Subcontractor information is not submitted with the bid, the form shall be removed from the documents and submitted in the same time and manner specified for DVBE Information in "Submission of DVBE Information" of these special provisions. The bidder shall attach a copy of the Office of Small Business and DVBE Services small business certification letter for each listed subcontractor or supplier, to the form. The listed subcontractors and suppliers shall be certified as Small Business at the time and day of bid opening or have applied for certification and are subsequently certified by the Department of General Services. Each listed subcontractor or supplier shall be designated to perform a commercially useful function.

2-1.04 CALIFORNIA COMPANY PREFERENCE

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

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

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

- A. Has its principal place of business in California.
- B. Has its principal place of business in a state in which there is no local contractor preference on construction contracts.
- C. Has its principal place of business in a state in which there is a local contractor construction preference and the Contractor has paid not less than \$5000 in sales or use taxes to California for construction related activity for each of the five years immediately preceding the submission of the bid.

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

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

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

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.

Requests for relief of bid and bid protests are to be delivered to the following address: Department of Transportation, MS 43, Attn: Office Engineer, 1727 30th Street, Sacramento, CA 95816 or by facsimile to the Office Engineer at (916) 227-6282.

The award of the contract, if made, will be to the lowest responsible bidder whose proposal complies with all the requirements prescribed and who has met the goal for DVBE participation or has demonstrated, to the satisfaction of the Department, good faith efforts to do so.

The contract shall be executed by the successful bidder and shall be returned, together with the contract bonds and the documents identified in Section 3-1.025, "Insurance Policies," of the Standard Specifications, to the Department so that it is received within 10 business days 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, contract bonds and the documents identified in Section 3-1.025, "Insurance Policies," of the Standard Specifications. 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 20 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.

Attention is also directed to "Small Business and Non-Small Business Subcontractor Preferences" of these special provisions.

A bidder who is certified as a Small Business by the Office of Small Business and DVBE Services, Department of General Services, will be allowed a preference in the award of this contract under the following conditions:

- A. The bidder filled out and signed the "Request for Small Business Preference and Non-Small Business Subcontractor Preference" form, requesting Small Business preference, and attached a copy of its Office of Small Business and DVBE Services small business certification letter to the form; and
- B. The apparent low bidder is not certified as a Small Business.

A bidder who is not certified as a Small Business by the Office of Small Business and DVBE Services, Department of General Services, will be allowed a preference in the award of this contract under the following conditions:

- A. The bidder filled out and signed the "Request for Small Business Preference and Non-Small Business Subcontractor Preference" form, requesting Non-Small Business Subcontractor preference and notifying the Department that it commits to subcontract at least 25 percent of its bid amount with one or more Small Businesses, and submitted the "CALTRANS BIDDER – SMALL BUSINESS SUBCONTRACTOR – INFORMATION" form listing the subcontractors and suppliers it commits to subcontract with; and
- B. The apparent low bidder is not certified as a Small Business, and has not filled out and signed the "Request for Small Business Preference and Non-Small Business Subcontractor Preference."

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

The Non-Small Business Subcontractor preference will be a reduction in the bid submitted by the Non-Small Business contractor requesting the preference, for bid comparison purposes, by an amount equal to 5 percent of the amount bid by the apparent low bidder, the amount not to exceed \$50,000. If this reduction results in the Non-Small Business contractor requesting the preference becoming the low bidder, or in a precise tie with a Non-Small Business apparent low bidder not requesting the preference, then the contract will be awarded to the Non-Small Business contractor requesting the preference on the basis of its actual bid notwithstanding the reduced bid price used for bid comparison purposes. Application of the Non-Small Business Subcontractor preference shall not result in the displacement of a Small Business in winning the award.

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

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

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

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

DVBE bidders shall have precedence over Non-DVBE bidders in that in the event the application of the Small Business preference to more than one bidder results in a precise tie in the bid amounts used for comparison purposes, the award shall go to the DVBE that is also a small business. This precedence shall not apply to the application of the California company reciprocal preference.

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

The first working day is the fifteenth day after contract approval.

The work shall be diligently prosecuted to completion before the expiration of **105 WORKING DAYS**.

The Contractor shall pay to the State of California the sum of \$12,500 per day, for each day's delay in finishing the work in excess of the number of working days specified above.

SECTION 5. GENERAL

SECTION 5-1. MISCELLANEOUS

5-1.01 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.

5-1.017 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.

5-1.018 GUARANTEE

GENERAL

The Contractor shall guarantee the work is in accordance with contract requirements and remains free from substantial defects in materials and workmanship for a period of one year after contract acceptance. For certain portions of the work where the Director relieves the Contractor of responsibility in accordance with Section 7-1.15, "Relief from Maintenance and Responsibility," of the Standard Specifications, the guarantee period starts on the relief date and ends one year thereafter.

Substantial defects in materials and workmanship means defective work objectively manifested by damaged, displaced, or missing parts or components and workmanship resulting in improper function of materials, components, equipment, or systems, as installed or manufactured by the Contractor, subcontractor, supplier, or manufacturer.

During the guarantee period, the Contractor shall repair or replace contract work and associated work which is not in accordance with contract requirements or has substantial defects in materials and workmanship. The Contractor shall perform the corrective work with no expense to the Department other than State-provided field inspection services.

The guarantee of work excludes damage or displacement that is outside the control of the Contractor and caused by normal wear and tear, improper operation, insufficient maintenance, abuse, unauthorized modification, or natural disaster as described in Section 7-1.165, "Damage by Storm, Flood, Tsunami or Earthquake," of the Standard Specifications.

The Contractor shall have the same insurance coverage during corrective work operations as prior to contract acceptance, in accordance with Section 7-1.12, "Indemnification and Insurance," of the Standard Specifications.

The contract bonds furnished in accordance with Section 3-1.02, "Contract Bonds," of the Standard Specifications must remain in full force and effect during the guarantee period and until all corrective work is complete.

In the case of conflict between this guarantee provision and any warranty provision included in the contract, the warranty provision shall govern for the specific construction product or feature covered.

CORRECTIVE WORK

During the guarantee period, the Department will monitor performance of the highway facilities completed by the Contractor and will perform a thorough review of the contract work at least 60 days before the expiration of the one-year guarantee.

If the Engineer discovers contract work not in compliance with contract requirements or that has substantial defects in materials and workmanship, at any time during the guarantee period, a list of items that require corrective work will be developed and forwarded to the Contractor. Within 15 days of receipt of a list, the Contractor shall submit to the Engineer a detailed plan for performing corrective work. The work plan shall include a start to finish schedule. It shall include a list of labor, equipment, materials, and any special services intended to be used. It shall clearly show related work including traffic control, temporary delineation, and permanent delineation.

The Contractor shall start the corrective and related work within 15 days of receiving notice from the Engineer that the Contractor's work plan is approved. The corrective work shall be diligently prosecuted and completed within the time allotted in the approved work plan.

If the Engineer determines that corrective work, covered by the guarantee, is urgently needed to prevent injury or property damage, the Engineer will give the Contractor a request to start emergency repair work and a list of items that require repair work. The Contractor shall mobilize within 24 hours and diligently perform emergency repair work on the damaged highway facilities. The Contractor shall submit a work plan within 5 days of starting emergency repair work.

If the Contractor fails to commence and execute, with due diligence, corrective work and related work required under the guarantee in the time allotted, the Engineer may proceed to have the work performed by State forces or other forces at the Contractor's expense. Upon demand, the Contractor shall pay all costs incurred by the Department for work performed by State forces or other forces including labor, equipment, material, and special services.

PAYMENT

Full compensation for performing corrective work; and related work such as traffic control, temporary delineation, and permanent delineation, and to maintain insurance coverage and bonds, shall be considered as included in the contract prices paid for the various contract items of work and no separate payment will be made therefor.

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 \$5,000 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 12 feet 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 one foot deep.
 - 3. Trenches less than one foot wide for irrigation pipe or electrical conduit, or excavations less than one foot 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 4:1 (horizontal:vertical).
 - 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 12 feet 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 15 feet from the edge of the traffic lane open to public traffic. The temporary railing shall be installed on a skew toward the edge of the traffic lane of not more than one foot transversely to 10 feet longitudinally with respect to the edge of the traffic lane. If the 15-foot minimum offset cannot be achieved, the temporary railing shall be installed on the 10 to 1 skew to obtain the maximum available offset between the approach end of the railing and the edge of the traffic lane, and an array of temporary crash cushion modules shall be installed at the approach end of the temporary railing.

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) (Miles Per Hour)	Work Areas
Over 45	Within 6 feet of a traffic lane but not on a traffic lane
35 to 45	Within 3 feet of a traffic lane but not on a traffic lane

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

When traffic cones or delineators are used to delineate a temporary edge of 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 10 feet without written approval from the Engineer.

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

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

Full compensation for conforming to the 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.

5-1.065 SOLID WASTE DISPOSAL AND RECYCLING REPORT

This work shall consist of reporting disposal and recycling of construction solid waste, as specified in these special provisions. For the purposes of this section, solid waste includes construction and demolition waste debris, but not hazardous waste.

Annually by the fifteenth day of January, the Contractor shall complete and certify Form CEM-4401, "Solid Waste Disposal and Recycling Report," which quantifies solid waste generated by the work performed and disposed of in landfills or recycled during the previous calendar year. The amount and type of solid waste disposed of or recycled shall be reported in tons. The Contractor shall also complete and certify Form CEM-4401 within 5 days following contract acceptance.

Form CEM-4401, "Solid Waste Disposal and Recycling Report" can be downloaded at:

<http://www.dot.ca.gov/hq/construc/manual2001>

If the Contractor has not submitted Form CEM-4401, by the dates specified above, the Department will withhold the amount of \$10,000 for each missing or incomplete report. The moneys withheld will be released for payment on the next monthly estimate for partial payment following the date that a complete and acceptable Form CEM-4401 is submitted to the Engineer. Upon completion of all contract work and submittal of the final Form CEM-4401, remaining withheld funds associated with this section, "Solid Waste Disposal and Recycling Report," will be released for payment. Withheld funds in conformance with this section shall be in addition to other moneys withheld provided for in the contract. No interest will be due the Contractor on withheld amounts.

Full compensation for preparing and submitting Form CEM-4401, "Solid Waste Disposal and Recycling Report," shall be considered as included in the contract price for the various items of work involved and no additional compensation will be allowed therefor.

5-1.07 (BLANK)

5-1.08 (Blank)

5-1.09 SUBCONTRACTING

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

Pursuant to the provisions in 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>

Unauthorized substitution of a listed subcontractor may constitute a violation of the "Subletting and Subcontracting Fair Practices Act" and may subject the Contractor to the penalties imposed therein.

5-1.09A DVBE SUBCONTRACTING

The DVBEs listed by the Contractor in response to the provisions in Section 2-1.02B, "Submission of DVBE Information," and Section 3, "Award and Execution of Contract," of these special provisions, which are determined by the Department to be certified DVBEs, shall perform the work and supply the materials for which they are listed, unless the Contractor has received prior written authorization to perform the work with other forces or to obtain the materials from other sources.

Unauthorized substitution of a DVBE may also constitute a violation of California Code of Regulations Section 1896.64. The Contractor shall not be entitled to payment for the work or material unless it is performed or supplied by the listed DVBE or by other forces (including those of the Contractor) pursuant to prior written authorization of the Engineer.

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

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

The Contractor agrees that the awarding department will have the right to review, obtain and copy all records pertaining to performance of DVBEs during the contract. The Contractor agrees to provide the awarding department with any relevant information requested and shall permit access to its premises, upon reasonable notice, during normal business hours for the purpose of interviewing employees and inspecting and copying such books, records, accounts and other material that may be relevant to a matter under investigation for the purpose of determining compliance with Public Contract Code Section 10115 et seq. The Contractor further agrees to maintain such records for a period of three (3) years after final payment under the contract.

5-1.09B NON-SMALL BUSINESS SUBCONTRACTING

The Small Business subcontractors listed by the Contractor in response to the provisions in Section 2-1.03B, "Non-small Business Subcontractor Preference," and Section 3, "Award and Execution of Contract," of these special provisions, which are determined by the Department to be certified as Small Business, 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.

Unauthorized substitution of a Small Business subcontractor may also constitute a violation of California Code of Regulations Section 1896.10 and may subject the Contractor to the sanctions referenced therein.

The provisions in Section 2-1.03B, "Non-small Business Subcontractor Preference," of these special provisions that Small Business subcontractors shall be certified on the date bids are opened does not apply to substitutions after award of the contract.

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

The Contractor agrees that the awarding department will have the right to review, obtain and copy all records pertaining to performance of Small Businesses during the contract. The Contractor agrees to provide the awarding department with any relevant information requested and shall permit access to its premises, upon reasonable notice, during normal business hours for the purpose of interviewing employees and inspecting and copying such books, records, accounts and other material that may be relevant to a matter under investigation for the purpose of determining compliance with California Code of Regulations Section 1896, et seq. The Contractor further agrees to maintain such records for a period of three (3) years after final payment under 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 concerning prompt payment to subcontractors.

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 6 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.

5-1.104 INTERNET DAILY EXTRA WORK REPORT

When extra work is being paid for on a force account basis, the Contractor shall submit daily extra work reports in conformance with the provisions in Section 9-1.03C, "Records," of the Standard Specifications and these special provisions.

The Contractor shall send daily extra work reports to the Engineer using the Department's Internet extra work billing system. The reports shall conform to the requirements in the "iCAS User's Guide" (Guide). The Guide is available from the Department, and is also found at:

http://www.dot.ca.gov/hq/construc/ewb/EWB_INSTRUCTION.pdf

The Department will provide system accounts to the Contractor's authorized representatives when at least one of the representatives has received training. The Department will provide system training to at least one of the Contractor's authorized representatives within 30 days of the Contractor's request for training. The Department will assign an account and user identification to the Contractor's authorized representatives, and each Contractor's authorized representative shall maintain a unique password. A daily extra work report that the Contractor's authorized representative sends to the Department using the Internet extra work billing system will be considered signed by the Contractor. A daily extra work report that the Engineer approves using the Internet extra work billing system will be considered signed by the Engineer.

Daily extra work reports that include billing for materials shall be substantiated by a valid copy of a vendor's invoice in conformance to the requirements in Section 9-1.03C, "Records," of the Standard Specifications. Each materials invoice shall clearly identify the relative daily extra work report and the associated cost of the materials. In addition to postal service and parcel service and if approved by the Engineer, invoices may be sent by facsimile or as an electronic-mail attachment.

The Contractor shall maintain the Contractor's interface with the Department's Internet extra work billing system. If the Contractor is using the file transfer process to submit extra work reports, it shall conform to the file transfer format and process defined in the Guide.

5-1.105 ARCHAEOLOGICAL DISCOVERIES

If archaeological materials, including but not limited to human skeletal material and disarticulated human bone, are discovered at the job site, protect and leave undisturbed and in place archaeological materials in accordance with the following codes and these special provisions:

- 1. California Public Resources Code, Division 5, Chapter 1.7 § 5097.5
- 2. California Public Resources Code, Division 5, Chapter 1.75 § 5097.98 and § 5097.99
- 3. California Administrative Code, Title 14 § 4308

4. California Penal Code, Part 1, Title 14 § 622-1/2
5. California Health and Safety Code, Division 7, Part 1, Chapter 2, § 7050.5

Archaeological materials are the physical remains of past human activity and include historic-period archaeological materials and prehistoric Native American archaeological materials. Nonhuman fossils are not considered to be archaeological except when showing direct evidence of human use or alteration or when found in direct physical association with archaeological materials as described in these special provisions.

Historic-period archaeological materials include cultural remains beginning with initial European contact in California, but at least 50 years old. Historical archaeological materials include:

1. Trash deposits or clearly defined disposal pits containing tin cans, bottles, ceramic dishes, or other refuse indicating previous occupation or use of the site
2. Structural remains of stone, brick, concrete, wood, or other building material found above or below ground or
3. Human skeletal remains from the historic period, with or without coffins or caskets, including any associated grave goods

Prehistoric Native American archaeological materials include:

1. Human skeletal remains or associated burial goods such as beads or ornaments
2. Evidence of tool making or hunting such as arrowheads and associated chipping debris of fine-grained materials such as obsidian, chert, or basalt
3. Evidence of plant processing such as pestles, grinding slabs, or stone bowls
4. Evidence of habitation such as cooking pits, stone hearths, packed or burnt earth floors or
5. Remains from food processing such as concentrations of discarded or burnt animal bone, shellfish remains, or burnt rocks used in cooking

Immediately upon discovery of archaeological materials, stop all work within a 60-foot radius of the archaeological materials and immediately notify the Engineer. Archaeological materials found during construction are the property of the State. Do not resume work within the 60-foot radius of the find until the Engineer gives you written approval. If, in the opinion of the Engineer, completion of the work is delayed or interfered with by reason of an archeological find or investigation or recovery of archeological materials, you 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 Department may use other forces to investigate and recover archaeological materials from the location of the find. When ordered by the Engineer furnish labor, material, tools and equipment, to secure the location of the find, and assist in the investigation or recovery of archaeological materials and the cost will be paid for as extra work as provided in Section 4-1.03D, "Extra Work," of the Standard Specifications.

Full compensation for immediately notifying the Engineer upon discovery of archaeological materials and leaving undisturbed and in place archaeological materials discovered on the job site shall be considered as included in the contract price paid for various items of work involved and no additional compensation will be allowed therefor.

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:

<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 at:

SAVE International
60 Revere Drive
Northbrook, IL 60062
Telephone: (847) 480-1730
FAX: (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 RESOLUTION ADVISOR

A dispute resolution advisor, hereinafter referred to as "DRA", is chosen by the Department and the Contractor to assist in the resolution of disputes. The DRA is a part of the contract administrative claims 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. The DRA shall not serve as a substitute for filing a protest or a notice of potential claim.

The DRA shall be established by the Department and the Contractor within 30 days of contract approval.

The Department and the Contractor shall each choose the names of 3 potential DRA candidates. Each potential candidate shall provide the Department and the Contractor with their disclosure statement. The disclosure statement shall include a resume of the potential candidate's experience and a declaration statement describing past, present, anticipated, and planned relationships with all parties involved in this contract.

The Department and the Contractor shall select one of the 6 nominees to be the DRA. If the Department and the Contractor cannot agree on one candidate, the Department and the Contractor shall each choose one of the 3 nominated by the other. The final selection of the DRA will be decided by a coin toss between the two candidates.

The Department and the Contractor shall complete and adhere to the Dispute Resolution Advisor Agreement. No DRA meeting shall take place until the Dispute Resolution Advisor Agreement has been signed by all parties, unless all parties agree to sign it at the first meeting.

If DRA needs outside technical services, technical services shall be preapproved by both the Department and the Contractor.

DRA recommendations are nonbinding.

The Contractor shall not use the DRA for disputes between subcontractors or suppliers that have no grounds for a lawsuit against the Department.

DRA replacement is selected in the same manner as the original selection. The appointment of a replacement DRA will begin promptly upon determination of the need for replacement. The Dispute Resolution Advisor Agreement shall be amended to reflect the change of the DRA.

Failure of the Contractor to help in choosing a DRA will result in the withhold of 25 percent of the estimated value of all work performed during each estimate period that the Contractor fails to comply. DRA withholds will be released for payment on the next monthly progress payment following the date that the Contractor has provided assistance in choosing the DRA and no interest will be due the Contractor.

The State and the Contractor shall bear the costs and expenses of the DRA equally.

The DRA shall be compensated at an agreed rate of \$1,500 per day for time spent per meeting either at the start of the project or for a dispute. A member serving on more than one State DRA or Dispute Review Board, regardless the number of meetings per day shall not be paid more than the agreed rate per day. The agreed rate 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 DRA is at an authorized DRA meeting.

No additional compensation will be made for time spent by the DRA to review and research activities outside the official DRA meetings unless that time, such as time spent evaluating and preparing recommendations on specific issues presented to the DRA, 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 Department and the Contractor will be compensated at an agreed rate of \$150 per hour. The agreed amount of \$150 per hour shall include all incidentals including expenses for telephone, fax, and computer services.

