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STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

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**NOTICE TO CONTRACTORS  
AND  
SPECIAL PROVISIONS**

**FOR CONSTRUCTION ON STATE HIGHWAY IN  
SANTA BARBARA COUNTY IN AND NEAR SANTA BARBARA AT VARIOUS LOCATIONS FROM LAS  
POSITAS OVERCROSSING TO CASTILLO STREET UNDERCROSSING**

**DISTRICT 05, ROUTE 225**

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**For Use in Connection with Standard Specifications Dated JULY 1999, Standard Plans Dated JULY 2004 and Labor  
Surcharge and Equipment Rental Rates.**

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**CONTRACT NO. 05-487724**

**05-SB-225-0.0/6.8**

**Bids Open: August 1, 2007  
Dated: June 25, 2007**

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# IMPORTANT SPECIAL NOTICES

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- 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 (A-L)
A10B	Acronyms and Abbreviations (M-Z)
A10C	Symbols (Sheet 1 of 2)
A10D	Symbols (Sheet 2 of 2)
A62A	Excavation and Backfill – Miscellaneous Details
A62D	Excavation and Backfill – Concrete Pipe Culverts
A62DA	Excavation and Backfill – Concrete Pipe Culverts
A62F	Excavation and Backfill – Metal And Plastic Culverts
A77A1	Metal Beam Guard Railing – Standard Railing Section (Wood Post With Wood Block)
A77B1	Metal Beam Guard Railing – Standard Hardware
A77C1	Metal Beam Guard Railing – Wood Post and Wood Block Details
A77C3	Metal Beam Guard Railing – Typical Line Post Embedment and Hinge Point Offset Details
A77L1	Metal Beam Railing Terminal System (Type SRT)
A85	Chain Link Fence
A87A	Curbs and Driveways
RSP A88A	Curb Ramp Details
RSP A88B	Curb Ramp and Island Passageway Details
D72	Drainage Inlets
D73	Drainage Inlets
D74A	Drainage Inlets
D74B	Drainage Inlets
D74C	Drainage Inlets Details
D75A	Pipe Inlets
D75B	Pipe Inlets
D75C	Pipe Inlets
D77A	Grate Details
D77B	Bicycle Proof Grate Details
D77C	Alternative Hinged Cover for Type OL And OS Inlets and Trash Rack for Type OCP Inlet
D79	Precast Reinforced Concrete Pipe – Direct Design Method
D97H	Reinforced Concrete Pipe or Non-Reinforced Concrete Pipe-Standard and Positive Joints
H1	Planting and Irrigation – Abbreviations
T1A	Temporary Crash Cushion, Sand Filled (Unidirectional)
T1B	Temporary Crash Cushion, Sand Filled (Bidirectional)
T2	Temporary Crash Cushion, Sand Filled (Shoulder Installations)
T3	Temporary Railing (Type K)
RSP T7	Construction Project Funding Identification Signs
RSP T11	Traffic Control System for Lane Closure On Multilane Conventional Highways
RSP T12	Traffic Control System for Lane Closure On Multilane Conventional Highways
T59	Temporary Water Pollution Control Details (Temporary Concrete Washout Facility)
RS1	Roadside Signs, Typical Installation Details No. 1
RS2	Roadside Signs - Wood Post, Typical Installation Details No. 2
RS3	Roadside Signs - Laminated Wood Box Post Typical Installation Details No. 3
RS4	Roadside Signs, Typical Installation Details No. 4
S93	Framing Details for Framed Single Sheet Aluminum Signs, Rectangular Shape
S94	Roadside Single Sheet Aluminum Sign, Rectangular Shape
S95	Roadside Single Sheet Aluminum Sign, Diamond Shape
ES-1A	Electrical Systems (Symbols And Abbreviations)
ES-1B	Electrical Systems (Symbols And Abbreviations)
ES-1C	Electrical Systems (Symbols And Abbreviations)