The State will provide conference facilities for DRA meetings at no cost to the Contractor.

The Contractor shall make direct payments to the DRA for participation in authorized meetings and approved hourly rate charges from invoices submitted.

The State will reimburse the Contractor for the State's share of the costs.

There will be no markups applied to expenses associated with the DRA, either by the DRA or by the Contractor when requesting payment of the State's share of DRA expenses. Regardless of the DRA recommendation, neither party will be entitled to reimbursement of DRA costs from the other party.

The Contractor shall submit extra work bills and include invoices with original supporting documents for reimbursement of the State's share.

The cost of technical services will be borne equally by the State and Contractor. There will be no markups for these costs.

A copy of the "Dispute Resolution Advisor Agreement" to be executed by the Contractor, State and the DRA is as follows:

Form XXXX Rev (07-01-05)

DISPUTE RESOLUTION ADVISOR AGREEMENT

(Contract Identification)

Contract No. _____

THIS DISPUTE RESOLUTION ADVISOR 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 Resolution Advisor, hereinafter called the "DRA." .

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 DRA to assist in resolving disputes; and

WHEREAS, the DRA is composed of one person, chosen by the CONTRACTOR and the STATE;

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 DRA hereto agree as follows:

SECTION I DESCRIPTION OF WORK

To assist in the timely resolution of disputes between the parties, the contract provides for the establishment and the operation of the DRA. The DRA is to fairly and impartially consider disputes placed before it and provide recommendations for resolution of these disputes to the parties. The DRA shall provide recommendations based on the facts related to the dispute, the contract and applicable laws and regulations. The DRA shall perform the services necessary to participate in the DRA's actions as designated in Section III, Scope of Work.

SECTION II DRA QUALIFICATIONS

DRA shall be knowledgeable in the type of construction and contract documents anticipated by the contract and shall have completed training through the Dispute Review Board Foundation. In addition, it is desirable for the DRA to have served on several State Dispute Review Boards (DRB).

No DRA shall have prior direct involvement in this contract. No DRA shall have a financial interest in this contract or parties thereto, including but not limited to the CONTRACTOR, subcontractors, suppliers, consultants, and legal and business services, within a period 6 months prior to award and during this contract. Exceptions to above are compensation for services on this or other DRAs and DRBs or retirement payments or pensions received from a party that are not tied to, dependent on or affected by the net worth of the party.

DRA shall fully disclose all direct or indirect professional or personal relationships with all key members of the contract.

SECTION III SCOPE OF WORK

The Scope of Work of the DRA includes, but is not limited to, the following:

A. PROCEDURES

The DRA shall meet with the parties at the start of the project to establish procedures 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. The DRA established procedures shall only be implemented upon approval by the parties. Subsequent meetings shall be held only to hear disputes between the parties.

The DRA shall not meet with, or discuss contract issues with individual parties.

State shall provide the DRA with the contract and all written correspondence regarding the dispute between the parties and, if available, the Contractor's supplemental notice of potential claim, and the Engineer's response to the supplemental notice of potential claim.

The parties shall not call the DRA who served on this contract as a witness in arbitration proceedings, which may arise from this contract.

The DRA shall have no claim against the STATE or the CONTRACTOR, or both, from claimed harm arising out of the parties' evaluations of the DRA's opinions.

B. DISPUTE MEETING

The term "dispute meeting" as used in this subsection shall refer to both the informal and traditional dispute meeting processes, unless otherwise noted.

If the CONTRACTOR requests a dispute meeting with the DRA, the Contractor must simultaneously notify the STATE. Upon being notified of the need for a dispute meeting, the DRA shall review and consider the dispute. The DRA shall determine the time and location of the dispute meeting with due consideration for the needs and preferences of the parties, while recognizing the importance of a speedy resolution to the dispute.

Dispute meetings shall be conducted at any location that would be convenient and provide required facilities and access to necessary documentation.

Only the STATE's Resident Engineer or Area Construction Engineer and the CONTRACTOR's or subcontractor's, if the dispute involves a subcontractor, Superintendent or Project Manager may present information at a dispute meeting. 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. The exception to this is technical services, as described below:

The DRA, with approval of the parties, 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 two parties as specified in an approved contract change order. The CONTRACTOR shall not be entitled to markups for the payments made for these services.

At the dispute meeting the DRA may ask questions, seek clarification, and request further clarification of data presented by either of the parties as may be necessary to assist in making a fully informed recommendation. However, the DRA shall refrain from expressing opinions on the merits of statements on matters under dispute during the parties' presentations. Each party will be given ample time to fully present its position, make rebuttals, provide relevant documents, and respond to DRA questions and requests.

There shall be no testimony under oath or cross-examination, during DRA dispute meetings. 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 DRA in conformance with the rules and regulations established at the first meeting between the DRA and parties. These established rules and regulations need not comply with prescribed legal laws of evidence.

Failure to attend a dispute meeting by either of the parties shall be conclusively considered by the DRA as indication that the non-attending party considers all written documents and correspondence submitted 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 at the meeting until all aspects of the dispute are thoroughly covered.

1. TRADITIONAL DISPUTE MEETING:

The following procedure shall be used for the traditional dispute meeting:

- a. Within 5 days, after receiving the STATE's written response to the CONTRACTOR's supplemental notice of potential claim, the CONTRACTOR shall refer the dispute to the DRA, if the CONTRACTOR wishes to further pursue the dispute. The CONTRACTOR shall make the referral in writing to the DRA, simultaneously copied to the STATE. The written dispute referral shall describe the disputed matter in individual discrete segments, so that it will be clear to both parties and the DRA 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.
- b. The parties shall each be afforded an opportunity to be present and to be heard by the DRA, and to offer evidence. Either party furnishing written evidence or documentation to the DRA must furnish copies of such information to the other party a minimum of 10 days prior to the date the DRA is scheduled to convene the meeting for the dispute. Either party shall produce such additional evidence as the DRA 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 DRA. The DRA shall not consider evidence not furnished in conformance with the terms specified herein.
- c. Upon receipt by the DRA of a written referral of a dispute, the DRA shall convene to review and consider the dispute. The dispute meeting shall be held no later than 25 days after receipt of the written referral unless otherwise agreed to by all parties.
- d. The DRA shall furnish a written report to both parties. The DRA may request clarifying information of either party within 5 days after the DRA dispute meeting. Requested information shall be submitted to the DRA within 5 days of the DRA request. The DRA shall complete its report and submit it to the parties within 10 days of the DRA dispute meeting, except that time extensions may be granted at the request of the DRA with the written concurrence of both parties. The report shall summarize the facts considered, the contract language, law or regulation viewed by the DRA as pertinent to the dispute, and the DRA's interpretation and philosophy in arriving at its conclusions and recommendations and, if appropriate, recommends guidelines for determining compensation. The DRA's written opinion shall stand on its own, without attachments or appendices.
- e. Within 10 days after receiving the DRA's report, both parties shall respond to the DRA 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 DRA'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 DRA recommendation. Immediately after responses have been received from both parties, the DRA shall provide copies of both responses to the parties simultaneously. Either party may request clarification of elements of the DRA's report from the DRA prior to responding to the report. The DRA shall consider any clarification request only if submitted within 5 days of receipt of the DRA's report, and if submitted simultaneously in writing to both the DRA and the other party. Each party may submit only one request for clarification for any individual DRA report. The DRA shall respond, in writing, to requests for clarification within 5 days of receipt of such requests.
- f. Either party may seek a reconsideration of the DRA's recommendation. The DRA shall only grant reconsideration based upon submission of new evidence and if the request is submitted within the 10 day time limit specified for response to the DRA's written report. Each party may submit only one request for reconsideration regarding an individual DRA recommendation.

- g. If the parties are able to settle their dispute with the aid of the DRA's report, the STATE and CONTRACTOR shall promptly accept and implement the settlement of the parties. If the parties cannot agree on compensation within 30 days of the acceptance by both parties of the settlement, either party may request the DRA to make a recommendation regarding compensation.

2. INFORMAL DISPUTE MEETING

An informal dispute meeting shall be convened, only if, the parties and the DRA agree that this dispute resolution process is appropriate to settle the dispute.

The following procedure shall be used for the informal dispute meeting:

- a. The parties shall furnish the DRA with one copy of pertinent documents requested by the DRA that are or may become necessary for the DRA to perform its function. The party furnishing documents shall furnish such documents to the other party at the same time the document is provided to the DRA.
- b. After the dispute meeting has concluded; the DRA shall deliberate in private the same day, until a response to the parties is reached or as otherwise agreed to by the parties.
- c. The DRA then verbally delivers its recommendation with findings to the parties.
- d. After the recommendation is presented, the parties may ask for clarifications.
- e. Occasionally the DRA on complex issues may be unable to formulate a recommendation based on the information given at a dispute meeting. However, the DRA may provide the parties with advice on strengths and weaknesses of their prospective positions, in the hope of the parties reaching settlement.
- f. If the parties are able to settle their dispute with the aid of the DRA's opinion, the STATE and CONTRACTOR shall promptly accept and implement the settlement of the parties.
- g. The DRA will not be bound by its oral recommendation in the event that a dispute is later heard by the DRA in a traditional dispute meeting.

Unless the dispute is settled, use of the informal dispute meeting does not relieve the parties of their responsibilities under Section 5-1.12, "Dispute Resolution Advisor," of the Special Provisions or Subsection, "Traditional Dispute Meeting," of this AGREEMENT. There will be no extension of time allowed for the process to permit the use of the informal dispute meeting, unless otherwise agreed to by the parties.

SECTION IV TIME FOR BEGINNING AND COMPLETION

Once established, the DRA shall be in operation until the day the Director accepts the contract. The DRA shall not begin work under the terms of this AGREEMENT until authorized in writing by the STATE or as agreed to by the parties.

SECTION V PAYMENT

DRA shall be compensated at an agreed rate of \$1,500 per day for time spent per meeting, either at the start of the project or for a dispute. A member serving on more than one State DRA or DRB, regardless the number of meetings per day, shall not be paid more than the agreed rate per day. The agreed rate shall be considered full compensation for onsite time, travel expenses, transportation, lodging, time for travel and incidentals for each day, or portion thereof that the DRA is at an authorized DRA meeting. No additional compensation will be made for time spent by DRA to review and research activities outside the official DRA meetings unless that time, (such as time spent evaluating and preparing recommendations on specific issues presented to the DRA), has been specifically agreed to in advance by the parties. Time away from the project, which has been specifically agreed to in advance by the parties, will be compensated at an agreed rate of \$150 per hour. The agreed amount of \$150 per hour shall include all incidentals including expenses for telephone, fax, and computer services. The State will provide administrative services such as conference facilities to the DRA.

A. PAYMENT PROCESSING

CONTRACTOR shall make direct payments to DRA for their participation in authorized meetings and approved hourly charges, from invoices submitted by the DRA, and technical services.

DRA 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 DRA until the amount and extent of those fees are approved by the STATE and CONTRACTOR.

B. INSPECTION OF COSTS RECORDS

DRA 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 VI ASSIGNMENT OF TASKS OF WORK

DRA shall not assign the work of this AGREEMENT.

SECTION VII TERMINATION OF A DRA MEMBER

DRA may resign after providing not less than 15 days written notice of the resignation to the STATE and CONTRACTOR. The DRA may be terminated, by either party, for failing to fully comply at all times with all required employment or financial disclosure conditions of DRA membership in conformance with the terms of the contract and this AGREEMENT. Each party shall document the need for replacement and substantiate the replacement request in writing to the other party and the DRA.

SECTION VIII LEGAL RELATIONS

The parties hereto mutually understand and agree that the DRA in the performance of duties 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 DRA 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 DRA.

SECTION IX CONFIDENTIALITY

The parties hereto mutually understand and agree that all documents and records provided by the parties in reference to issues brought before the DRA, which documents and records are marked "Confidential - for use by the DRA only," shall be kept in confidence and used only for the purpose of resolution of subject disputes, and for assisting in development of DRA 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 this AGREEMENT. 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 DRA. 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 X DISPUTES

Disputes between the parties hereto, including disputes between the DRA 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 XI VENUE, APPLICABLE LAW, AND PERSONAL JURISDICTION

In the event that any party, including the DRA, 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 XII FEDERAL REVIEW AND REQUIREMENTS

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

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

SECTION XIII CERTIFICATION OF CONTRACTOR, DRA, AND STATE

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

DRA

By: _____

Title: _____

CONTRACTOR

CALIFORNIA STATE DEPARTMENT
OF TRANSPORTATION

By: _____

By: _____

Title: _____

Title: _____

5-1.11 FORCE ACCOUNT PAYMENT

Payment for extra work at force account will be determined by either non-subcontracted or subcontracted force account payment unless otherwise specified.

Non-Subcontracted Force Account Payment

When extra work to be paid for on a force account basis is performed by the Contractor, compensation will be determined in accordance with Section 9-1.03, "Force Account Payment," of the Standard Specifications and these special provisions.

The second, third and fourth paragraphs of Section 9-1.03A, "Work Performed by Contractor," of 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 Section 9-1.03A(1), "Labor," Section 9-1.03A(2), "Materials," and Section 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 Section 9-1.03A(1), "Labor," Section 9-1.03A(2), "Materials," and Section 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.

Subcontracted Force Account Payment

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, compensation will be determined in accordance with the provisions in Section 9-1.03, "Force Account Payment," of the Standard Specifications.

5-1.12 COMPENSATION ADJUSTMENTS FOR PRICE INDEX FLUCTUATIONS

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

ITEM CODE	ITEM
390102	ASPHALT CONCRETE (TYPE A)
374002	ASPHALTIC EMULSION (FOG SEAL COAT)
390127	RUBBERIZED ASPHALT CONCRETE (TYPE O)

The compensation payable for paving asphalt used in asphalt concrete 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 is included in a monthly estimate:

- A. Total monthly adjustment = AQ
- B. For an increase in paving asphalt price index exceeding 10 percent:

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

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

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

- D. Where:

A = Adjustment in dollars per ton of paving asphalt used to produce asphalt concrete and asphaltic emulsion residue used as paint binder 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 tons 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.

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 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.

The California Statewide Paving Asphalt Price Index is available on the Division of Engineering Services website at:

http://www.dot.ca.gov/hq/esc/oe/asphalt_index/astable.html

5-1.13 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.

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

5-1.14 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. Lead Compliance Plan | \$2,000 |
| B. Progress Schedule (Critical Path Method) | \$4,000 |

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. Railing
- B. Pavement Markers

5-1.15 PROJECT INFORMATION

The information in this section has been compiled specifically for this project and is made available for bidders and Contractors. Other information referenced in the Standard Specifications and these special provisions do not appear in this section. The information is subject to the conditions and limitations set forth in Section 2-1.03, "Examination of Plans, Specifications, Contract, and Site of Work," and Section 6-2, "Local Materials," of the Standard Specifications. Bidders and Contractors shall be responsible for knowing the procedures for obtaining information.

Information included in the Information Handout provided to bidders and Contractors is as follows:

- A. Optional disposal site.

Cross sections are not available for this project.

SECTION 6. (BLANK)

SECTION 7. (BLANK)

SECTION 8. MATERIALS

SECTION 8-1. MISCELLANEOUS

8-1.01 PREQUALIFIED AND TESTED SIGNING AND DELINEATION MATERIALS

The Department maintains 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 (4" x 4")
- B. Avery Dennison, Models C88 (4" x 4"), 911 (4" x 4") and 953 (2.75" x 4.5")
- C. Ray-O-Lite, Model "AA" ARS (4" x 4")
- D. 3M Series 290 (3.5" x 4")
- E. 3M Series 290 PSA, with pressure sensitive adhesive pad (3.5" x 4")

Retroreflective With Abrasion Resistant Surface (ARS)

(for recessed applications only)

- A. Avery Dennison, Model 948 (2.3" x 4.7")
- B. Avery Dennison, Model 944SB (2" x 4")*
- C. Ray-O-Lite, Model 2002 (2.3" x 4.6")
- D. Ray-O-Lite, Model 2004 ARS (2" x 4")*

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

Non-Reflective, 4 inches Round

- A. Apex Universal (Ceramic)
- B. Apex Universal, Models 929 (ABS) and 929PP (Polypropylene)
- C. Glowlite, Inc. (Ceramic)
- D. Hi-Way Safety, Inc., Models P20-2000W and 2001Y (ABS)
- E. Interstate Sales, "Diamond Back" (Polypropylene)
- F. Novabrite Models Cdot (White) Cdot-y (Yellow), Ceramic
- G. Novabrite Models Pdot-w (White) Pdot-y (Yellow), Polypropylene
- H. Three D Traffic Works TD10000 (ABS), TD10500 (Polypropylene)

PAVEMENT MARKERS, TEMPORARY TYPE

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

- A. Vega Molded Products "Temporary Road Marker" (3" x 4")

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
- D. Glowlite, Inc., Model 932

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 Industries, 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 Industries, 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"
- C. Ennis Paint Inc., "Flametape"

Ceramic Surfacing Laminate, 6" x 6"

- A. Highway Ceramics, Inc.

CLASS 1 DELINEATORS

One Piece Driveable Flexible Type, 66 inches

- 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

Special Use Type, 66 inches

- A. Bunzl Extrusion, Model FG 560 (with 18 inches U-Channel base)
- B. Carsonite, "Survivor" (with 18 inches U-Channel base)
- C. Carsonite, Roadmarker CRM-375 (with 18 inches U-Channel base)
- D. FlexStake, Model 604
- E. GreenLine Models HWDU and CGD (with 18 inches U-Channel base)
- F. Impact Recovery Model D36, with #105 Driveable Base
- G. Safe-Hit with 8 inches pavement anchor (SH248-GP1)
- H. Safe-Hit with 15 inches soil anchor (SH248-GP2) and with 18 inches soil anchor (SH248-GP3)

Surface Mount Type, 48 inches

- 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" ID No. 522248W

CHANNELIZERS

Surface Mount Type, 36 inches

- A. Bent Manufacturing Company, Masterflex Models MF-360-36 (Round) and MF-180-36 (Flat)
- B. Bunzl Extrusion, Flexi-Guide Models FG300PE 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. Three D Traffic Works "Channelflex" ID 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, 42 inches

(For 28 inch 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"
- F. Three D Traffic Works "Ringtop" TD7000, ID No. 742143

OBJECT MARKERS

Type "K", 18 inches

- 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

Type "K-4" / "Q" Object Markers, 24 inches

- 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, ID 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. Three D Traffic Works "Roadguide" Model TD 9304

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
- D. Plastic Vacuum Forming, "Cap-It C400"

METAL BEAM GUARD RAIL POST MARKERS

(For use to the left of traffic)

- A. Bunzl Extrusion, "Mini" (3" x 10")
- B. Creative Building Products, "Dura-Bull, Model 11201"
- C. Duraflex Corp., "Railrider"
- D. Plastic Vacuum Forming, "Cap-It C300"

CONCRETE BARRIER DELINEATORS, 16 inches

(For use to the right of traffic)

- A. Bunzl Extrusion, Model PCBM T-16
- B. Safe-Hit, Model SH216RBM

CONCRETE BARRIER-MOUNTED MINI-DRUM (10 inches x 14 inches x 22 inches)

- A. Stinson Equipment Company "SaddleMarker"

SOUND WALL DELINEATOR

(Applied vertically. Place top of 3" x 12" reflective element at 48 inches above roadway)

- A. Bunzl Extrusion, PCBM S-36

GUARD RAILING DELINEATOR

(Place top of reflective element at 48 inches above plane of roadway)

Wood Post Type, 27 inches

- A. Bunzl Extrusion, FG 427 and FG 527
- B. Carsonite, Model 427
- C. FlexStake, Model 102 GR
- D. GreenLine GRD 27
- E. Safe-Hit, Model SH227GRD
- F. Three D Traffic Works "Guardflex" TD9100

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 (For rigid substrate devices only)
- B. Avery Dennison WR-6100 Series
- C. Nippon Carbide Industries, 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, 13 inches Sleeves

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

Traffic Cones, 4 inch x 6 inch Sleeves

- A. Nippon Carbide Industries, Flexible Ultralite Grade (ULG) II
- B. Reflexite, Vinyl, "TR" (Semi-transparent) or "Conformalight"
- C. 3M Series 3840
- D. Avery Dennison S-9000C

Barrels and Drums

- A. Avery Dennison WR-6100
- B. Nippon Carbide Industries, 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 and T-5500A Series
- B. Nippon Carbide Industries, Nikkalite Brand Ultralite Grade II
- C. 3M Series 3870

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

- A. Avery Dennison, T-6500 Series
- B. Nippon Carbide Industries, Crystal Grade, 94000 Series
- C. Nippon Carbide Industries, Model No. 94847 Fluorescent Orange
- D. Nippon Carbide Industries, Model No. 94844 Fluorescent Yellow Green

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

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

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

- A. 3M LDP Series 3924 Fluorescent Orange
- B. 3M LDP Series 3970

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

- A. Avery Dennison, T-7500 Series
- B. Avery Dennison, T-7511 Fluorescent Yellow
- C. Avery Dennison, T-7513 Fluorescent Yellow Green
- D. Avery Dennison, W-7514 Fluorescent Orange
- E. Nippon Carbide Industries, Nikkalite Crystal Grade Series 92800
- F. Nippon Carbide Industries, Nikkalite Crystal Grade Model 92844 Fluorescent Yellow/Green
- G. Nippon Carbide Industries, Nikkalite Crystal Grade Model 92847 Fluorescent Orange

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

- A. 3M VIP Series 3981 Diamond Grade Fluorescent Yellow
- B. 3M VIP Series 3983 Diamond Grade Fluorescent Yellow/Green
- C. 3M VIP Series 3990 Diamond Grade

SPECIALTY SIGNS

- A. Hallmark Technologies, Inc., All Sign STOP Sign (All Plastic), 30 inches
- B. Reflexite "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" (0.5 inch for Post-Mounted CZ Signs, 48 inches or less)

Aluminum Composite

- A. Alcan Composites "Dibond Material, 0.08 inch" (for temporary construction signs only)
- B. Mitsubishi Chemical America, Alpolic 350 (for temporary construction signs only)

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 weight 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 weight, the amount of mineral admixture shall not be less than 15 percent by weight of the total amount of cementitious material to be used in the mix.
 - 2. When the calcium oxide content of a mineral admixture is greater than 2 percent by weight, 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 weight 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 weight 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 weight 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 weight 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 weight 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 weight 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 pounds per cubic yard, the total weight of cement and mineral admixture per cubic yard shall not exceed the specified maximum cementitious material content.

SECTION 8-3. (BLANK)

SECTION 9. (BLANK)

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 2 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, the 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:

STATE HIGHWAY FUNDS

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

HIGHWAY IMPROVEMENT

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

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

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

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

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.

Attention is directed to "Shoulder Backing" elsewhere in these special provisions, regarding portable delineators and C31 "Low shoulder" signs.

Asphalt concrete pavement that is cold planed shall have the asphalt concrete replaced at the end of each working shift to within 1.15 inches of the finished grade of existing adjacent traffic lanes, unless otherwise permitted by the Engineer.

Crossover conduits shall be placed under existing pavement by jacking methods by the Contractor.

Public traffic shall not travel on a cold planned surface for more than 7 calendar days.

Attention is directed to "Water Pollution Control" of these special provisions regarding the submittal and approval of the Water Pollution Control Program prior to performing work having potential to cause water pollution.

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.

The removal of existing pavement delineation shall be as required by the planned work and as directed by the Engineer. Pavement delineation removal shall be coordinated with new delineation so that lane lines are provided at all times on traveled ways open to public traffic.

Before obliterating any pavement delineation (traffic stripes, pavement markings, and pavement markers) that is to be replaced on the same alignment and location, as determined by the Engineer, the pavement delineation shall be referenced by the Contractor, with a sufficient number of control points to reestablish the alignment and location of the new pavement delineation. The references shall include the limits or changes in striping pattern, including one- and 2-way barrier lines, limit lines, crosswalks and other pavement markings. Full compensation for referencing existing pavement delineation shall be considered as included in the contract prices paid for new pavement delineation and no additional compensation will be allowed therefor.

Prior to applying asphalt emulsion (paint binder), the Contractor shall cover all manholes, valve and monument covers, grates, or other exposed facilities located within the area of application, using a plastic or oil resistant construction paper secured to the facility being covered by tape or adhesive. The covered facilities shall be referenced by the Contractor, with a sufficient number of control points to relocate the facilities after the surface layer of asphalt concrete has been placed. After completion of the paving operation, all covers shall be removed and disposed of in a manner satisfactory to the Engineer. Full compensation for covering manholes, valve and monument covers, grates, or other exposed facilities, referencing, and removing temporary cover shall be considered as included in the contract price paid per ton for asphalt concrete, and no additional compensation will be allowed therefor.

At the end of each working day if a difference in excess of 0.15 foot exists between the elevation of the existing pavement and the elevation of excavations within 5 feet left and 8 feet right of the traveled way, that is not separated from public traffic by temporary railing (Type K), 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 4:1 (horizontal:vertical) or flatter to the bottom of the excavation. 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 or barriers 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.

10-1.02 WATER POLLUTION CONTROL

GENERAL

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

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

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

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

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

The Contractor shall designate in writing a Water Pollution Control Manager (WPCM). The Contractor shall ensure that the WPCM is qualified to prepare and implement the WPCP.

The WPCM shall be:

1. Responsible for water pollution control work.
2. The primary contact for water pollution control work.
3. Have authority to mobilize crews to make immediate repairs to water pollution control practices.

The Contractor may designate one manager to prepare the WPCP and a different manager to implement the plan.

WATER POLLUTION CONTROL PROGRAM

The Contractor shall submit a Water Pollution Control Program (WPCP) to the Engineer for approval. The WPCP shall conform to the requirements in the Preparation Manual and these special provisions.

The WPCP shall include water pollution control practices:

A. For storm water and non-storm water from areas outside of the job site related to construction activities for this contract such as:

1. Staging areas.
2. Storage yards.
3. Access roads.

B. Appropriate for each season as described in "Implementation Requirements" of these special provisions.

The WPCP shall include a schedule that:

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

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

A. Fiber rolls

Within 7 days after contract approval, the Contractor shall submit 2 copies of the WPCP to the Engineer. The Contractor shall allow 15 days for the Engineer's review. If revisions are required, the Engineer will provide comments and specify the date that the review stopped. The Contractor shall revise and resubmit the WPCP within 7 days of receipt of the Engineer's comments. The Engineer's review will resume when the complete WPCP is resubmitted. When the Engineer approves the WPCP, the Contractor shall submit 3 copies of the approved WPCP to the Engineer. The Contractor may proceed with construction activities if the Engineer conditionally approves the WPCP while minor revisions are being completed. If the Engineer fails to complete the review within the time allowed and if, in the opinion of the Engineer, completion of the work is delayed or interfered with by reason of the Engineer's delay, the Contractor will be compensated for resulting losses, and an extension of time will be granted, as provided for in Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

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

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

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

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

IMPLEMENTATION REQUIREMENTS

The Contractor shall construct, inspect, maintain, remove, and dispose of the water pollution control practices.

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

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

Year-Round

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

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

Rainy Season

Soil stabilization and sediment control practices conforming to these special provisions shall be in place during the rainy season between October 15 and April 15.

INSPECTION AND MAINTENANCE

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

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

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

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

REPORTING REQUIREMENTS

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

- A. The date, time, location, nature of the operation, type of discharge; and the cause of the notice or order.
- B. The water pollution control practices used before the discharge, or before receiving the notice or order.
- C. The date of placement and type of additional or altered water pollution control practices placed after the discharge, or after receiving the notice or order.
- D. A maintenance schedule for affected water pollution control practices.

PAYMENT

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

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

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

Payments for prepare water pollution control program will be made as follows:

- A. After the WPCP has been approved by the Engineer, up to 75 percent of the contract item price for prepare water pollution control program will be included in the monthly progress 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 percentage of the contract item price for prepare water pollution control program will be made in conformance with the provisions in Section 9-1.07A, "Payment Prior to Proposed Final Estimate."

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

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

10-1.03 CONSTRUCTION SITE MANAGEMENT

Construction site management shall consist of controlling potential sources of water pollution before they come in contact with storm water systems or watercourses. The Contractor shall control material pollution and manage waste and non-storm water existing at the construction site by implementing effective handling, storage, use, and disposal practices.

Attention is directed to "Water Pollution Control" of these special provisions regarding the Contractor's appointment of a water pollution control manager (WPCM) for the project.

The Contractor shall train all employees and subcontractors regarding:

- A. Material pollution prevention and control;
- B. Waste management;
- C. Non-storm water management;
- D. Identifying and handling hazardous substances; and
- E. Potential dangers to humans and the environment from spills and leaks or exposure to toxic or hazardous substances.

Training shall take place before starting work on this project. New employees shall receive the complete training before starting work on this project. The Contractor shall have regular meetings to discuss and reinforce spill prevention and control; material delivery, storage, use, and disposal; waste management; and non-storm water management procedures.

Instructions for material and waste handling, storage, and spill reporting and cleanup shall be posted at all times in an open, conspicuous, and accessible location at the construction site.

Nonhazardous construction site waste and excess material shall be recycled when practical or disposed of in accordance with the provisions in Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications, unless otherwise specified.

Vehicles and equipment at the construction site shall be inspected by the WPCM on a frequent, predetermined schedule, and by the operator each day of use. Leaks shall be repaired immediately, or the vehicle or equipment shall be removed from the construction site.

SPILL PREVENTION AND CONTROL

The Contractor shall implement spill and leak prevention procedures when chemicals or hazardous substances are stored. Spills of petroleum products; substances listed under CFR Title 40, Parts 110, 117, and 302; and sanitary and septic waste shall be contained and cleaned up as soon as is safe.

Minor spills involve small quantities of oil, gasoline, paint, or other material that can be controlled by the first responder upon discovery of the spill. Cleanup of minor spills includes:

- A. Containing the spread of the spill,
- B. Recovering the spilled material using absorption,
- C. Cleaning the contaminated area, and
- D. Disposing of contaminated material promptly and properly.

Semi-significant spills are those that can be controlled by the first responder with the help of other personnel. Cleanup of semi-significant spills shall be immediate. Cleanup of semi-significant spills includes:

- A. Containing the spread of the spill;
- B. Recovering the spilled material using absorption if the spill occurs on paved or an impermeable surface;

- C. Containing the spill with an earthen dike and digging up contaminated soil for disposal if the spill occurs on dirt;
- D. Covering the spill with plastic or other material to prevent contaminating runoff if the spill occurs during precipitation; and
- E. Disposing of contaminated material promptly and properly.

Significant or hazardous spills are those that cannot be controlled by construction personnel. Notifications of these spills shall be immediate. The following steps shall be taken:

- A. Construction personnel shall not attempt to cleanup the spill until qualified staff have arrived;
- B. Notify the Engineer and follow up with a written report;
- C. Obtain the services of a spills contractor or hazardous material team immediately;
- D. Notify the local emergency response team by dialing 911 and county officials at the emergency phone numbers kept on the construction site;
- E. Notify the Governor's Office of Emergency Services Warning Center at (805) 852-7550;
- F. Notify the National Response Center at (800) 424-8802 regarding spills of Federal reportable quantities in conformance with CFR Title 40, Parts 110, 119, and 302;
- G. Notify other agencies as appropriate, including:
 - 1. Fire Department,
 - 2. Public Works Department,
 - 3. Coast Guard,
 - 4. Highway Patrol,
 - 5. City Police or County Sheriff Department,
 - 6. Department of Toxic Substances,
 - 7. California Division of Oil and Gas,
 - 8. Cal OSHA, or
 - 9. Regional Water Resources Control Board.

The WPCM shall oversee and enforce proper spill prevention and control measures. Minor, semi-significant, and significant spills shall be reported to the Contractor's WPCM who shall notify the Engineer immediately.

The Contractor shall prevent spills from entering storm water runoff before and during cleanup. Spills shall not be buried or washed with water.

The Contractor shall keep material or waste storage areas clean, well organized, and equipped with enough cleanup supplies for the material being stored. Plastic shall be placed under paving equipment when not in use to catch drips.

MATERIAL MANAGEMENT

Material shall be delivered, used, and stored for this contract in a manner that minimizes or eliminates discharge of material into the air, storm drain systems, or watercourses.

The Contractor shall implement the practices described in this section when taking delivery of, using, or storing the following materials:

- A. Hazardous chemicals including:
 - 1. Acids,
 - 2. Lime,
 - 3. Glues,
 - 4. Adhesives,
 - 5. Paints,
 - 6. Solvents, and
 - 7. Curing compounds;
- B. Soil stabilizers and binders;
- C. Fertilizers;
- D. Detergents;
- E. Plaster;
- F. Petroleum products including:

1. Fuel,
2. Oil, and
3. Grease;

- G. Asphalt components and concrete components; and
H. Pesticides and herbicides.

The Contractor shall supply the Material Safety Data Sheet to the Engineer for material used or stored. The Contractor shall keep an accurate inventory of material delivered and stored at the construction site.

Employees trained in emergency spill cleanup procedures shall be present when hazardous materials or chemicals are unloaded.

The Contractor shall use recycled or less hazardous products when practical.

Application of herbicides and pesticides shall be performed by a licensed applicator. The Contractor shall complete the Report of Chemical Spray forms when spraying herbicides or pesticides, and shall submit a copy to the Engineer before application.

Material Storage

The Contractor shall store liquids, petroleum products, and substances listed in CFR Title 40, Parts 110, 117, and 302 in containers or drums approved by the United States Environmental Protection Agency, and place them in secondary containment facilities.

Secondary containment facilities shall be impervious to the materials stored there for a minimum contact time of 72 hours.

Throughout the rainy season secondary containment facilities shall be covered during non-working days and when precipitation is predicted. Secondary containment facilities shall be adequately ventilated.

The Contractor shall keep the secondary containment facility free of accumulated rainwater or spills. After precipitation, or in the event of spills or leaks, accumulated liquid shall be collected and placed into drums within 24 hours. These liquids shall be handled as hazardous waste in accordance with the provisions in "Hazardous Waste" of these special provisions, unless testing determines them to be nonhazardous.

Incompatible materials, such as chlorine and ammonia, shall not be stored in the same secondary containment facility.

Materials shall be stored in the original containers with the original product labels maintained in legible condition. Damaged or illegible labels shall be replaced immediately.

The secondary containment facility shall have the capacity to contain precipitation from a 24-hour-long, 25-year storm; and 10 percent of the aggregate volume of all containers, or all of the volume of the largest container within the facility, whichever is greater.

The Contractor shall store bagged or boxed material on pallets. Throughout the rainy season, bagged or boxed material shall be protected from wind and rain during non-working days and when precipitation is predicted.

The Contractor shall provide sufficient separation between stored containers to allow for spill cleanup or emergency response access. Storage areas shall be kept clean, well organized, and equipped with cleanup supplies appropriate for the materials being stored.

The Contractor shall repair or replace perimeter controls, containment structures, covers, and liners as needed. Storage areas shall be inspected before and after precipitation, and at least weekly during other times.

Stockpile Management

The Contractor shall reduce or eliminate potential air and water pollution from stockpiled material including soil, paving material, or pressure treated wood. Stockpiles shall be located out of floodplains when possible, and at least 50 feet from concentrated flows of storm water, drainage courses, or inlets unless written approval is obtained from the Engineer.

The Contractor may discontinue adding or removing material for up to 21 days and a stockpile will still be considered active.

The Contractor shall protect active stockpiles with plastic or geotextile cover, soil stabilization measures, or with linear sediment barrier when precipitation is predicted. Active stockpiles of cold mix asphalt concrete shall be placed on an impervious surface and covered with plastic when precipitation is predicted.

The Contractor shall protect inactive soil stockpiles with a plastic or geotextile cover, or with soil stabilization measures at all times during the rainy season. A linear sediment barrier around the perimeter of the stockpile shall also be used. During the non-rainy season soil stockpiles shall be covered and protected with a linear sediment barrier when precipitation is predicted. The Contractor shall control wind erosion during dry weather as provided in Section 10, "Dust Control," of the Standard Specifications.

Stockpiles of portland cement concrete rubble, asphalt concrete, asphalt concrete rubble, aggregate base, or aggregate subbase shall be covered with plastic or geotextile, or protected with a linear sediment barrier at all times during the rainy season, and when precipitation is predicted during the non-rainy season.

Stockpiles of cold mix asphalt concrete shall be placed on and covered with impermeable material at all times during the rainy season, and when precipitation is predicted during the non-rainy season.

Stockpiles of pressure treated wood shall be covered with impermeable material and placed on pallets at all times during the rainy season, and when precipitation is predicted during the non-rainy season.

The Contractor shall repair or replace linear sediment barriers and covers as needed or as directed by the Engineer to keep them functioning properly. Sediment shall be removed when it accumulates to 1/3 of the linear sediment barrier height.

WASTE MANAGEMENT

Solid Waste

The Contractor shall not allow litter or debris to accumulate anywhere on the construction site, including storm drain grates, trash racks, and ditch lines. The Contractor shall pick up and remove trash and debris from the construction site at least once a week. The WPCM shall monitor solid waste storage and disposal procedures on the construction site. The Contractor shall provide enough dumpsters of sufficient size to contain the solid waste generated by the project. Dumpsters shall be emptied when refuse reaches the fill line. Dumpsters shall be watertight. The Contractor shall not wash out dumpsters on the construction site. The Contractor shall provide additional containers and more frequent pickup during the demolition phase of construction

Solid waste includes:

- A. Brick,
- B. Mortar,
- C. Timber,
- D. Metal scraps,
- E. Sawdust,
- F. Pipe,
- G. Electrical cuttings,
- H. Non-hazardous equipment parts,
- I. Styrofoam and other packaging materials,
- J. Vegetative material and plant containers from highway planting, and
- K. Litter and smoking material, including litter generated randomly by the public.

Trash receptacles shall be provided and used in the Contractor's yard, field trailers, and locations where workers gather for lunch and breaks.

Hazardous Waste

The Contractor shall implement hazardous waste management practices when waste is generated on the construction site from the following substances:

- A. Petroleum products,
- B. Asphalt products,
- C. Concrete curing compound,
- D. Pesticides,
- E. Acids,
- F. Paints,
- G. Stains,
- H. Solvents,
- I. Wood preservatives,
- J. Roofing tar, and
- K. Materials classified as hazardous by California Code of Regulations, Title 22, Division 4.5; or listed in CFR Title 40, Parts 110, 117, 261, or 302.

Nothing in these special provisions shall relieve the Contractor of the responsibility for compliance with Federal, State, and local laws regarding storage, handling, transportation, and disposal of hazardous wastes.

The WPCM shall oversee and enforce hazardous waste management practices. Production of hazardous materials and hazardous waste on the construction site shall be kept to a minimum. Perimeter controls, containment structures, covers, and liners shall be repaired or replaced when damaged.

The Contractor shall have a laboratory certified by the Department of Health Services (DHS) sample and test waste when hazardous material levels are unknown to determine safe methods for storage and disposal.

The Contractor shall segregate potentially hazardous waste from nonhazardous waste at the construction site. Hazardous waste shall be handled, stored, and disposed of as required in California Code of Regulations, Title 22, Division 4.5, Section 66262.34; and in CFR Title 49, Parts 261, 262, and 263.

The Contractor shall store hazardous waste in sealed containers constructed and labeled with the contents and date accumulated as required in California Code of Regulations, Title 22, Division 4.5; and in CFR Title 49, Parts 172, 173, 178, and 179. Hazardous waste containers shall be kept in temporary containment facilities conforming to the provisions in "Material Storage" of these special provisions.

There shall be adequate storage volume and containers shall be conveniently located for hazardous waste collection. Containers of hazardous waste shall not be overfilled and hazardous wastes shall not be mixed. Containers of dry waste that are not watertight shall be stored on pallets. The Contractor shall not allow potentially hazardous waste to accumulate on the ground. Hazardous waste shall be stored away from storm drains, watercourses, moving vehicles, and equipment.