ES-2A	Electrical Systems (Service Equipment)
ES-2C	Electrical Systems (Service Equipment Notes, Type III Series)
ES-2F	Electrical Systems (Service Equipment and Typical Wiring Diagram Type III – C Series)
ES-3C	Electrical Systems (Controller Cabinet Details)
ES-4A	Electrical Systems (Signal Heads And Mountings)
ES-4B	Electrical Systems (Signal Heads And Mountings)
ES-4C	Electrical Systems (Signal Heads And Mountings)
ES-4D	Electrical Systems (Signal Heads And Mountings)
ES-4E	Electrical Systems (Signal Faces And Mountings)
ES-5A	Electrical Systems (Detectors)
ES-5B	Electrical Systems (Detectors)
ES-5C	Electrical Systems (Detectors)
ES-5D	Electrical Systems (Detectors)
ES-6A	Electrical Systems (Lighting Standards Types 15 and 21)
RSP ES-7A	Electrical Systems (Signal Standards Push Button Posts and Type 15TS Standard))
ES-7B	Electrical Systems (Signal And Lighting Standards – Type 1 Standards and Equipment Numbering)
RSP ES-7D	Electrical Systems (Signal and Lighting Standards – Case 2 Arm Loading, Wind Velocity = 161 km/h, Arm Lengths 4.6 m to 9.1 m)
RSP ES-7M	Electrical Systems (Signal and Lighting Standards – Details No. 1)
ES-7N	Electrical Systems (Signal and Lighting Standards – Details No. 2)
ES-8	Electrical Systems (Pull Box Details)
ES-10	Electrical Systems (Isolux Diagrams)
ES-11	Electrical Systems (Foundation Installations)
ES-13A	Electrical Systems (Splicing Details)
ES-13B	Electrical Systems (Wiring Details and Fuse Ratings)

**DEPARTMENT OF TRANSPORTATION**

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**NOTICE TO CONTRACTORS**

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**CONTRACT NO. 05-487724**

**05-SB-225-0.0/6.8**

Sealed proposals for the work shown on the plans entitled:

**STATE OF CALIFORNIA; DEPARTMENT OF TRANSPORTATION; PROJECT PLANS FOR CONSTRUCTION ON STATE HIGHWAY IN SANTA BARBARA COUNTY IN AND NEAR SANTA BARBARA AT VARIOUS LOCATIONS FROM LAS POSITAS OVERCROSSING TO CASTILLO STREET UNDERCROSSING**

will be received at the Department of Transportation, 1120 N Street, Room 0200, MS #26, Sacramento, CA 95814, until 2 o'clock p.m. on August 1, 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 SANTA BARBARA COUNTY IN AND NEAR SANTA BARBARA AT VARIOUS LOCATIONS FROM LAS POSITAS OVERCROSSING TO CASTILLO STREET UNDERCROSSING**

General work description: Construct sidewalks and curb ramps.

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 any combination of the following Class C licenses which constitutes a majority of the work: C-8, C-12, C-61,

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.

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 Caltrans Central Region Construction Office is located at 855 M Street, Suite 200, Fresno, CA 93721. The District Duty Senior for this project can be reached at (805) 549-3116, or by fax at (805) 549-3523. The Department will consider bidder inquiries only when a completed "Bidder Inquiry" form is submitted. The "Bidder Inquiry" form is available on the Internet at:

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

Contract No. 05-487724

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

<http://www.dot.ca.gov/dist5/construction>

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

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 June 25, 2007

BP

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

**05-487724**

Item No.	Item Code	Item Description	Unit of Measure	Estimated Quantity
1	074019	PREPARE STORM WATER POLLUTION PREVENTION PLAN	LS	LUMP SUM
2	074020	WATER POLLUTION CONTROL	LS	LUMP SUM
3	074042	TEMPORARY CONCRETE WASHOUT (PORTABLE)	LS	LUMP SUM
4 (S)	120090	CONSTRUCTION AREA SIGNS	LS	LUMP SUM
5 (S)	120100	TRAFFIC CONTROL SYSTEM	LS	LUMP SUM
6 (S)	128650	PORTABLE CHANGEABLE MESSAGE SIGN	LS	LUMP SUM
7	150605	REMOVE FENCE	M	34
8	150742	REMOVE ROADSIDE SIGN	EA	1
9	150769	REMOVE ASPHALT CONCRETE	M2	210
10	150771	REMOVE ASPHALT CONCRETE DIKE	M	58
11	150805	REMOVE CULVERT	M	2
12	150820	REMOVE INLET	EA	1
13	150821	REMOVE HEADWALL	EA	1
14	150823	REMOVE DOWNDRAIN	EA	6
15	150834	REMOVE RETAINING WALL (WOOD)	M	2
16	151540	RECONSTRUCT CHAIN LINK FENCE	M	110
17	151554	RECONSTRUCT CHAIN LINK GATE	EA	3
18	151572	RECONSTRUCT METAL BEAM GUARD RAILING	M	5
19	152255	RESET MAILBOX	EA	10
20	152320	RESET ROADSIDE SIGN	EA	36