The Contractor shall clean water based or oil based paint from brushes or equipment within a contained area and shall not contaminate soil, watercourses, or storm drain systems. Paints, thinners, solvents, residues, and sludges that cannot be recycled or reused shall be disposed of as hazardous waste. When thoroughly dry, latex paint and paint cans, used brushes, rags, absorbent materials, and drop cloths shall be disposed of as solid waste.

The Contractor shall dispose of hazardous waste within 90 days of being generated. Hazardous waste shall be disposed of by a licensed hazardous waste transporter using uniform hazardous waste manifest forms and taken to a Class I Disposal Site. A copy of the manifest shall be provided to the Engineer.

Contaminated Soil

The Contractor shall identify contaminated soil from spills or leaks by noticing discoloration, odors, or differences in soil properties. Soil with evidence of contamination shall be sampled and tested by a laboratory certified by DHS. If levels of contamination are found to be hazardous, the soil shall be handled and disposed of as hazardous waste.

The Contractor shall prevent the flow of water, including ground water, from mixing with contaminated soil by using one or a combination of the following measures:

- A. Berms,
- B. Cofferdams,
- C. Grout curtains,
- D. Freeze walls, or
- E. Concrete seal course.

If water mixes with contaminated soil and becomes contaminated, the water shall be sampled and tested by a laboratory certified by the DHS. If levels of contamination are found to be hazardous, the water shall be handled and disposed of as hazardous waste.

Concrete Waste

The Contractor shall implement practices to prevent the discharge of portland cement concrete or asphalt concrete waste into storm drain systems or watercourses.

Portland cement concrete or asphalt concrete waste shall be collected at the following locations and disposed of:

- A. Where concrete material, including grout, is used;
- B. Where concrete dust and debris result from demolition;
- C. Where sawcutting, coring, grinding, grooving, or hydro-concrete demolition of portland cement concrete or asphalt concrete creates a residue or slurry; or
- D. Where concrete trucks or other concrete-coated equipment is cleaned at the construction site.

Sanitary and Septic Waste

Wastewater from sanitary or septic systems shall not be discharged or buried within the Department right of way. The WPCM shall inspect sanitary or septic waste storage and monitor disposal procedures at least weekly. Sanitary facilities that discharge to the sanitary sewer system shall be properly connected and free from leaks.

The Contractor shall obtain written approval from the local health agency, city, county, and sewer district before discharging from a sanitary or septic system directly into a sanitary sewer system, and provide a copy to the Engineer. The Contractor shall comply with local health agency requirements when using an on-site disposal system.

Liquid Waste

The Contractor shall not allow construction site liquid waste, including the following, to enter storm drain systems or watercourses:

- A. Drilling slurries or fluids,
- B. Grease-free or oil-free wastewater or rinse water,
- C. Dredgings,
- D. Liquid waste running off a surface including wash or rinse water, or
- E. Other non-storm water liquids not covered by separate permits.

The Contractor shall hold liquid waste in structurally sound, leak proof containers such as:

- A. Sediment traps,
- B. Roll-off bins, or
- C. Portable tanks.

Liquid waste containers shall be of sufficient quantity and volume to prevent spills and leaks. The containers shall be stored at least 50 feet from storm drains, watercourses, moving vehicles, and equipment.

The Contractor shall remove and dispose of deposited solids from sediment traps as provided in "Solid Waste" of these special provisions, unless determined infeasible by the Engineer.

Liquid waste may require testing to determine hazardous material content before disposal.

Drilling fluids and residue shall be disposed of outside the highway right of way. If the Engineer determines that an appropriate location is available, fluids and residue exempt under California Code of Regulations, Title 23, Section 2511(g) may be dried by infiltration and evaporation in a leak proof container. The remaining solid waste may be disposed of as provided in "Solid Waste" of these special provisions.

NON-STORM WATER MANAGEMENT

Water Control and Conservation

The Contractor shall prevent erosion or the discharge of pollutants into storm drain systems or watercourses by managing the water used for construction operations. The Contractor shall obtain the Engineer's approval before washing anything on the construction site with water that could discharge into a storm drain system or watercourse. Discharges shall be reported to the Engineer immediately.

The Contractor shall implement water conservation practices when water is used on the construction site. Irrigation areas shall be inspected and watering schedules shall be adjusted to prevent erosion, excess watering, or runoff. The Contractor shall shut off the water source to broken lines, sprinklers, or valves, and they shall be repaired as soon as possible. When possible, water from waterline flushing shall be reused for landscape irrigation. Paved areas shall be swept and vacuumed, not washed with water.

Construction water runoff, including water from water line repair, shall be directed to areas to infiltrate into the ground and shall not be allowed to enter storm drain systems or watercourses. Spilled water shall not be allowed to escape water truck filling areas. When possible, the Contractor shall direct water from off-site sources around the construction site, or shall minimize contact with the construction site.

Illegal Connection and Discharge Detection and Reporting

The Contractor shall inspect the construction site and the site perimeter before beginning work for evidence of illegal connections, discharges, or dumping. Subsequently, the construction site and perimeter shall be inspected on a frequent, predetermined schedule.

The Contractor shall immediately notify the Engineer when illegal connections, discharges, or dumping are discovered. The Contractor shall take no further action unless directed by the Engineer. Unlabeled or unidentifiable material shall be assumed to be hazardous.

The Contractor shall look for the following evidence of illegal connections, discharges, or dumping:

- A. Debris or trash piles,
- B. Staining or discoloration on pavement or soils,
- C. Pungent odors coming from drainage systems,
- D. Discoloration or oily sheen on water,
- E. Stains or residue in ditches, channels or drain boxes,
- F. Abnormal water flow during dry weather,
- G. Excessive sediment deposits,

- H. Nonstandard drainage junction structures, or
- I. Broken concrete or other disturbances near junction structures.

Vehicle and Equipment Cleaning

The Contractor shall limit vehicle and equipment cleaning or washing on the construction site to that necessary to control vehicle tracking or hazardous waste. Vehicles and equipment shall not be cleaned on the construction site with soap, solvents, or steam until the Engineer has been notified. The resulting waste shall be contained and recycled, or disposed of as provided in "Liquid Waste" or "Hazardous Waste" of these special provisions, whichever is applicable. The Contractor shall not use diesel to clean vehicles or equipment, and shall minimize the use of solvents.

The Contractor shall clean or wash vehicles and equipment in a structure equipped with disposal facilities. If using a structure is not possible, vehicles and equipment shall be cleaned or washed in an outside area with the following characteristics:

- A. Located at least 50 feet from storm drainage systems or watercourses,
- B. Paved with asphalt concrete or portland cement concrete,
- C. Surrounded by a containment berm, and
- D. Equipped with a sump to collect and dispose of wash water.

When washing vehicles or equipment with water, the Contractor shall use as little water as possible. Hoses shall be equipped with a positive shutoff valve.

Wash racks shall discharge to a recycle system or to another system approved by the Engineer. Sumps shall be inspected regularly, and liquids and sediments shall be removed as needed.

Vehicle and Equipment Fueling and Maintenance

The Contractor shall fuel or perform maintenance on vehicles and equipment off the construction site whenever practical. When fueling or maintenance must be done at the construction site, the Contractor shall designate a site, or sites, and obtain approval from the Engineer before using. The fueling or maintenance site shall be protected from storm water, shall be on level ground, and shall be located at least 50 feet from drainage inlets or watercourses. The WPCM shall inspect the fueling or maintenance site regularly. Mobile fueling or maintenance shall be kept to a minimum.

The Contractor shall use containment berms or dikes around the fueling and maintenance area. Adequate amounts of absorbent spill cleanup material and spill kits shall be kept in the fueling and maintenance area and on fueling trucks. Spill cleanup material and kits shall be disposed of immediately after use. Drip pans or absorbent pads shall be used during fueling or maintenance unless performed over an impermeable surface.

Fueling or maintenance operations shall not be left unattended. Fueling nozzles shall be equipped with an automatic shutoff control. Vapor recovery fueling nozzles shall be used where required by the Air Quality Management District. Nozzles shall be secured upright when not in use. Fuel tanks shall not be topped-off.

The Contractor shall recycle or properly dispose of used batteries and tires.

Material and Equipment Used Over Water

Drip pans and absorbent pads shall be placed under vehicles or equipment used over water, and an adequate supply of spill cleanup material shall be kept with the vehicle or equipment. Drip pans or plastic sheeting shall be placed under vehicles or equipment on docks, barges, or other surfaces over water when the vehicle or equipment will be idle for more than one hour.

The Contractor shall provide watertight curbs or toe boards on barges, platforms, docks, or other surfaces over water to contain material, debris, and tools. Material shall be secured to prevent spills or discharge into water due to wind.

Structure Removal Over or Adjacent to Water

The Contractor shall not allow demolished material to enter storm water systems or watercourses. The Contractor shall use covers and platforms approved by the Engineer to collect debris. Attachments shall be used on equipment to catch debris on small demolition operations. Debris catching devices shall be emptied regularly and debris shall be handled as provided in "Waste Management" of these special provisions.

The WPCM shall inspect demolition sites within 50 feet of storm water systems or watercourses every day.

Paving, Sealing, Sawcutting, and Grinding Operations

The Contractor shall prevent the following material from entering storm drain systems or water courses:

- A. Cementitious material,
- B. Asphaltic material,
- C. Aggregate or screenings,
- D. Grinding or sawcutting residue,
- E. Pavement chunks, or
- F. Shoulder backing.

The Contractor shall cover drainage inlets and use linear sediment barriers to protect downhill watercourses until paving, sealing, sawcutting, or grinding operations are completed and excess material has been removed. Drainage inlets and manholes shall be covered during the application of seal coat, tack coat, slurry seal, or fog seal.

During the rainy season or when precipitation is predicted, paving, sawcutting, and grinding operations shall be limited to places where runoff can be captured. Seal coat, tack coat, slurry seal, or fog seal operations shall not begin if precipitation is predicted for the application or the curing period. The Contractor shall not excavate material from existing roadways during precipitation.

The Contractor shall vacuum up slurry from sawcutting operations immediately after the slurry is produced. Slurry shall not be allowed to run onto lanes open to public traffic or off the pavement.

The Contractor shall collect residue from portland cement concrete grinding operations with a vacuum attachment on the grinding machine. The residue shall not be left on the pavement or allowed to flow across the pavement.

Material excavated from existing roadways may be stockpiled as provided in "Stockpile Management" of these special provisions if approved by the Engineer. Asphalt concrete chunks used in embankment shall be placed above the water table and covered by at least one foot of material.

Substances used to coat asphalt trucks and equipment shall not contain soap, foaming agents, or toxic chemicals.

Thermoplastic Striping and Pavement Markers

Thermoplastic striping and preheating equipment shutoff valves shall work properly at all times when on the construction site. The Contractor shall not preheat, transfer, or load thermoplastic within 50 feet of drainage inlets or watercourses. The Contractor shall not fill the preheating container to more than 6 inches from the top. Truck beds shall be cleaned daily of scraps or melted thermoplastic.

The Contractor shall not unload, transfer, or load bituminous material for pavement markers within 50 feet of drainage inlets or watercourses. All pressure shall be released from melting tanks before removing the lid to fill or service. Melting tanks shall not be filled to more than 6 inches from the top.

The Contractor shall collect bituminous material from the roadway after marker removal.

Pile Driving

The Contractor shall keep spill kits and cleanup material at pile driving locations. Pile driving equipment shall be parked over drip pans, absorbent pads, or plastic sheeting where possible. When not in use, pile driving equipment shall be stored at least 50 feet from concentrated flows of storm water, drainage courses, or inlets. The Contractor shall protect pile driving equipment by parking it on plywood and covering it with plastic when precipitation is predicted. The WPCM shall inspect the pile driving area every day for leaks and spills.

The Contractor shall use vegetable oil instead of hydraulic fluid when practical.

Concrete Curing

The Contractor shall not overspray chemical curing compound. Drift shall be minimized by spraying as close to the concrete as possible. Drainage inlets shall be covered before applying curing compound.

The Contractor shall minimize the use and discharge of water by using wet blankets or similar methods to maintain moisture when curing concrete.

Concrete Finishing

The Contractor shall collect and dispose of water and solid waste from high-pressure water blasting. Drainage inlets within 50 feet shall be covered before sandblasting. The nozzle shall be kept as close to the surface of the concrete as possible to minimize drift of dust and blast material. Blast residue may contain hazardous material.

Containment structures for concrete finishing operations shall be inspected for damage before each day of use and before predicted precipitation. Liquid and solid waste shall be removed from the containment structure after each work shift.

PAYMENT

The contract lump sum price paid for construction site management shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all the work involved in spill prevention and control, material management, waste management, non-storm water management, and dewatering and identifying, sampling, testing, handling, and disposing of hazardous waste, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

10-1.04 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 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, 34" x 44".
- 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. Noncompliance 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 8-1/2" x 11" 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.

10-1.05 TIME-RELATED OVERHEAD

The Contractor will be compensated for time-related overhead as described below and in conformance with "Force Account Payment" of these special provisions. The Contractor will not be compensated for time-related overhead for delays to the controlling operations caused by the Engineer that occur prior to the first working day, but will be compensated for actual overhead costs incurred, as determined by an independent Certified Public Accountant audit examination and report.

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. Time-related overhead shall not apply to subcontractors of any tier, suppliers, fabricators, manufacturers, or other parties associated with the Contractor.

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 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.

Independent Certified Public Accountant's audit examinations shall be performed in conformance with the requirements of the American Institute of Certified Public Accountants Attestation Standards. Audit examinations and reports 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 receipt 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 cost of performing an audit examination and submitting the independent Certified Public Accountant audit report to verify actual overhead costs incurred prior to the first working day 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. Suspensions ordered due to factors beyond the control of and not caused by the State or the Contractor, for which the Contractor is granted extensions of time in conformance with the provisions of the third paragraph of Section 8-1.07, "Liquidated Damages," of the Standard Specifications.
 - 4. Other suspensions that mutually benefit the State 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 subcontractors of any tier, suppliers, fabricators, manufacturers, and other parties associated with the Contractor shall be considered as included in the various items of work and as specified in Section 9-1.03, "Force Account Payment," of the Standard Specifications.

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.

10-1.06 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.

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)	(800) 642-2444 (800) 227-2600
Underground Service Alert-Southern California (USA)	(800) 422-4133 (800) 227-2600

10-1.07 MOBILIZATION

Mobilization shall conform to the provisions in Section 11, "Mobilization," of the Standard Specifications.

10-1.08 CONSTRUCTION AREA TRAFFIC CONTROL DEVICES

Flagging, signs, and temporary 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 temporary traffic control devices are defined as small and lightweight (less than 100 pounds) devices. These devices shall be certified as crashworthy by crash testing, crash testing of similar devices, or years of demonstrable safe performance. Category 1 temporary 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 temporary traffic control devices at least 5 days before beginning any work using the devices or within 2 days after the request if the devices are already in use. Self-certification shall be provided by the manufacturer or Contractor and shall include the following:

- A. Date,
- B. Federal Aid number (if applicable),
- C. Contract number, district, county, route and post mile of project limits,
- D. Company name of certifying vendor, street address, city, state and zip code,
- E. Printed name, signature and title of certifying person; and
- F. Category 1 temporary traffic control devices that will be used on the project.

The Contractor may obtain a standard form for self-certification from the Engineer.

Category 2 temporary traffic control devices are defined as small and lightweight (less than 100 pounds) devices that are not expected to produce significant vehicular velocity change, but may cause potential harm to impacting vehicles. Category 2 temporary traffic control devices include barricades and portable sign supports.

Category 2 temporary traffic control devices shall be on the Federal Highway Administration's (FHWA) list of Acceptable Crashworthy Category 2 Hardware for Work Zones. This list is maintained by FHWA and can be located at:

http://safety.fhwa.dot.gov/roadway_dept/road_hardware/listing.cfm?code=workzone

The Department also maintains this list at:

<http://www.dot.ca.gov/hq/traffops/signtech/signdel/pdf/Category2.pdf>

Category 2 temporary traffic control devices that have not received FHWA acceptance shall not be used. Category 2 temporary traffic control devices in use that have received FHWA acceptance shall be labeled with the FHWA acceptance letter number and the name of the manufacturer. The label shall be readable and permanently affixed by the manufacturer. Category 2 temporary traffic control devices without a label shall not be used.

If requested by the Engineer, the Contractor shall provide a written list of Category 2 temporary traffic control devices to be used on the project at least 5 days before beginning any work using the devices or within 2 days after the request if the devices are already in use.

Category 3 temporary traffic control devices consist of temporary traffic-handling equipment and devices that weigh 100 pounds or more and are expected to produce significant vehicular velocity change to impacting vehicles. Temporary traffic-handling equipment and devices include crash cushions, truck-mounted attenuators, temporary railing, temporary barrier, and end treatments for temporary railing and barrier.

Type III barricades may be used as sign supports if the barricades have been successfully crash tested, meeting the NCHRP Report 350 criteria, as one unit with a construction area sign attached.

Category 3 temporary traffic control devices shall be shown on the plans or on the Department's Highway Safety Features list. This list is maintained by the Division of Engineering Services and can be found at:

http://www.dot.ca.gov/hq/esc/approved_products_list/HighwaySafe.htm

Category 3 temporary traffic control devices that are not shown on the plans or not listed on the Department's Highway Safety Features list shall not be used.

Full compensation for providing self-certification for crashworthiness of Category 1 temporary traffic control devices and for providing a list of Category 2 temporary traffic control devices used on the project shall be considered as included in the prices paid for the various items of work requiring the use of the Category 1 or Category 2 temporary traffic control devices and no additional compensation will be allowed therefor.

10-1.09 CONSTRUCTION AREA SIGNS

Construction area signs for temporary traffic control 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 "Furnish Sign" of 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. Type III, IV, VII, VIII, or IX retroreflective sheeting shall be used for stationary mounted 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.

Unless otherwise shown on the plans or specified in these special provisions, the color of construction area warning and guide signs shall have black legend and border on orange background, except W10-1 or W47(CA) (Highway-Rail Grade Crossing Advance Warning) sign shall have black legend and border on yellow background.

Orange background on construction area signs shall be fluorescent orange.

Repair to construction area sign panels will not be allowed, except when approved by the Engineer. At nighttime under vehicular headlight illumination, sign panels that exhibit irregular luminance, shadowing or dark blotches shall be immediately replaced at the Contractor's expense.

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)	(800) 642-2444 (800) 227-2600
Underground Service Alert-Southern California (USA)	(800) 422-4133

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. The post hole diameter, if backfilled with portland cement concrete, shall be at least 4 inches greater than the longer dimension of the post cross section.

Construction area signs placed within 15 feet from the edge of the travel way shall be mounted on stationary mounted sign supports as specified in "Construction Area Traffic Control Devices" of these special provisions.

The Contractor shall maintain accurate information on construction area signs. Signs that are no longer required shall be immediately covered or removed. Signs that convey inaccurate information shall be immediately replaced or the information shall be corrected. Covers shall be replaced when they no longer cover the signs properly. The Contractor shall immediately restore to the original position and location any sign that is displaced or overturned, from any cause, during the progress of work.

10-1.10 MAINTAINING TRAFFIC

Attention is directed to Section 7-1.08, "Public Convenience," Section 7-1.09, "Public Safety," and Section 12, "Construction Area Traffic Control Devices," of the Standard Specifications and to the provisions in "Public Safety" and "Portable Changeable Message Sign" 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, "Public Safety."

Lane, ramp, connector and shoulder closures shall conform to the provisions in section "Traffic Control System for Lane Closure" of these special provisions.

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

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

A portable changeable message sign shall be placed for each lane, ramp, connector or shoulder closure, and detour to preceding or next ramp, prior to the first advance warning sign shown on the plans, or as directed by the Engineer.

Whenever work vehicles or equipment are parked within 6 feet of a traffic lane, the shoulder area shall be closed as shown on the plans.

Except as noted herein, lanes and ramps shall be closed only during the hours shown on the charts included in this section "Maintaining Traffic." Except work required under Section 7-1.08, "Public Convenience," and Section 7-1.09, "Public Safety," work that interferes with public traffic shall be performed only during the hours shown for lane closures.

The maximum length of any lane closure shall be limited to 1 mile.

The Contractor shall notify the Engineer 7 calendar days prior to a ramp or connector closure. Advance portable changeable message signs shall be posted on the ramps or connectors, a minimum of 3 calendar days prior to the actual closure. Portable changeable message signs shall be placed when the ramp or connector is closed as shown on the plans or as directed by the Engineer. When a ramp or connector is closed, public traffic shall be detoured to the preceding or next ramp as shown on the plans or as directed by the Engineer. When portable changeable message signs are no longer required, they shall be removed as directed by the Engineer.

Full compensation for advance portable changeable message signs shall be considered as included in the contract lump sum price paid for portable changeable message signs and no additional compensation will be allowed therefore,

No two on-ramps, or two off-ramps shall be closed at the same time except as otherwise provided in the special provisions and as permitted by the Engineer.

Except as noted herein, no ramp shall be closed for any longer than one work shift.

Furnishing, erecting, maintaining, and removing special portable detour signs (SC3) along the detour route not covered in the detour plans as directed by the Engineer shall be paid for as extra work as provided in Section 4-1.03 of the Standard Specification.

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 a designated legal holidays falls on Monday, the full width of the traveled way shall be open for use by public traffic the following Tuesday and on the preceding Friday, Saturday, and Sunday.

Minor deviations from the requirements of this section concerning hours of work which do not significantly change the cost of the work may be permitted upon the written request of the Contractor, if in the opinion of the Engineer, public traffic will be better served and the work expedited. These deviations shall not be adopted by the Contractor until the Engineer has approved the deviations in writing. All other modifications will be made by contract change order.

Chart 1																																	
Multilane Lane Requirements																																	
Location: Northbound												Location: 03-GLE-5-PM 0.0/8.0																					
												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	1	1	1	1	1	1	1	1	1	1									1	1	1	1	1	1	1								
Fridays	1	1	1	1	1	1	1	1	1	1													1	1	1								
Saturdays	1	1	1	1	1	1	1	1	1	1									1	1	1	1	1	1	1								
Sundays	1	1	1	1	1	1	1	1	1	1													1	1	1								
Day before designated legal holiday & Designated legal holidays																																	
Legend:																																	
<input checked="" type="checkbox"/> 1 One lane, a minimum of 11 feet wide, shall be open in direction of travel.																																	
<input type="checkbox"/> No closure allowed.																																	
REMARKS: Ramp closure allowed during lane closure.																																	

Chart 2																																	
Multilane Lane Requirements																																	
Location: Southbound												Location: 03-GLE-5-PM 0.0/8.0																					
												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	1	1	1	1	1	1	1	1	1	1									1	1	1	1	1	1	1								
Fridays	1	1	1	1	1	1	1	1	1	1												1	1	1	1								
Saturdays	1	1	1	1	1	1	1	1	1	1												1	1	1	1								
Sundays	1	1	1	1	1	1	1	1	1	1													1	1	1								
Day before designated legal holiday & Designated legal holidays																																	
Legend:																																	
<input checked="" type="checkbox"/> 1 One lane, a minimum of 11 feet wide, shall be open in direction of travel.																																	
<input type="checkbox"/> No closure allowed.																																	
REMARKS: Ramp closure allowed during lane closure.																																	

**Chart 3
Multilane Lane Requirements**

Location: Northbound Location: 03-GLE-5-PM 8.0/15.0

FROM HOUR TO HOUR	a.m.											p.m.													
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Mondays through Thursdays	1	1	1	1	1	1	1	1	1	1										1	1	1	1	1	1
Fridays	1	1	1	1	1	1	1	1	1	1											1	1	1	1	1
Saturdays	1	1	1	1	1	1	1	1	1	1											1	1	1	1	1
Sundays	1	1	1	1	1	1	1	1	1	1	1										1	1	1	1	1
Day before designated legal holiday & Designated legal holidays																									

Legend:
 1 One lane, a minimum of 11 feet wide, shall be open in direction of travel.
 No closure allowed.

REMARKS: Ramp closure allowed during lane closure.

**Chart 4
Multilane Lane Requirements**

Location: Southbound Location: 03-GLE-5-PM 8.0/15.0

FROM HOUR TO HOUR	a.m.											p.m.													
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Mondays through Thursdays	1	1	1	1	1	1	1	1	1	1											1	1	1	1	1
Fridays	1	1	1	1	1	1	1	1	1	1													1	1	1
Saturdays	1	1	1	1	1	1	1	1	1	1											1	1	1	1	1
Sundays	1	1	1	1	1	1	1	1	1	1	1												1	1	1
Day before designated legal holiday & Designated legal holidays																									

Legend:
 1 One lane, a minimum of 11 feet wide, shall be open in direction of travel.
 No closure allowed.

REMARKS: Ramp closure allowed during lane closure.

Chart 5 Multilane Lane Requirements																									
Location: Northbound												Location: 03-GLE-5-PM 15.0/22.0													
FROM HOUR TO HOUR	a.m.											p.m.													
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Mondays through Thursdays	1	1	1	1	1	1	1	1	1	1										1	1	1	1	1	1
Fridays	1	1	1	1	1	1	1	1	1														1	1	1
Saturdays	1	1	1	1	1	1	1	1	1										1	1	1	1	1	1	1
Sundays	1	1	1	1	1	1	1	1	1	1										1	1	1	1	1	1
Day before designated legal holiday & Designated legal holidays																									
Legend:																									
<input checked="" type="checkbox"/> 1 One lane, a minimum of 11 feet wide, shall be open in direction of travel.																									
<input type="checkbox"/> No closure allowed.																									
REMARKS: Ramp closure allowed during lane closure.																									

Chart 6 Multilane Lane Requirements																									
Location: Southbound												Location: 03-GLE-5-PM 15.0/22.0													
FROM HOUR TO HOUR	a.m.											p.m.													
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Mondays through Thursdays	1	1	1	1	1	1	1	1	1	1									1	1	1	1	1	1	1
Fridays	1	1	1	1	1	1	1	1	1	1											1	1	1	1	1
Saturdays	1	1	1	1	1	1	1	1	1										1	1	1	1	1	1	1
Sundays	1	1	1	1	1	1	1	1	1	1												1	1	1	1
Day before designated legal holiday & Designated legal holidays																									
Legend:																									
<input checked="" type="checkbox"/> 1 One lane, a minimum of 11 feet wide, shall be open in direction of travel.																									
<input type="checkbox"/> No closure allowed.																									
REMARKS: Ramp closure allowed during lane closure.																									

10-1.11 CLOSURE REQUIREMENTS AND CONDITIONS

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

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

CLOSURE SCHEDULE

By noon Monday, the Contractor shall submit a written schedule of planned closures for the following week period, defined as Friday noon through the following Friday noon. Closures involving work (temporary barrier placement and paving operations) that will reduce horizontal clearances, traveled way inclusive of shoulders, to 2 lanes or less shall be submitted not less than 18 working days and no more than 90 working days before the anticipated start of operation. Closures involving work (pavement overlay, overhead sign installation, falsework and girder erection) that will reduce the vertical clearances available to the public, shall be submitted not less than 18 working days and no more than 90 working days before the anticipated start of operation.

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, 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 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 compensation for the suspension of work resulting from the late reopening of closures.

COMPENSATION

The Contractor shall notify the Engineer of 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 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, 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.

10-1.12 TRAFFIC CONTROL SYSTEM FOR LANE CLOSURE

A traffic control system shall consist of closing traffic lanes and ramps 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 of responsibility for providing additional devices or taking measures as may be necessary to comply with the provisions in Section 7-1.09, "Public Safety," of the Standard Specifications.

During traffic stripe operations and pavement marker placement operations using bituminous adhesive, traffic shall be controlled, at the option of the Contractor, with either stationary or moving lane closures. During other operations, traffic shall be controlled with stationary lane closures. Attention is directed to the provisions in Section 84-1.04, "Protection From Damage," and Section 85-1.06, "Placement," 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.

STATIONARY LANE CLOSURE

When lane and ramp 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.

Each vehicle used to place, maintain and remove components of a traffic control system on multilane highways shall be equipped with a Type II flashing arrow sign which shall be in operation when the vehicle is being used for placing, maintaining or removing the components. Vehicles equipped with Type II flashing arrow sign not involved in placing, maintaining or removing the components when operated within a stationary type lane closure shall only display the caution display mode. The sign shall be controllable by the operator of the vehicle while the vehicle is in motion. The flashing arrow sign shown on the plans shall not be used on the vehicles which are doing the placing, maintaining and removing of components of a traffic control system and shall be in place before a lane closure requiring the sign's use is completed.

Vehicles used to place, maintain and remove components of the traffic control system shall be equipped with cellular phones and radios to maintain contact with personnel in the work zone, and to facilitate implementation of the directions of the Engineer.

MOVING LANE CLOSURE

Flashing arrow signs used in moving lane closures shall be truck-mounted. Changeable message signs used in moving lane closure operations shall conform to the provisions in Section 12-3.12, "Portable Changeable Message Signs," of the Standard Specifications, except the signs shall be truck-mounted and the full operation height of the bottom of the sign may be less than 7 feet above the ground, but should be as high as practicable.

Truck-mounted attenuators (TMA) for use in moving lane closures shall be any of the following approved models, or equal:

- A. Hexfoam TMA Series 3000, Alpha 1000 TMA Series 1000 and Alpha 2001 TMA Series 2001, manufactured by Energy Absorption Systems, Inc., One East Wacker Drive, Chicago, IL 60601-2076, telephone (312) 467-6750
 1. Distributor (northern): Traffic Control Service, Inc., 8585 Thys Court, Sacramento, CA 95828, telephone (800) 884-8274, FAX (916) 387-9734
 2. Distributor (southern): Traffic Control Service, Inc., 1881 Betmor Lane, Anaheim, CA 92805, telephone (800) 222-8274
- B. Cal T-001 Model 2 or Model 3, manufacturer and distributor: Hexcel Corporation, 11711 Dublin Boulevard, P.O. Box 2312, Dublin, CA 94568, telephone (925) 551-4900
- C. Renco Rengard Model Nos. CAM 8-815 and RAM 8-815, manufacturer and distributor: Renco Inc., 1582 Pflugerville Loop Road, P.O. Box 730, Pflugerville, TX 78660-0730, telephone (800) 654-8182

Each TMA shall be individually identified with the manufacturer's name, address, TMA model number, and a specific serial number. The names and numbers shall each be a minimum 1/2 inch high and located on the left (street) side at the lower front corner. The TMA shall have a message next to the name and model number in 1/2 inch high letters which states, "The bottom of this TMA shall be _____ inches \pm _____ inch above the ground at all points for proper impact performance." Any TMA which is damaged or appears to be in poor condition shall not be used unless recertified by the manufacturer. The Engineer shall be the sole judge as to whether used TMAs supplied under this contract need recertification. Each unit shall be certified by the manufacturer to meet the requirements for TMA in conformance with the standards established by the Transportation Laboratory.

Approvals for new TMA designs proposed as equal to the above approved models shall be in conformance with the procedures (including crash testing) established by the Transportation Laboratory. For information regarding submittal of new designs for evaluation contact: Transportation Laboratory, 5900 Folsom Boulevard, Sacramento, California 95819.

New TMAs proposed as equal to approved TMAs or approved TMAs determined by the Engineer to need recertification shall not be used until approved or recertified by the Transportation Laboratory.

PAYMENT

The contract lump sum price paid for traffic control system shall include full compensation for furnishing all labor, materials (including signs), tools, equipment, and incidentals (including cellular phones and radios), and for doing all the work involved in placing, removing, storing, maintaining, moving to new locations, replacing and disposing of the components of the traffic control system shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

The adjustment provisions in Section 4-1.03, "Changes," of the Standard Specifications shall not apply to the item of traffic control system. Adjustments in compensation for traffic control system will be made only for increased or decreased traffic control system required by changes ordered by the Engineer and will be made on the basis of the cost of the increased or decreased traffic control necessary. The adjustment will be made on a force account basis as provided in Section 9-1.03, "Force Account Payment," of the Standard Specifications for increased work and estimated on the same basis in the case of decreased work.

Traffic control system required by work which is classed as extra work, as provided in Section 4-1.03D of the Standard Specifications, will be paid for as a part of the extra work.

10-1.13 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 California MUTCD or as relieving the Contractor from the responsibilities specified 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. On multilane roadways (freeways and expressways), edgeline 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 24 feet. 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 24 feet 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.

Full compensation for furnishing, placing, maintaining, and removing the temporary raised pavement markers used for temporary laneline and centerline delineation 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.

TEMPORARY EDGELINE DELINEATION

Whenever edgelines are obliterated on multilane roadways (freeways and expressways), the edgeline delineation to be provided for that area adjacent to lanes open to public traffic shall consist of, at the option of the Contractor, either solid 4 inch wide traffic stripe of the same color as the stripe the temporary edgeline delineation replaces or shall consist of traffic cones, portable delineators or channelizers placed at longitudinal intervals not to exceed 100 feet.

Traffic stripe (4 inch wide) placed for temporary edgeline delineation, which will require removal, shall consist of temporary removable construction grade striping and pavement marking tape listed in "Prequalified and Tested Signing and Delineation Materials" of these special provisions. Temporary removable construction grade striping and pavement marking tape when used shall be applied in conformance with the manufacturer's recommendations. Where removal of the 4-inch wide traffic stripe will not be required, painted traffic stripe used for temporary edgeline delineation shall conform to "Paint Traffic Stripe and Pavement Marking" of these special provisions, Section 84-3, "Painted Traffic Stripes And Pavement Markings," of the Standard Specifications, except for payment and the number of coats shall be, at the option of the Contractor, either one or 2 coats. The quantity of painted traffic stripe used for temporary edgeline delineation will not be included in the quantities of paint traffic stripe to be paid for. Paint shall not be used for temporary edgeline delineation on the final layer of surfacing.

The lateral offset for traffic cones, portable delineators or channelizers used for temporary edgeline delineation shall be determined by the Engineer. If traffic cones or portable delineators are used as temporary pavement delineation for edgelines, the Contractor shall provide personnel to remain at the project site to maintain the cones or delineators during hours of the day that the cones or delineators are in use.

Channelizers used for temporary edgeline delineation shall be the surface mounted type and shall be orange in color. Channelizer bases shall be cemented to the pavement in the same manner provided for cementing pavement markers to pavement in "Pavement Markers" of these special provisions, except epoxy adhesive shall not be used to place channelizers on the top layer of pavement. Channelizers shall be, at the Contractor's option, one of the surface mount types (36 inch) listed in "Prequalified and Tested Signing and Delineation Materials" of these special provisions.

Temporary edgeline delineation shall be removed when no longer required for the direction of public traffic, as determined by the Engineer.

Full compensation for furnishing, placing, maintaining, and removing temporary edgeline delineation shall be considered as included in the contract prices paid for the items of work that obliterated the edgeline pavement delineation and no separate payment will be made therefor.

10-1.14 PORTABLE CHANGEABLE MESSAGE SIGN

Portable changeable message signs shall be furnished, placed, operated, and maintained during each lane, ramp, connector, shoulder closure and detour to preceding/next ramp at those locations approved by the Engineer 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.

The number of portable changeable message signs required at any one time will be determine by the number of lane, ramp and shoulder closures that the Contractor determines are necessary for his operations.

Portable changeable message signs will be paid for on a lump sump basis.

The contract lump sump price paid for portable changeable message signs shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in furnishing, placing, operating, maintaining, repairing, replacing, changing messages daily as requested by the Engineer, transporting from location to location, and removing the portable changeable message signs, complete in place, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

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

REMOVE PAVEMENT MARKER

Existing pavement markers, including underlying adhesive, when no longer required for traffic lane delineation as determined by the Engineer, shall be removed and disposed of.

REMOVE TRAFFIC STRIPE AND PAVEMENT MARKING

Traffic stripe and pavement marking shall be removed as directed by the Engineer.

Attention is directed to "Water Pollution Control" of these special provisions.

Waste from removal of yellow thermoplastic and yellow painted traffic stripe and pavement marking contains lead chromate in average concentrations greater than or equal to 5 mg/L Soluble Lead or 1000 mg/kg Total Lead. Residue produced from when yellow thermoplastic and yellow paint are removed may contain heavy metals in concentrations that exceed thresholds established by the California Health and Safety Code and may produce toxic fumes when heated.

The removed yellow thermoplastic and yellow paint shall be disposed of at a Class 1 disposal facility or a Class 2 disposal facility permitted by the Regional Water Quality Control Board in conformance with the requirements of the disposal facility operator within 90 days after accumulating 100 kg of residue and dust. The Contractor shall make necessary arrangements with the operator of the disposal facility to test the yellow thermoplastic and yellow paint residue as required by the facility and these special provisions. Testing shall include, at a minimum, (1) Total Lead and Chromium by EPA Method 7000 series and (2) Soluble Lead and Chromium by California Waste Extraction Test. From the first 3360 L of waste or portion thereof, if less than 3360 L of waste are produced, a minimum of four randomly selected samples shall be taken and analyzed. From each additional 840 L of waste or portion thereof, if less than 840 L are produced, a minimum of one additional random sample shall be taken and analyzed. The Contractor shall submit the name and location of the disposal facility and analytical laboratory along with the testing requirements to the Engineer not less than 15 days prior to the start of removal of yellow thermoplastic and yellow painted traffic stripe and pavement marking. The analytical laboratory shall be certified by the Department of Health Services Environmental Laboratory Accreditation Program. Test results shall be provided to the Engineer for review prior to signing a waste profile as requested by the disposal facility, prior to issuing an EPA identification number, and prior to allowing removal of the waste from the site.

The Contractor shall prepare a project specific Lead Compliance Plan to prevent or minimize worker exposure to lead while handling removed yellow thermoplastic and yellow paint residue. Attention is directed to Title 8, California Code of Regulations, Section 1532.1, "Lead," for specific Cal-OSHA requirements when working with lead.

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

Prior to removing yellow thermoplastic and yellow painted traffic stripe and pavement marking, personnel who have no prior training, including State personnel, shall complete a safety training program provided by the Contractor that meets the requirements of Title 8, California Code of Regulations, Section 1532.1, "Lead," and the Contractor's Lead Compliance Program.

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

Where grinding or other methods approved by the Engineer are used to remove yellow thermoplastic and yellow painted traffic stripe and pavement marking, the removed residue, including dust, shall be contained and collected immediately. Sweeping equipment shall not be used. Collection shall be by a high efficiency particulate air (HEPA) filter equipped vacuum attachment operated concurrently with the removal operations or other equally effective methods approved by the Engineer. The Contractor shall submit a written work plan for the removal, storage, and disposal of yellow thermoplastic and yellow painted traffic stripe and pavement marking to the Engineer for approval not less than 15 days prior to the start of the removal operations. Removal operations shall not be started until the Engineer has approved the work plan.

The removed yellow thermoplastic and yellow painted traffic stripe and pavement marking residue shall be stored and labeled in covered containers. Labels shall conform to the provisions of Title 22, California Code of Regulations, Sections 66262.31 and 66262.32. Labels shall be marked with date when the waste is generated, the words "Hazardous Waste", composition and physical state of the waste (for example, asphalt grindings with thermoplastic or paint), the word "Toxic", the name and address of the Engineer, the Engineer's telephone number, contract number, and Contractor or subcontractor. The containers shall be a type approved by the United States Department of Transportation for the transportation and temporary storage of the removed residue. The containers shall be handled so that no spillage will occur. The containers shall be stored in a secured enclosure at a location within the project limits until disposal, as approved by the Engineer.

If the yellow thermoplastic and yellow painted traffic stripe and pavement marking residue is transported to a Class 1 disposal facility, a manifest shall be used, and the transporter shall be registered with the California Department of Toxic Substance Control. The Engineer will obtain the United States Environmental Protection Agency Identification Number and sign all manifests as the generator within 2 working days of receiving sample test results and approving the test methods.

The Contractor shall assume that the yellow paint removed is not regulated under the Federal Resource Conservation and Recovery Act (RCRA). Additional disposal costs for removal residue regulated under RCRA, as determined by test results required by the disposal facility, will be paid for as extra work as provided in Section 4-1.03D, "Extra Work," of the Standard Specifications.