Item No.	Item Code	Item Description	Unit of Measure	Estimated Quantity
21	152439	ADJUST FRAME AND GRATE TO GRADE	EA	5
22	153210	REMOVE CONCRETE	M3	130
23	153220	REMOVE CONCRETE (CHANNEL)	M3	42
24	160101	CLEARING AND GRUBBING	LS	LUMP SUM
25	010939	PRUNE EXISTING TREE ROOTS	EA	5
26	160120	REMOVE TREE	EA	1
27	190101	ROADWAY EXCAVATION	M3	340
28	198001	IMPORTED BORROW	M3	220
29 (S)	200001	HIGHWAY PLANTING	LS	LUMP SUM
30 (S)	203014	FIBER (EROSION CONTROL)	KG	210
31 (S)	203024	COMPOST (EROSION CONTROL)	M3	0.5
32 (S)	203045	PURE LIVE SEED (EROSION CONTROL)	KG	3.9
33 (S)	203061	STABILIZING EMULSION (EROSION CONTROL)	KG	13
34 (S)	204099	PLANT ESTABLISHMENT WORK	LS	LUMP SUM
35	010940	ROOT BARRIER	M	25
36	010941	GRIND EXISTING CONCRETE LIP	M2	2
37	010942	GRIND EXISTING ASPHALT CONCRETE	M2	3
38 (F)	510502	MINOR CONCRETE (MINOR STRUCTURE)	M3	13.5
39	560232	FURNISH FORMED PANEL SIGN (ROADSIDE)	M2	0.5
40	566012	ROADSIDE SIGN - TWO POST	EA	1

Item No.	Item Code	Item Description	Unit of Measure	Estimated Quantity
41	597401	PAINT CURB (2-COAT)	M	160
42	620908	375 MM ALTERNATIVE PIPE CULVERT	M	9
43	620909	450 MM ALTERNATIVE PIPE CULVERT	M	103
44	620913	600 MM ALTERNATIVE PIPE CULVERT	M	13
45	664008	300 MM CORRUGATED STEEL PIPE	M	19
46	700617	DRAINAGE INLET MARKER	EA	11
47	707133	900 MM PRECAST CONCRETE PIPE INLET	M	5
48	731502	MINOR CONCRETE (MISCELLANEOUS CONSTRUCTION)	M3	570
49 (S-F)	750001	MISCELLANEOUS IRON AND STEEL	KG	1291
50 (S)	861497	MODIFY SIGNAL AND LIGHTING (LOCATION 1)	LS	LUMP SUM
51 (S)	861498	MODIFY SIGNAL AND LIGHTING (LOCATION 2)	LS	LUMP SUM
52 (S)	861499	MODIFY SIGNAL AND LIGHTING (LOCATION 3)	LS	LUMP SUM
53 (S)	861500	MODIFY SIGNAL AND LIGHTING (LOCATION 4)	LS	LUMP SUM
54 (S)	861503	MODIFY LIGHTING	LS	LUMP SUM
55 (S)	861505	MODIFY SIGNAL AND LIGHTING (LOCATION 5)	LS	LUMP SUM
56 (S)	010943	EMERGENCY VEHICLE DETECTOR SYSTEM	LS	LUMP SUM
57	999990	MOBILIZATION	LS	LUMP SUM

**STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION**

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**SPECIAL PROVISIONS**

**Annexed to Contract No. 05-487724**

**SECTION 1. SPECIFICATIONS AND PLANS**

The work embraced herein shall conform to the provisions in the Standard Specifications dated July 1999, and the Standard Plans dated July 2004, 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 NOVEMBER 3, 2006**

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: October 6, 2006

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

Contract No. 05-487724

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.
- A list in the specifications is inclusive unless the items listed 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: November 3, 2006

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

B. 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.

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: October 6, 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. No inspection by the State is 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

- The Contractor shall ensure that all of its subcontractors carry sufficient insurance coverage that the Contractor deems adequate based on the size, duration, and hazards of the subcontracted work.