Nothing in these special provisions shall relieve the Contractor of the Contractor's responsibilities as specified in Section 7-1.09, "Public Safety," of the Standard Specifications.

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

Full compensation for providing a written work plan for the removal, storage, and disposal of yellow thermoplastic and yellow painted traffic stripe and pavement marking shall be considered as included in the contract prices paid per meter for remove yellow thermoplastic traffic stripe and remove yellow painted traffic stripe or per square meter for remove yellow thermoplastic pavement marking and yellow painted pavement marking 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 30 inches 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 typical cross sections or as designated by the Engineer. The final cut shall result in a uniform surface conforming to the typical cross sections. 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 0.15-foot 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 50 feet of the planer, unless otherwise directed by the Engineer.

Cold plane asphalt concrete pavement will be measured by the square yard. 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 yard 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.

10-1.15 SHOULDER BACKING

This work shall consist of constructing shoulder backing adjacent to the edge of new pavement surfacing in conformance with the details shown on the plans and these special provisions.

Material for shoulder backing shall be imported material or material processed from reclaimed portland cement concrete, lean concrete base, cement treated base, or a combination of any of these materials, conforming to the following grading and quality requirements:

Grading Requirements		Quality Requirements		
Sieve Sizes	Percentage Passing	Specification	California Test	Requirement
2"	100	Sand Equivalent	217	10 minimum-30 maximum
1"	75 - 100	Resistance (R-value)	301	50 minimum
No. 4	40 - 60	Percentage Crushed Particles	205	75% minimum
No. 30	12 - 35	Durability Index	229	20 minimum
No. 200	5 - 20			

At the option of the Contractor, aggregate for shoulder backing may consist of material processed from reclaimed asphalt concrete conforming to the following grading and quality requirements:

Grading Requirements		Quality Requirements		
Sieve Sizes	Percentage Passing	Specification	California Test	Requirement
2"	100	Resistance (R-value)	301	50 minimum
3/4"	70 - 100	Percentage Crushed Particles	205	75% minimum
No. 4	30 - 80	Durability Index	229	20 minimum

Coarse aggregate consisting of material retained on the No. 4 sieve, shall consist of material of which at least 75 percent by weight shall be crushed particles with a minimum of two fractured faces, as determined in conformance with California Test 205.

Shoulder backing material shall have a minimum unit weight of 135 pounds per cubic foot as determined in conformance with California Test 212.

Shoulder backing material consisting of reclaimed asphalt concrete, shall not be placed within 100 feet measured horizontally of any culvert, watercourse, or bridge within the project limits.

The areas where shoulder backing is to be constructed shall be cleared of weeds, grass, and debris. Removed weeds grass and debris 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.

Prior to placement of shoulder backing material, basement material shall be scarified to a minimum depth of 3 inches. Immediately prior to placement of shoulder backing material, scarified material shall be watered. Shoulder backing material shall be placed, watered, and rolled a minimum of two passes with a steel tired roller weighing not less than 8 tons to form a smooth, compacted surface. Watering shall conform to the provisions in Section 17, "Watering," of the Standard Specifications.

Shoulder backing material shall not be deposited on new pavement surfacing prior to placing the material in the final position, nor shall the material be deposited onto new pavement surfacing during mixing, watering, and blading operations.

Shoulder backing construction shall be completed along the edges of any portion of new pavement surfacing within 5 days after completion of that portion of the new surfacing. Prior to opening a lane adjacent to uncompleted shoulder backing to uncontrolled public traffic, the Contractor shall furnish, place, and maintain portable delineators and W8-9 (LOW SHOULDER) signs off of and adjacent to the new pavement surfacing. Portable delineators shall be placed at the beginning and along the drop-off of the edge of pavement, in the direction of travel, at successive maximum intervals of 500 feet on tangents and 200 feet on curves. W8-9 (LOW SHOULDER) signs shall be placed at the beginning and along the drop-off at successive maximum intervals of 2,000 feet. The portable delineators and W8-9 (LOW SHOULDER) signs shall be maintained in place at each location until the shoulder backing is completed at that location. Portable delineators and signs shall conform to the provisions in Section 12, "Construction Area Traffic Control Devices," of the Standard Specifications, except the signs may be set on temporary portable supports or on barricades.

Quantities of imported material (shoulder backing) will be measured by the ton in conformance with the provisions in Section 9-1.01, "Measurement of Quantities," of the Standard Specifications, except that the weight of water in the aggregate will not be determined and no deduction will be made from the weight of material delivered to the work.

The contract price paid per ton for imported material (shoulder backing) shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in constructing shoulder backing, complete in place, including furnishing, placing, maintaining, and removing portable delineators, W8-9 (LOW SHOULDER) signs, and temporary supports or barricades for the signs, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

10-1.16 FIBER ROLL

Fiber roll shall be furnished, installed, maintained, and later removed at the locations shown on the approved Storm Water Pollution Prevention Plan in conformance with "Water Pollution Control" of these special provisions, and in conformance with details shown on the plans and these special provisions.

Fiber roll shall be installed on excavation and embankment slopes and other disturbed soil areas, active or nonactive.

Fiber roll shall be one of the water pollution control practices for sediment control. The Storm Water Pollution Prevention Plan shall include the use of fiber roll.

At the option of the Contractor, fiber roll shall be Type 1 or Type 2.

MATERIALS

Fiber Roll

Fiber roll shall be either:

- A. Constructed with a premanufactured blanket consisting of either wood excelsior, rice or wheat straw, or coconut fibers or a combination of these materials. The blanket shall be between 6 feet and 8 feet in width and between 65 feet and 95 feet in length. Wood excelsior shall be individual fibers, of which 80 percent shall be 6 inches or longer in length. The blanket shall have a photodegradable plastic netting or biodegradable jute, sisal, or coir fiber netting on at least one side. The blanket shall be rolled along the width and secured with jute twine spaced 6 feet apart along the full length of the roll and placed 6 inches from the ends of each roll. The finished roll shall be between 8 inches and 10 inches in diameter, a minimum of 20 feet in length, and shall weigh a minimum of 0.5 pound per linear foot. More than one blanket may be required to achieve the finished roll diameter. When more than one blanket is required, blankets shall be jointed longitudinally with an overlap of 6 inches along the length of the blanket.
- B. A premanufactured roll of rice or wheat straw, wood excelsior, or coconut fiber encapsulated within a photodegradable plastic or biodegradable jute, sisal, or coir fiber netting. The netting shall have a minimum durability of one year after installation. The netting shall be secured tightly at each end of the roll. Rolls shall be between 8 inches and 12 inches in diameter. Rolls between 8 inches and 10 inches in diameter shall have a minimum weight of 1 pound per linear foot and a minimum length of 20 feet. Rolls between 10 inches and 12 inches in diameter shall have a minimum weight of 3 pounds per linear foot and a minimum length of 10 feet.

Stakes

Wood stakes shall be a minimum of 1" x 1" x 24" in size for Type 1 installation, or a minimum of 1" x 2" x 24" in size for Type 2 installation. Wood stakes shall be untreated fir, redwood, cedar, or pine and cut from sound timber. They shall be straight and free of loose or unsound knots and other defects which would render them unfit for the purpose intended. Metal stakes shall not be used.

Rope

Rope shall be biodegradable, such as sisal or manila, with a minimum diameter of 1/4 inch.

INSTALLATION

Fiber roll shall be installed as follows:

- A. Fiber roll (Type 1): Furrows shall be constructed to a depth between 2 inches and 4 inches, and to a sufficient width to hold the fiber roll. Stakes shall be installed 24 inches apart along the length of the fiber rolls and stopped at 12 inches from each end of the rolls. Stakes shall be driven to a maximum of 2 inches above, or flush with the top of the roll.
- B. Fiber roll (Type 2): Rope and notched stakes shall be used to restrain the fiber rolls against the slope. Stakes shall be driven into the slope until the notch is even with the top of the fiber roll. Rope shall be knotted at each stake and laced between stakes. After installation of the rope, stakes shall be driven into the slope such that the rope will hold the fiber roll tightly to the slope. Furrows will not be required.
- C. Fiber rolls shall be placed 10 feet apart along the slope for slope inclination (horizontal:vertical) of 2:1 and steeper, 15 feet apart along the slope for slope inclination between 2:1 and :4:1, 20 feet apart along the slope for slope inclination between 4:1 and 10:1, and a maximum of 50 feet apart along the slope for slope inclination of 10:1 and flatter.
- D. The bedding area for the fiber roll shall be cleared of obstructions including rocks, clods, and debris greater than one inch in diameter before installation.
- E. Fiber rolls shall be installed approximately parallel to the slope contour.

When no longer required, as determined by the Engineer, fiber rolls shall be removed and 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. Fiber rolls may be abandoned in place when approved in writing by the Engineer.

Ground disturbances including holes and depressions caused by the installation and removal of the temporary fiber roll shall be backfilled and repaired in conformance with the provisions in Section 15-1.02, "Preservation of Property," of the Standard Specifications.

MAINTENANCE

Fiber rolls shall be maintained to disperse concentrated water runoff and to reduce runoff velocities. Split, torn, or unraveling rolls shall be repaired or replaced. Broken or split stakes shall be replaced. Sagging or slumping fiber rolls shall be repaired with additional stakes or replaced. Locations where rills and other evidence of concentrated runoff have occurred beneath the rolls shall be corrected. Fiber rolls shall be repaired or replaced within 24 hours of identifying the deficiency.

MEASUREMENT AND PAYMENT

Quantities of Fiber to be paid for will be determined by the linear foot measured along the centerline of the installed roll. Where Fiber rolls are joined and overlapped, the overlap will be measured as a single installed roll.

The contract price paid per linear foot for Fiber roll shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in installing Fiber rolls, complete in place, including furrow excavation and backfill, maintenance, and removal, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Damage to Fiber rolls resulting from the Contractor's vehicles, equipment, or operations shall be repaired at the Contractor's expense.

10-1.17 FOG SEAL COAT

Fog seal coat shall conform to the provisions in Section 37-1, "Seal Coats," of the Standard Specifications and these special provisions.

Attention is directed to "Order of Work" of these special provisions regarding application of asphaltic emulsion.

Asphaltic emulsion shall be either Grade SS1h or CSS1h.

10-1.18 SEAL RANDOM CRACKS IN EXISTING SURFACING

Cracks in existing asphalt concrete surfacing of traffic lanes and shoulders shall be prepared and filled with crack sealant as shown on the plans and in conformance with these special provisions.

Cracks 1/4 inch wide and wider in existing asphalt concrete surfacing and shoulders shall be prepared and sealed. Limits of lanes and shoulders to be prepared and sealed shall be as designated on the plans or directed by the Engineer.

The Contractor shall provide the Engineer with a Certificate of Compliance conforming to the provisions in Section 6-1.07, "Certificate of Compliance," of the Standard Specifications for each shipment of crack sealant. The certificate shall certify that the sealant conforms to the specifications, and shall be accompanied with storage and heating instructions and cautions for the material.

MATERIALS

Low modulus asphalt crack sealant shall be a mixture of paving asphalt and polymer.

Low modulus asphalt crack sealant shall conform to the following requirements:

Test	Test Method	Requirements
Softening Point	ASTM Designation: D 36	82°C min.
Ductility @ 4°C, 10 mm/min	ASTM Designation: D 113	300 mm min.
Force Ductility @ 4°C	Utah DOT Test Method (1)	18 N max.
Flow	ASTM Designation: D 3407	3 mm max.

Note:

- (1) The Utah DOT Test Method is available for review at the Transportation Laboratory.

Low modulus asphalt crack sealant shall be furnished premixed in containers with an inside liner of polyethylene. Packaged material shall not exceed 66 pounds in weight.

The sealant shall be capable of being melted and applied to cracks at temperatures below 400° F. When heated, it shall readily penetrate cracks 1/4 inch wide or wider.

Cracks that are one inch wide or wider shall be filled with sealant flush with the existing asphalt concrete surfacing and shoulders. While the sealant is still hot, these cracks shall be covered with crushed aggregate conforming to the provisions for Type II slurry seal in Section 37-2.02C, "Aggregate," of the Standard Specifications and compacted with a wetted steel wheel roller or vibrating plate compactor large enough to compact the sealant to the cross section shown on the plans.

PREPARATION

Cracks to be filled and adjacent asphalt concrete surfacing shall be cleaned and shall be free of dirt, vegetation, debris and loose sealant. Cleaning shall be done by air blasting. Old sealant which protrudes above the asphalt concrete surfacing shall be completely removed. Routing will not be required.

Hot compressed air or other means, approved by the Engineer, shall be used to clean and dry the crack immediately prior to application of crack sealant.

APPLICATION

Crack sealant shall be applied only after the cracks and adjacent asphalt concrete surfacing have been cleaned and dried.

Crack sealant material shall be spread with a nozzle or device approved for use by the Engineer and be placed within the specified temperature range and to the dimensions shown on the plans.

Cracks shall be squeegeed as necessary after application of the crack sealant material. Do not overfill.

Within 2 days after application of sealant, sealed cracks that reopen shall be resealed.

Light brooming shall be performed to remove loose excessive sand prior to opening a lane to public traffic that is not controlled by a pilot car.

MEASUREMENT AND PAYMENT

Seal random cracks will be measured by lane mile, from actual measurement along the edge of each paved lane, parallel with the gradient of the pavement, or by lane length calculated using post mile designations, as determined by the Engineer.

The contract price paid per lane mile for seal random cracks shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all the work involved in sealing random cracks, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Full compensation for cleaning and sealing random cracks in adjacent paved shoulders shall be considered as included in the contract price paid per lane mile for seal random cracks and no additional compensation will be allowed therefor.

10-1.19 ASPHALT CONCRETE

GENERAL

Asphalt concrete shall be Type A and shall conform to the provisions in Section 39, "Asphalt Concrete," of the Standard Specifications and these special provisions.

The grade of asphalt binder to be mixed with aggregate for Type A asphalt concrete shall be Grade PG-70-10 conforming to the provisions in Section 92, "Asphalts," of the Standard Specifications.

The asphalt content of the asphalt mixture will be determined in conformance with the requirements in California Test 379, or in conformance with the requirements in California Test 382.

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 weight of the aggregate over the amount of asphalt binder determined for use in asphalt concrete placed on the traveled way.

The aggregate for Type A asphalt concrete shall conform to the ¾ inch maximum, medium grading specified in Section 39-2.02, "Aggregate," of the Standard Specifications.

RECLAIMED ASPHALT PAVEMENT

The Contractor may produce asphalt concrete using reclaimed asphalt pavement (RAP). Asphalt concrete produced using RAP shall conform to the provisions for asphalt concrete in this section, "Asphalt Concrete," and these special provisions. The Contractor may substitute RAP for a portion of the virgin aggregate in asphalt concrete in an amount not exceeding 15 percent of the asphalt concrete dry aggregate mass.

RAP shall be processed from asphalt concrete removed from pavement surfaces. RAP shall be stored in stockpiles on smooth surfaces free of debris and organic material. RAP stockpiles shall consist only of homogeneous RAP. The Contractor may process and stockpile RAP throughout the project's life. Processing and stockpiling operations shall prevent material contamination and segregation.

The Contractor shall determine the amount of asphalt binder to be mixed with the combined virgin aggregate and RAP in conformance with the requirements in California Test 367 amended by Lab Procedure-9 (LP-9), "Hot Mix Asphalt (HMA) Using Up To 15% Reclaimed Asphalt Pavement (RAP)." LP-9 is available at:

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

At least 21 days before starting production of asphalt concrete using RAP, the Contractor shall submit a proposed asphalt concrete mix design in writing to the Engineer. The mix design submittal shall consist of the following:

A. RAP:

1. Processed stockpile locations.
2. LP-9 test results.
3. Correlation factor for aggregate gradations from California Test 382 and LP-9.
4. Three 70-pound samples of processed RAP representing the material to be used. The three samples shall be split from the sample the Contractor uses to determine the mix design. The Contractor shall obtain and split the samples in conformance with the requirements in California Test 125 and LP-9.
5. The substitution rate for virgin aggregate and percent RAP.

B. Virgin aggregate and supplemental fine aggregate blend:

1. Percent passing values for each sieve size.
2. Aggregate quality tests results.
3. Each aggregate source to be used including producer, location, and California Mine Identification number.
4. Percentage of each aggregate stockpile, cold feed, and hot bin to be used.
5. Gradation of each aggregate stockpile, cold feed, and hot bin to be used.

C. Asphalt binder:

1. Source.
2. Material Safety Data Sheets.

D. Antistrip additives, if used:

1. Name of product.
2. Name of manufacturer.
3. Manufacturer's designation and proposed rate.
4. Location and method of addition.
5. Material Safety Data Sheets.

E. Asphalt concrete:

1. A completed mix design that reflects the percent of RAP to be used including the electronic worksheet identified in LP-9.
2. In graphical format, stability and air voids versus asphalt binder percentage of asphalt in conformance with the requirements in CTM 367.

Asphalt concrete production using RAP shall not begin until the Engineer approves the mix design. If the Engineer fails to review the mix design in 21 days, and if, in the opinion of the Engineer, work completion is delayed as a result of the failure to review, the Engineer will adjust payment and contract time in conformance with the requirements in Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

If proposing a change in the RAP substitution rate, the Contractor shall notify the Engineer. If the substitution rate changes more than 5 percent by dry aggregate mass in the asphalt concrete mixture, the Contractor shall submit a new mix design.

The aggregate gradation for the asphalt concrete produced with RAP shall be calculated based on the mathematical combination of the virgin aggregate gradation during production and the daily RAP gradation. RAP shall be sampled and gradation shall be determined in conformance with the requirements in LP-9. RAP gradations shall be:

A. Determined daily by the Contractor.

- B. Used for the mathematical combination of that day's asphalt concrete production.
- C. Reported to the Engineer.

The Contractor shall perform quality control testing of the RAP source each day asphalt concrete using RAP is produced. The Contractor shall perform quality control testing of the aggregates and the asphalt concrete mixture at least once for every 1000 tons of asphalt concrete using RAP produced, but not less than 2 tests per day.

Daily, the Contractor shall submit to the Engineer:

- A. Results for RAP gradation and the asphalt binder content in RAP determined in conformance with the requirements in LP-9.
- B. Mathematical calculation of the gradation of the virgin aggregate and RAP aggregate blend.
- C. Correlation factor for RAP burn-off determined in conformance with the requirements in LP-9.

RAP proportioning shall conform to the provisions for aggregate proportioning specified in Section 39-3.03, "Proportioning," of the Standard Specifications and these special provisions. The Contractor's mixing equipment shall have a device that safely provides a sample representative of the virgin aggregate and RAP incorporated into the asphalt concrete. The Contractor shall sample in conformance with the requirements in California Test 125 and LP-9.

The temperature of asphalt concrete using RAP shall not exceed 330 °F.

If batch mixing is used, RAP shall be kept separate from the virgin aggregate until both ingredients enter the weighhopper or pugmill. After introduction to the pugmill and before asphalt binder is added, the mixing time for the virgin aggregate and RAP shall not be less than 5 seconds. After asphalt binder is added, the mixing time shall not be less than 30 seconds.

If continuous mixing is used, the RAP shall be protected from direct contact with the burner flame with a device such as a shield, separator, or second drum.

PAINT BINDER (TACK COAT)

Paint binder (tack coat) shall be applied to existing surfaces to be surfaced and between layers of asphalt concrete, except when eliminated by the Engineer.

Paint binder (tack coat) shall be, at the option of the Contractor, either slow-setting asphaltic emulsion, rapid-setting asphaltic emulsion or paving asphalt. Slow-setting asphaltic emulsion and rapid-setting asphaltic emulsion shall conform to the provisions in Section 39-4.02, "Prime Coat and Paint Binder (Tack Coat)," and the provisions in Section 94, "Asphaltic Emulsions," of the Standard Specifications. When paving asphalt is used for paint binder, the grade will be determined by the Engineer. Paving asphalt shall conform to the provisions in Section 39-4.02, "Prime Coat and Paint Binder (Tack Coat)," and the provisions in Section 92, "Asphalts," of the Standard Specifications.

Paint binder (tack coat) shall be applied in the gallon per square yard range limits specified for the surfaces to receive asphalt concrete in the tables below. The exact application rate within the range will be determined by the Engineer.

Application Rates for Asphaltic Emulsion Paint Binder (Tack Coat) on Asphalt Concrete (except Open Graded) and on Portland Cement Concrete Pavement (PCCP)		
Type of surface to receive paint binder (tack coat)	Slow-Setting Asphaltic Emulsion gal/sq yd (Note A)	Rapid-Setting Asphaltic Emulsion gal/sq yd (Note B)
Dense, compact surfaces, between layers, and on PCCP	0.04 - 0.08	0.02 - 0.04
Open textured, or dry, aged surfaces	0.08 - 0.20	0.04 - 0.09

Note A: Slow-setting asphaltic emulsion is asphaltic emulsion diluted with additional water. Water shall be added and mixed with the asphaltic emulsion (containing up to 43 percent water) so the resulting mixture contains one part asphaltic emulsion and not more than one part added water. The water shall be added by the emulsion producer or at a facility that has the capability to mix or agitate the combined blend.

Note B: Undiluted rapid-setting asphaltic emulsion.

Application Rates for Paint Binder (Tack Coat) on Asphalt Concrete (except Open Graded) and on Portland Cement Concrete Pavement (PCCP)	
Type of surface to receive paint binder (tack coat)	Paving Asphalt gal/sq yd
Dense, compact surfaces, between layers, and on PCCP	0.01 – 0.02
Open textured, or dry, aged surfaces	0.02 – 0.06

Application Rates for Asphaltic Emulsion Paint Binder (Tack Coat) on Open Graded Asphalt Concrete		
Type of surface to receive paint binder (tack coat)	Slow-Setting Asphaltic Emulsion gal/sq yd (Note A)	Rapid-setting Asphaltic Emulsion gal/sq yd (Note B)
Dense, compact surfaces and between layers	0.06 - 0.11	0.02 - 0.06
Open textured, or dry, aged surfaces	0.11 - 0.24	0.06 - 0.12

Note A: Slow-setting asphaltic emulsion is asphaltic emulsion diluted with additional water. Water shall be added and mixed with the asphaltic emulsion (containing up to 43 percent water) so the resulting mixture contains one part asphaltic emulsion and not more than one part added water. The water shall be added by the emulsion producer or at a facility that has the capability to mix or agitate the combined blend.

Note B: Undiluted rapid-setting asphaltic emulsion.

When asphaltic emulsion is used as paint binder (tack coat), asphalt concrete shall not be placed until the applied asphaltic emulsion has completely changed color from brown to black.

10-1.20 RUBBERIZED ASPHALT CONCRETE (TYPE O)

Rubberized asphalt concrete (Type O) shall consist of furnishing and mixing Open Graded aggregate and asphalt-rubber binder and spreading and compacting the mixture. Type O rubberized asphalt concrete shall conform, except as otherwise provided, to the provisions for Open Graded asphalt concrete in Section 39, "Asphalt Concrete," of the Standard Specifications and to these special provisions.

GENERAL

The Contractor shall furnish samples of aggregate to the Engineer in conformance with the provisions in Section 39-3.03, "Proportioning," of the Standard Specifications.

The amount of asphalt-rubber binder to be mixed with the aggregate for Type O rubberized asphalt concrete will be determined by the Engineer using the samples of aggregates furnished by the Contractor in conformance with the provisions in Section 39-3.03, "Proportioning," of the Standard Specifications. The Engineer will determine the exact amount of asphalt-rubber binder to be mixed with the aggregate in conformance with the provisions in California Test 368 with the following exceptions. The aggregate shall be mixed with Grade PG 64-16 paving asphalt and the optimum bitumen content shall be determined in conformance with the test procedure. The optimum binder content for rubberized asphalt concrete Type O shall then be determined using the following formula:

- A. $OBC_2 = (OBC_1) \times 1.20$
- B. OBC_1 = Optimum bitumen content using Grade PG 64-16 paving asphalt
- C. OBC_2 = Optimum bitumen content using asphalt-rubber binder

The asphalt-rubber binder content of the Type O rubberized asphalt concrete will be determined by extraction tests in conformance with the provisions in California Test 362.

The Contractor shall 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 material used in asphalt-rubber binder and the asphalt-rubber binder mixture. The Certificate of Compliance shall certify that the material conforms to the provisions in these special provisions. When requested by the Engineer, the Contractor shall also submit samples with the Certificate of Compliance. The Contractor shall provide the Engineer a Material Safety Data Sheet (MSDS) for each of the constituent components of the asphalt-rubber binder, for the completed mixture of asphalt-rubber binder and for the Type O rubberized asphalt concrete.

The Contractor shall provide a Certificate of Compliance for each truck load of crumb rubber modifier (CRM), paving asphalt, and asphalt modifier delivered to the project. The Quality Control Program used by the manufacturer of each ingredient shall include a sampling and testing frequency as follows:

- A. CRM shall be tested, except for the grading requirement, at least once for every 250 tons of production, with a minimum of once for each project. CRM shall be tested for grading for every truck load delivered to the project.
- B. Paving asphalt shall be tested at least once for every 200 tons of production with a minimum of once for each project.
- C. Asphalt modifier shall be tested at least once for every 25 tons of production with a minimum of once for each project.
- D. A copy of the laboratory test results for the test parameters specified in these special provisions for CRM, paving asphalt, and asphalt modifier shall be submitted to the Engineer with the Certificate of Compliance for each truck load of individual material delivered to the project.

PAVING ASPHALT

The grade of paving asphalt to be used in the asphalt-rubber binder shall be Grade PG 64-16 and shall conform to the provisions in Section 92, "Asphalts," of the Standard Specifications and these special provisions.

The paving asphalt for use in asphalt-rubber binder shall be modified with an asphalt modifier.

ASPHALT MODIFIER

The asphalt modifier will be a resinous, high flash point, aromatic hydrocarbon compound and shall conform to the following requirements:

ASPHALT MODIFIER

Test Parameter	ASTM Designation	Requirement
Viscosity, m ² /s (x10 ⁻⁶) at 100°C	D 445	X ±3*
Flash Point, CL.O.C., °C	D 92	207 min.
Molecular Analysis:		
Asphaltenes, percent by mass	D 2007	0.1 max.
Aromatics, percent by mass	D 2007	55 min.

* The symbol "X" is the viscosity of the asphalt modifier the Contractor proposes to furnish. The value "X" which the Contractor proposes shall be between the limits 19 and 36 and shall be submitted in writing to the Engineer. A proposed change, requested by the Contractor, in the value "X" shall require a new asphalt-rubber binder design.

The asphalt modifier shall be proportionately added at the production site where the asphalt-rubber binder is blended and reacted. Asphalt modifier shall be added to the paving asphalt at an amount of 2.5 percent to 6.0 percent by weight of the paving asphalt based on the recommendation of the asphalt-rubber binder supplier. The exact amount will be determined by the Engineer. The paving asphalt shall be at a temperature of not less than 375° F or more than 440° F when the asphalt modifier is added. If the asphalt modifier is combined with the paving asphalt, before being blended with the CRM, the combined paving asphalt and asphalt modifier shall be mixed by circulation for a period of not less than 20 minutes. This premixing of asphalt modifier and the paving asphalt will not be required when the ingredients of the asphalt-rubber binder are proportioned and mixed simultaneously. Asphalt modifier and paving asphalt shall be measured for proportioning with meters conforming to the provisions in Section 9-1.01, "Measurement of Quantities," of the Standard Specifications.

CRUMB RUBBER MODIFIER (CRM)

Crumb rubber modifier (CRM) shall consist of a combination of scrap tire CRM and high natural CRM. The scrap tire CRM shall consist of ground or granulated rubber derived from a combination of automobile tires, truck tires or tire buffings. The high natural CRM shall consist of ground or granulated rubber derived from materials that utilize high natural rubber sources.

Steel and fiber separation may be accomplished by any method. Cryogenic separation, if utilized, shall be performed separately from and prior to grinding or granulating.

CRM shall be ground or granulated at ambient temperature. Cryogenically produced CRM particles that can pass through the grinder or granulator without being ground or granulated respectively shall not be used.

CRM shall not contain more than 0.01 percent wire (by weight of CRM) and shall be free of other contaminants, except fabric. Fabric shall not exceed 0.05 percent by weight of CRM. The test and method for determining the percent by weight of wire and fabric is available at the Transportation Laboratory, Pavement Branch, Telephone (916) 227-7300, and will be furnished to interested persons upon request. A Certificate of Compliance certifying these percentages shall be furnished to the Engineer in conformance with the provisions in Section 6-1.07, "Certificates of Compliance," of the Standard Specifications.

The length of an individual CRM particle shall not exceed 3/16 inch.

The CRM shall be sufficiently dry so as to be free flowing and not produce foaming when combined with the blended paving asphalt and asphalt modifier mixture. Calcium carbonate or talc may be added at a maximum amount of 3 percent by weight of CRM to prevent CRM particles from sticking together. The CRM shall have a specific gravity between 1.1 and 1.2 as determined in conformance with the requirements in California Test 208. Scrap tire CRM and high natural CRM shall be delivered to the production site in separate bags and shall be sampled and tested separately. CRM material shall conform to the following requirements in conformance with the requirements in ASTM Designation: D 297:

SCRAP TIRE CRUMB RUBBER MODIFIER

Test Parameter	Percent	
	Min.	Max.
Acetone Extract	6.0	16.0
Ash Content	—	8.0
Carbon Black Content	28.0	38.0
Rubber Hydrocarbon	42.0	65.0
Natural Rubber Content	22.0	39.0

HIGH NATURAL CRUMB RUBBER MODIFIER

Test Parameter	Percent	
	Min.	Max.
Acetone Extract	4.0	16.0
Rubber Hydrocarbon	50.0	—
Natural Rubber Content	40.0	48.0

The CRM for asphalt-rubber binder shall conform to the gradations specified below when tested in conformance with the requirements in ASTM Designation: C 136, except as follows:

- A. Split or quarter 100 g \pm 5 g from the CRM sample and dry to a constant mass at a temperature of not less than 57°C or more than 63°C and record the dry sample mass. Place the CRM sample and 5.0 g of talc in a 0.5-L jar. Seal the jar, then shake it by hand for a minimum of one minute to mix the CRM and the talc. Continue shaking or open the jar and stir until particle agglomerates and clumps are broken and the talc is uniformly mixed.
- B. Place one rubber ball on each sieve. Each ball shall have a mass of 8.5 g \pm 0.5 g, have a diameter of 24.5 mm \pm 0.5 mm, and shall have a Shore Durometer "A" hardness of 50 \pm 5 in conformance with the requirements in ASTM Designation: D 2240. After sieving the combined material for 10 minutes \pm 1 minute, disassemble the sieves. Material adhering to the bottom of a sieve shall be brushed into the next finer sieve. Weigh and record the mass of the material retained on the 2.36-mm sieve and leave this material (do not discard) on the scale or balance. Observed fabric balls shall remain on the scale or balance and shall be placed together on the side of the scale or balance to prevent the fabric balls from being covered or disturbed when placing the material from finer sieves onto the scale or balance. The material retained on the next finer sieve (2.00-mm sieve) shall be added to the scale or balance. Weigh and record that mass as the accumulative mass retained on that sieve (2.00-mm sieve). Continue weighing and recording the accumulated masses retained on the remaining sieves until the accumulated mass retained in the pan has been determined. Prior to discarding the CRM sample, separately weigh and record the total mass of fabric balls in the sample.

- C. Determine the mass of material passing the 75- μm sieve (or mass retained in the pan) by subtracting the accumulated mass retained on the 75- μm sieve from the accumulated mass retained in the pan. If the material passing the 75- μm sieve (or mass retained in the pan) has a mass of 5 g or less, cross out the recorded number for the accumulated mass retained in the pan and copy the number recorded for the accumulated mass retained on the 75- μm sieve and record that number (next to the crossed out number) as the accumulated mass retained in the pan. If the material passing the 75- μm sieve (or mass retained in the pan) has a mass greater than 5 g, cross out the recorded number for the accumulated mass retained in the pan, subtract 5 g from that number and record the difference next to the crossed out number. The adjustment to the accumulated mass retained in the pan is made to account for the 5 g of talc added to the sample. For calculation purposes, the adjusted total sample mass is the same as the adjusted accumulated mass retained in the pan. Determine the percent passing based on the adjusted total sample mass and record to the nearest 0.1 percent.

CRM GRADATIONS

Sieve Size	Scrap Tire CRM Percent Passing	High Natural CRM Percent Passing
2.36-mm	100	100
2.00-mm	98 - 100	100
1.18-mm	45 - 75	95 - 100
600- μm	2 - 20	35 - 85
300- μm	0 - 6	10 - 30
150- μm	0 - 2	0 - 4
75- μm	0	0 - 1

ASPHALT-RUBBER BINDER

Asphalt-rubber binder shall consist of a mixture of paving asphalt, asphalt modifier, and crumb rubber modifier.

At least 2 weeks before the binder's intended use, the Contractor shall furnish the Engineer 4 one-quart cans filled with the asphalt-rubber binder proposed for use on the project. The Contractor shall supply the Engineer, for approval, a binder formulation and samples of the materials to be used in the asphalt-rubber binder at least 2 weeks before construction is scheduled to begin. The binder formulations shall consist of the following information:

A. Paving Asphalt and Modifiers:

1. Source and grade of paving asphalt.
2. Source and identification (or type) of modifiers used.
3. Percentage of asphalt modifier by weight of paving asphalt.
4. Percentage of the combined blend of paving asphalt and asphalt modifier by total weight of asphalt-rubber binder to be used.
5. Laboratory test results for test parameters shown in these special provisions.

B. Crumb Rubber Modifier (CRM):

1. Source and identification (or type) of scrap tire and high natural CRM.
2. Percentage of scrap tire and high natural CRM by total weight of the asphalt-rubber blend.
3. If CRM from more than one source is used, the above information will be required for each CRM source used.
4. Laboratory test results for test parameters shown in these special provisions.

C. Asphalt-Rubber Binder:

1. Laboratory test results of the proposed blend for test parameters shown in these special provisions.
2. The minimum reaction time and temperature.

The method and equipment for combining paving asphalt, asphalt modifier, and CRM shall be so designed and accessible that the Engineer can readily determine the percentages by weight for each material being incorporated into the mixture.

The proportions of the materials, by total weight of asphalt-rubber binder, shall be 80 percent ± 2 percent combined paving asphalt and asphalt modifier, and 20 percent ± 2 percent CRM. However, the minimum amount of CRM shall not be less than 18.0 percent. Lower values which are rounded up shall not be allowed. The CRM shall be combined at the production site and shall contain 75 percent ± 2 percent scrap tire CRM and 25 percent ± 2 percent high natural CRM, by weight.

The paving asphalt and asphalt modifier shall be combined into a blended mixture that is chemically compatible with the crumb rubber modifier to be used. The blended mixture is considered to be chemically compatible when the mixture meets the provisions for asphalt-rubber binder (after reacting) of these special provisions.

The blended paving asphalt and asphalt modifier mixture and the CRM shall be combined and mixed together at the production site in a blender unit to produce a homogeneous mixture.

The temperature of the blended paving asphalt and asphalt modifier mixture shall be not less than 375° F or more than 440° F when the CRM is added. The combined materials shall be reacted for a minimum of 45 minutes after incorporation of the CRM at a temperature of not less than 375° F or more than 425° F. The temperature shall not be higher than 10° F below the actual flash point of the asphalt-rubber binder.

After reacting, the blended asphalt-rubber binder shall conform to the following requirements:

ASPHALT-RUBBER BINDER

Test Parameter	ASTM Test Method	Requirement	
		Min.	Max.
Cone Penetration @ 25°C, 1/10 mm	D 217	25	70
Resilience @ 25°C, Percent rebound	D 3407	18	—
Field Softening Point, °C	D 36	52	74
Viscosity @ 190°C, Pa • s (x10 ⁻³)	See Note	1500	4000

Note:

The viscosity test shall be conducted using a hand held Haake Viscometer Model VT-02 with Rotor 1, 24 mm in depth x 53 mm in height, or equivalent, as determined by the Engineer. The accuracy of the viscometer shall be verified by comparing the viscosity results obtained with the hand held viscometer to 3 separate calibration fluids of known viscosities ranging from 1000 to 5000 Pa • s (x10⁻³). The viscometer will be considered accurate if the values obtained are within 300 Pa • s (x10⁻³) of the known viscosity. The known viscosity value shall be based on the fluid manufacturers standard test temperature or the test temperature versus viscosity correlation table provided by the fluid manufacturer. Viscometers used on the project shall be verified to be accurate. The test method for determining the viscosity of asphalt-rubber binder using a hand held viscometer is available at the Transportation Laboratory, Pavement Branch, Telephone (916) 227-7300. The accuracy verification results shall be provided to the Engineer and shall be certified by a Certificate of Compliance. The Certificate of Compliance shall be furnished to the Engineer in conformance with the provisions in Section 6-1.07, "Certificates of Compliance," of the Standard Specifications.

The Contractor shall provide a Haake Viscometer, or equivalent, at the production site during the combining of asphalt-rubber binder materials. The Contractor shall take viscosity readings of asphalt-rubber binder from samples taken from the feed line connecting the storage and reaction tank and the asphalt concrete plant. Readings shall be taken at least every hour with no less than one reading for each batch of asphalt-rubber binder. The Contractor shall log these results including time and asphalt-rubber binder temperature, and a copy of the log shall be submitted to the Engineer on a daily basis. As determined by the Engineer, the Contractor shall either notify the Engineer at least 15 minutes prior to each test or provide the Engineer a schedule of testing times.

The reacted asphalt-rubber binder shall be maintained at a temperature of not less than 375° F nor more than 425° F.

If material in a batch of asphalt-rubber binder is not used within 4 hours after the 45-minute reaction period, heating of the material shall be discontinued. Any time the asphalt-rubber binder cools below 375° F and is reheated shall be considered a reheat cycle. The total number of reheat cycles shall not exceed 2. The material shall be uniformly reheated to a temperature of not less than 375° F nor more than 425° F prior to use. Additional scrap tire CRM may be added to the reheated binder and reacted for a minimum of 45 minutes. The cumulative amount of additional scrap tire CRM shall not exceed 10 percent of the total binder weight. Reheated asphalt-rubber binder shall conform to the provisions for blended asphalt-rubber binder.

EQUIPMENT FOR PRODUCTION OF ASPHALT-RUBBER BINDER

The Contractor shall utilize the following equipment for production of asphalt-rubber binder:

- A. An asphalt heating tank equipped to heat and maintain the blended paving asphalt and asphalt modifier mixture at the necessary temperature before blending with the CRM. This unit shall be equipped with a thermostatic heat control device and a temperature reading device and shall be accurate to within ±5° F and shall be of the recording type.

- B. A mechanical mixer for the complete, homogeneous blending of paving asphalt, asphalt modifier and CRM. Paving asphalt and asphalt modifier shall be introduced into the mixer through meters conforming to the provisions in Section 9-1.01, "Measurement of Quantities," of the Standard Specifications. The blending system shall be capable of varying the rate of delivery of paving asphalt and asphalt modifier proportionate with the delivery of CRM. During the proportioning and blending of the liquid ingredients, the temperature of paving asphalt and the asphalt modifier shall not vary more than $\pm 25^{\circ}$ F. The paving asphalt feed, the asphalt modifier feed, and CRM feed shall be equipped with devices by which the rate of feed can be determined during the proportioning operation. Meters used for proportioning individual ingredients shall be equipped with rate-of-flow indicators to show the rates of delivery and resettable totalizers so that the total amounts of liquid ingredients introduced into the mixture can be determined. The liquid and dry ingredients shall be fed directly into the mixer at a uniform and controlled rate. The rate of feed to the mixer shall not exceed that which will permit complete mixing of the materials. 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. Mixing shall continue until a homogeneous mixture of uniformly distributed and properly blended asphalt-rubber binder of unchanging appearance and consistency is produced. The Contractor shall provide a safe sampling device capable of delivering a representative sample of the completed asphalt-rubber binder of sufficient size to permit the required tests.
- C. An asphalt-rubber binder storage tank equipped with a heating system furnished with a temperature reading device to maintain the proper temperature of the asphalt-rubber binder and an internal mixing unit capable of maintaining a homogeneous mixture of blended paving asphalt, asphalt modifier and CRM.

The equipment shall be approved by the Engineer prior to use.

AGGREGATE

The aggregate for Type O rubberized asphalt concrete shall conform to the 1/2-inch maximum grading conforming to the provisions in Section 39-2.02, "Aggregate," of the Standard Specifications. California Test 205, Section D, definition of a crushed particle is revised as follows: "A particle having 2 or more fresh mechanically fractured faces shall be considered a crushed particle".

PROPORTIONING, SPREADING AND COMPACTING.

When batch type asphalt concrete plants are used to produce Type O rubberized asphalt concrete, the asphalt-rubber binder and mineral aggregate shall be proportioned by mass.

When continuous mixing type asphalt concrete plants are used to produce Type O rubberized asphalt concrete, the asphalt-rubber binder shall be proportioned by an asphalt meter of the weight flow, Coriolis effect type. The meter shall have been Type-approved by the Division of Measurement Standards prior to the start of production. The meter shall be calibrated in conformance with the provisions in California Test 109. The meter shall be interfaced with the existing continuous mixing plant controller in use on the asphalt concrete plant.

Type O rubberized asphalt concrete shall be placed only when the atmospheric and pavement surface temperatures are 55° F and above.

When the atmospheric and pavement surface temperature is 65° F or higher, the following shall apply:

- A. The temperature of the aggregate shall not be greater than 325° F at the time the asphalt-rubber binder is added to the aggregate.
- B. Type O rubberized asphalt concrete shall be spread at a temperature of not less than 280° F nor more than 325° F, measured in the mat directly behind the paving machine.
- C. The first coverage of initial or breakdown compaction shall be performed when the temperature of the Type O rubberized asphalt concrete is not less than 275° F. Breakdown compaction shall be completed before the temperature of the Type O rubberized asphalt concrete drops below 250° F.

When the atmospheric or pavement surface temperature is below 65° F, the following shall apply:

- A. The temperature of the aggregate shall be not less than 300° F nor more than 325° F at the time the asphalt-rubber binder is added to the aggregate.
- B. The Contractor shall cover loads of Type O rubberized asphalt concrete with tarpaulins. The tarpaulins shall completely cover exposed Type O rubberized asphalt concrete until the Type O rubberized asphalt concrete has been completely transferred into the asphalt concrete paver hopper or deposited on the roadbed.
- C. Type O rubberized asphalt concrete shall be spread at a temperature of not less than 290° F nor more than 325° F, measured in the mat directly behind the paving machine.

- D. The first coverage of initial or breakdown compaction shall be performed when the temperature of the Type O rubberized asphalt concrete is not less than 280° F. Breakdown compaction shall be completed before the temperature of the Type O rubberized asphalt concrete drops below 260° F.

Pneumatic tired rollers shall not be used to compact Type O rubberized asphalt concrete.

In addition to the provisions in Section 39-5.01, "Spreading Equipment," of the Standard Specifications, asphalt paving equipment shall be equipped with automatic screed controls and a sensing device or devices.

When placing asphalt concrete to the lines and grades established by the Engineer, the automatic controls shall control the longitudinal grade and transverse slope of the screed. Grade and slope references shall be furnished, installed, and maintained by the Contractor. Should the Contractor elect to use a ski device, the minimum length of the ski device shall be 30 feet. The ski device shall be a rigid one piece unit and the entire length shall be utilized in activating the sensor.

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 30 feet 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 0.01-foot tolerance. The end of the screed farthest from the previously placed mat shall be controlled in the same way it was controlled when placing the initial mat.

Should the methods and equipment furnished by the Contractor fail to produce a layer of asphalt concrete conforming to the provisions, including straightedge tolerance, of Section 39-6.03, "Compacting," of the Standard Specifications, the paving operations shall be discontinued and the Contractor shall modify the equipment or methods, or furnish substitute equipment.

Should the automatic screed controls fail to operate properly during a day's work, the Contractor may manually control 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 provisions in this section before starting another day's work.

Traffic shall not be allowed on Type O rubberized asphalt concrete until final rolling operations have been completed and sand has been applied to the surface.

Sand shall be spread on the surface of Type O rubberized asphalt concrete at a rate of one pound to 2 pounds per square yard. The exact rate will be determined by the Engineer. When ordered by the Engineer excess sand shall be removed from the pavement surface by sweeping. Sand shall be free from clay or organic material. Sand shall conform to the fine aggregate grading requirements in conformance with the provisions in Section 90-3.03, "Fine Aggregate Grading," of the Standard Specifications.

MEASUREMENT AND PAYMENT

Rubberized asphalt concrete (Type O) will be measured and paid for by the ton in the same manner specified for asphalt concrete in Section 39-8, "Measurement and Payment," of the Standard Specifications.

Full compensation for furnishing and spreading sand on the rubberized asphalt concrete surfacing and for sweeping and removing excess sand from the pavement surface shall be considered as included in the contract price paid per ton for rubberized asphalt concrete (Type O) and no separate payment will be made therefor.

10-1.21 SHOULDER RUMBLE STRIP (ASPHALT CONCRETE, GROUND-IN INDENTATIONS)

This work shall consist of constructing shoulder rumble strips by grinding indentations in new or existing asphalt concrete surfacing as shown on the plans and as specified in these special provisions.

The method and equipment for constructing ground-in indentations shall be selected by the Contractor.

Shoulder rumble strips shall not be constructed on structures or approach slabs.

Rumble strips shall be constructed within 2 inches of the required alignment. The grinding equipment 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 0.06-inch or 1/16 inch in depth or 10 percent in length and width.

Finished shoulder 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. The corrective work shall be at the Contractor's expense.

Residue shall be removed from the roadbed by use of vacuum equipment. Residue from the removal operations shall not flow across the pavement nor flow into gutters or other drainage facilities. Residue shall be removed from pavement surfaces before the residue is dispersed by action of traffic or wind.

All removed material 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.

Fog seal coat, in conformance with the provisions in Section 37-1, "Seal Coats," of the Standard Specifications, shall be applied to the areas ground.

Shoulder rumble strip (asphalt concrete, ground-in indentations) will be measured by the station along each shoulder on which the rumble strip is constructed, without deductions for gaps between the indentations.

The contract price paid per station for shoulder rumble strip (asphalt concrete, ground-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 strip (asphalt concrete, ground-in indentations), complete in place, including furnishing and applying fog seal coat to the actual ground areas, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

10-1.22 FURNISH SIGN

Signs shall be fabricated and furnished in accordance with details shown on the plans, the Traffic Sign Specifications, and these special provisions.

Traffic Sign Specifications for California sign codes are available for review at:

<http://www.dot.ca.gov/hq/traffops/signtech/signdel/specs.htm>

Traffic Sign Specifications for signs referenced with Federal MUTCD sign codes can be found in Standard Highway Signs Book, administered by the Federal Highway Administration, which is available for review at:

<http://mutcd.fhwa.dot.gov/ser-pubs.htm>

Information on cross-referencing California sign codes with the Federal MUTCD sign codes is available at:

<http://www.dot.ca.gov/hq/traffops/signtech/signdel/specs.htm>

Temporary or permanent signs shall be free from blemishes that may affect the serviceability and detract from the general sign color and appearance when viewing during daytime and nighttime from a distance of 25 feet. The face of each finished sign shall be uniform, flat, smooth, and free of defects, scratches, wrinkles, gel, hard spots, streaks, extrusion marks, and air bubbles. The front, back, and edges of the sign panels shall be free of router chatter marks, burns, sharp edges, loose rivets, delaminated skins, excessive adhesive over spray and aluminum marks.

SHEET ALUMINUM

Alloy and temper designations for sheet aluminum shall be in accordance with ASTM Designation: B 209.

The Contractor shall furnish the Engineer a Certificate of Compliance in conformance with Section 6-1.07, "Certificates of Compliance," of the Standard Specifications for the sheet aluminum.

Sheet aluminum shall be pretreated in accordance to ASTM Designation: B 449. Surface of the sheet aluminum shall be cleaned, deoxidized, and coated with a light and tightly adherent chromate conversion coating free of powdery residue. The conversion coating shall be Class 2 with a weight between 10 milligrams per square foot and 35 milligrams per square foot, and an average weight of 25 milligrams per square foot. Following the cleaning and coating process, the sheet aluminum shall be protected from exposure to grease, oils, dust, and contaminants.

Sheet aluminum shall be free of buckles, warps, dents, cockles, burrs, and defects resulting from fabrication.

Base plate for standard route marker shall be die cut.

RETROREFLECTIVE SHEETING

The Contractor shall furnish retroreflective sheeting for sign background and legend in conformance with ASTM Designation: D 4956 and "Prequalified and Tested Signing and Delineation Materials" of these special provisions.

Retroreflective sheeting shall be applied to sign panels as recommended by the retroreflective sheeting manufacturer without stretching, tearing, and damage.

Class 1, 3, or 4 adhesive backing shall be used for Type II, III, IV, VII, VIII, and IX retroreflective sheeting. Class 2 adhesive backing may also be used for Type II retroreflective sheeting. The adhesive backing shall be pressure sensitive and fungus resistant.

When the color of the retroreflective sheeting determined from instrumental testing is in dispute, the Engineer's visual test will govern.

PROCESS COLOR AND FILM

The Contractor shall furnish and apply screened process color, non-reflective opaque black film, and protective overlay film of the type, kind, and product that are approved by the manufacturer of the retroreflective sheeting.

The Contractor shall furnish the Engineer a Certificate of Compliance in accordance to Section 6-1.07, "Certificates of Compliance," of the Standard Specifications for the screened process color, non-reflective opaque black film, and protective overlay film.

The surface of the screened process color shall be flat and smooth. When the screened process colors determined from the instrumental testing in accordance to ASTM Designation: D 4956 are in dispute, the Engineer's visual test will govern.

The Contractor shall provide patterns, layouts, and set-ups necessary for the screened process.

The Contractor may use green, red, blue, and brown reverse-screened process colors for background and non-reflective opaque black film or black screened process color for legend. The coefficient of retroreflection for reverse-screened process colors on white retroreflective sheeting shall not be less than 70 percent of the coefficient of retroreflection specified in ASTM Designation: D 4956.

The screened process colors and non-reflective opaque black film shall have the same outdoor weatherability as that of the retroreflective sheeting.

After curing, screened process colors shall withstand removal when tested by applying 3M Company Scotch Brand Cellophane Tape No. 600 or equivalent tape over the color and removing with one quick motion at 90° angle.

SINGLE SHEET ALUMINUM SIGN

Single sheet aluminum signs shall be fabricated and furnished with or without frame. The Contractor shall furnish the sheet aluminum in accordance to "Sheet Aluminum" of these special provisions. Single sheet aluminum signs shall be fabricated from sheet aluminum alloy 6061-T6 or 5052-H38.

Single Sheet aluminum signs shall not have a vertical splice in the sheet aluminum. For signs with depth greater than 48 inches, one horizontal splice will be allowed in the sheet aluminum.

Framing for single sheet aluminum signs shall consist of aluminum channel or rectangular aluminum tubing. The framing shall have a length tolerance of $\pm 1/8$ inch. The face sheet shall be affixed to the frame with rivets of 3/16-inch diameter. Rivets shall be placed within the web of channels and shall not be placed less than 1/2 inch from edges of the sign panels. Rivets shall be made of aluminum alloy 5052 and shall be anodized or treated with conversion coating to prevent corrosion. The exposed portion of rivets on the face of signs shall be the same color as the background or legend where the rivets are placed.

Finished signs shall be flat within a tolerance of $\pm 1/32$ inch per linear foot when measured across the plane of the sign in all directions. The finished signs shall have an overall tolerance within $\pm 1/8$ inch of the detailed dimensions.

Aluminum channels or rectangular aluminum tubings shall be welded together with the inert gas shielded-arc welding process using E4043 aluminum electrode filler wires as shown on the plans. Width of the filler shall be equal to wall thickness of smallest welded channel or tubing.

FIBERGLASS REINFORCED PLASTIC PANEL SIGN

The Contractor shall furnish fiberglass reinforced plastic panel sign in accordance with ASTM Designation: D 3841 and "Prequalified and Tested Signing and Delineation Materials" of these special provisions.

Fiberglass reinforced plastic shall be acrylic modified and ultraviolet stabilized for outdoor weatherability. The plastic shall contain additives designed to suppress fire ignition and flame propagation. When tested in accordance with the requirements in the ASTM Designation: D 635, the extent of burning shall not exceed one inch.

Fiberglass reinforced plastic shall be stabilized to prevent the release solvents and monomers. The front and back surfaces of the laminate shall be clean and free of constituents and releasing agents that can interfere with the bonding of retroreflective sheeting.

The fiberglass reinforced plastic panel sign shall be weather resistant Grade II thermoset polyester laminate.

The fiberglass reinforced plastic panels shall be minimum 0.135-inch thick. Finished fiberglass reinforced plastic panel signs shall be flat within a tolerance of $\pm 1/32$ inch per linear foot when measured across the plane of the sign in all directions. The finished signs shall have an overall tolerance within $\pm 1/8$ inch of the specified dimensions.

Color of fiberglass reinforced plastic panels shall be uniform gray within Munsell color range of N7.5 to N8.5.

Fiberglass reinforced plastic panels shall be cut from a single piece of laminate. Bolt holes shall be predrilled. The predrilled bolt holes, panel edges, and the front and back surfaces of the panels shall be true and smooth. The panel surfaces shall be free of visible cracks, pinholes, foreign inclusions, warping and wrinkles that can affect performance and serviceability.

10-1.23 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.

10-1.235 ALTERNATIVE FLARED TERMINAL SYSTEM

Alternative flared terminal system shall be furnished and installed as shown on the plans and in conformance with these special provisions.

The allowable alternatives for a flared terminal system shall consist of one of the following or a Department approved equal.

- A. **TERMINAL SYSTEM (TYPE FLEAT)** - Terminal system (Type FLEAT) shall be a Flared Energy Absorbing Terminal 350 manufactured by Road Systems, Inc., located in Big Spring, Texas, and shall include items detailed for terminal system (Type FLEAT) shown on the plans. The Flared Energy Absorbing Terminal 350 can be obtained from the distributor, Universal Industrial Sales, P.O. Box 699, Pleasant Grove, UT 84062, telephone (801) 785-0505 or from the distributor, Gregory Highway Products, 4100 13th Street, S.W., Canton, OH 44708, telephone (330) 477-4800.
- B. **TERMINAL SYSTEM (TYPE SRT)** - Terminal system (Type SRT) shall be an SRT-350 Slotted Rail Terminal (8-post system) as manufactured by Trinity Industries, Inc., and shall include items detailed for terminal system (Type SRT) shown on the plans. The SRT-350 Slotted Rail Terminal (8-post system) can be obtained from the manufacturer, Trinity Industries, Inc., P.O. Box 99, 950 West 400S, Centerville, UT 84014, telephone (800) 772-7976.

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 the terminal systems furnished 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.

Terminal systems shall be installed in conformance with the manufacturer's installation instructions and these requirements. Each terminal system installed shall be identified by painting the type of terminal system in neat black letters and figures 2 inches high on the backside of the rail element between system posts numbers 4 and 5.

For terminal system (Type SRT), 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 4 inches thick and each layer shall be moistened and thoroughly compacted. The wood terminal posts shall be inserted into the steel foundation tubes by hand and shall not be driven. 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 149° F or less. The edges of the wood terminal posts may be slightly rounded to facilitate insertion of the post into the steel foundation tubes.

For terminal system (Type FLEAT), the soil tubes shall be, at the Contractor's option, 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 4 inches thick and each layer shall be moistened and thoroughly compacted. Wood 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 149° F or less. The edges of the wood posts may be slightly rounded to facilitate insertion of the post into the steel foundation tubes.

Surplus excavated material remaining after the terminal system has been installed shall be disposed of in a uniform manner along the adjacent roadway where designated by the Engineer.

The contract unit price paid for alternative flared terminal system shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in furnishing and installing alternative flared terminal system, complete in place, including excavation, backfill and disposal of surplus material, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

10-1.24 TRANSITION RAILING (TYPE WB)

Transition railing (Type WB) shall be furnished and installed in conformance with details shown on the plans, the provisions in Section 83-2, "Barriers," of the Standard Specifications and these special provisions.

The 10-gage rail elements shall conform to the requirements of Class B, Type 1 three beam guard railing as shown in AASHTO Designation: M 180. End caps shall conform to the requirements of Class A, Type 1 three beam guard railing as shown in AASHTO Designation: M 180.

Surplus excavated material remaining after the transitional railing (Type WB) has been constructed shall be disposed of in a uniform manner along the adjacent roadway where designated by the Engineer.

The contract unit price paid for transition railing (Type WB) shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in furnishing and installing transition railing (Type WB), complete in place, including drilling holes for wood posts, driving posts, backfill, and disposal of surplus material, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

10-1.25 THERMOPLASTIC TRAFFIC STRIPE AND PAVEMENT MARKING

Thermoplastic traffic stripes (traffic lines) and 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 m⁻² lx⁻¹. Yellow thermoplastic traffic stripes and pavement markings shall have a minimum initial retroreflectivity of 150 mcd m⁻² lx⁻¹.

Where striping joins existing striping, as shown on the plans, the Contractor shall begin and end the transition from the existing striping pattern into or from the new striping pattern a sufficient distance to ensure continuity of the striping pattern.

Thermoplastic traffic stripes shall be applied at the minimum thickness and application rate as specified below. The minimum application rate is based on a solid stripe of 4 inches in width.

Minimum Stripe Thickness (inch)	Minimum Application Rate (lb/ft)
0.098	0.34

Thermoplastic traffic stripes and pavement markings shall be free of runs, bubbles, craters, drag marks, stretch marks, and debris.

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 thermoplastic traffic stripes and 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 traffic stripes and pavement markings, the tape will be measured and paid for by the linear foot as thermoplastic traffic stripe and by the square foot as thermoplastic pavement marking.

10-1.26 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.

Attention is directed to "Traffic Control System For Lane Closure" of these special provisions regarding the use of moving lane closures during placement of pavement markers with bituminous adhesive.

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

Inductive loop detector shall conform to the provisions in Section 86, "Signals, Lighting and Electrical Systems," of the Standard Specifications and these special provisions.

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 CONDUCTORS AND WIRING

Splices shall be insulated by "Method B" .

The minimum insulation thickness, at any point, for Type USE, RHH or RHW wire shall be 39 mils for conductor sizes No. 14 to No. 10, inclusive, and 51 mils for No. 8 to No. 2, inclusive. The minimum insulation thickness, at any point, for Type THW and TW wires shall be 27 mils for conductor sizes No. 14 to No. 10, inclusive, 40 mils for No. 8, and 54 mils for No. 6 to No. 2, inclusive.

Conductors shall be pulled into conduit by using a flat, woven, lubricated, soft-fiber polyester tape having a minimum tensile strength of 8000 N and printed sequential measurement markings at least every meter.

10-3.04 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 3/16-inch 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 3/16-inch 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.

Bonding of metallic conduits in metal pull boxes shall be by means of bonding bushings and bonding jumpers connected to the bonding wire running in the conduit system.

10-3.05 DETECTORS

Loop wire shall be Type 2.

Loops shall be installed prior to any pavement grinding. Top of loops shall be a minimum of 126 mm below finished grade.

Slots shall be filled with elastomeric sealant hot-melt rubberized asphalt sealant, except when dense graded asphalt concrete surfacing will be placed over insulated loop conductors, asphalt emulsion sealant may be used.

10-3.06 DETECTORS HANDHOLES

Detector handhole covers shall be secured with two 5/16" x 1 1/2" screws which shall be of brass, stainless steel or other non-corroding metal material.

Detector handholes shall be installed prior to any pavement grinding. Detector handhole covers shall be 50 mm below finished grade.