**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 <sup>1</sup>	Aggregate for Products/Completed Operation	General Aggregate <sup>2</sup>	Umbrella or Excess Liability <sup>3</sup>
≤\$25,000,000	\$1,000,000	\$2,000,000	\$2,000,000	\$5,000,000
>\$25,000,000	\$1,000,000	\$2,000,000	\$2,000,000	\$15,000,000
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 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:

#### **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 49: PILING**

Issue Date: May 1, 2006

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.

**SECTION 51: CONCRETE STRUCTURES**

Issue Date: September 15, 2006

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 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 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 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)
$H \leq 30$	20
$30 < H \leq 50$	25
$50 < H \leq 100$	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 55: STEEL STRUCTURES**

Issue Date: May 1, 2006

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

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

The third paragraph of 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 polysulfide or polyurethane caulking conforming to the requirements in ASTM Designation: C 920, Type S, Grade NS, Class 25, Use M, to contact areas to provide full bedding.

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

- 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 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 75: MISCELLANEOUS METAL**

Issue Date: May 1, 2006

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.

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

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

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 86: SIGNALS, LIGHTING AND ELECTRICAL SYSTEMS**

Issue Date: October 6, 2006

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."

## **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: November 3, 2006

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 <sup>a</sup>	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 % <sup>b</sup>	T 44	99	99	99	99	99
Viscosity at 135°C, <sup>c</sup> 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, <sup>e</sup> 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 <sup>f</sup> 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 <sup>d</sup> 5000	31 <sup>d</sup> 5000	28 <sup>d</sup> 5000	22 <sup>d</sup> 5000	34 <sup>d</sup> 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 <sup>a</sup>

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 % <sup>b</sup>	T 44 <sup>c</sup>	98.5	98.5	98.5
Viscosity at 135°C, <sup>d</sup> 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	0.60	0.60	0.60
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 <sup>f</sup> , Test Temp., °C Minimum recovery, %	T 301	25 75	25 75	25 65
PAV <sup>g</sup> 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:

- Do not modify PG Polymer Modified using acid modification.
- The Engineer waives this specification if the supplier is a Quality Supplier as defined by the Department's "Certification Program for Suppliers of Asphalt."
- The Department allows ASTM D 5546 instead of AASHTO T 44
- The Engineer waives this specification if the supplier certifies the asphalt binder can be adequately pumped and mixed at temperatures meeting applicable safety standards.
- 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.
- Tests without a force ductility clamp may be performed.
- "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, Central Region Construction, P.O. Box 12616, Fresno, CA 93778, so that the request is received by the Department by close of business on the fourth 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**

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

The Contractor shall furnish the Engineer with a statement from the vendor that the order for the sign panels and electrical materials required for this contract has been received and accepted by the vendor; and the statement shall be furnished within 15 calendar days after the contract has been approved by the Attorney General, or the attorney appointed and authorized to represent the Department of Transportation. The statement shall give the dates that the sign panels and electrical materials will be shipped. If the Contractor has the necessary materials on hand, the Contractor will not be required to furnish the vendor's statement.

The Contractor shall begin work within 120 calendar days after the contract has been approved by the Attorney General or the attorney appointed and authorized to represent the Department of Transportation.

The work (except plant establishment work) shall be diligently prosecuted to completion before the expiration of **80 WORKING DAYS** beginning on the date that work begins, or beginning on the one hundred twentieth calendar day after approval of the contract, whichever occurs first.

The Contractor shall pay to the State of California the sum of \$ 2,400 per day, for each and every calendar day's delay in finishing the work (except plant establishment work) in excess of the number of working days prescribed above.

The Contractor shall diligently prosecute all work (including plant establishment) to completion before the expiration of **200 WORKING DAYS** beginning on the date that work begins, or beginning on the one hundred twentieth calendar day after approval of the contract.

The Contractor shall pay to the State of California the sum of \$600 per day, for each and every calendar day's delay in completing the work in excess of **200 WORKING DAYS**.

In no case will liquidated damages of more than \$ 2,400 per day be assessed.

The 72 hours advance notice before beginning work specified in Section 8-1.03, "Beginning of Work," of the Standard Specifications is changed to 5 days advance notice for this project.

## **SECTION 5. GENERAL**

### **SECTION 5-1. MISCELLANEOUS**

#### **5-1.01 PLANS AND WORKING DRAWINGS**

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

#### **5-1.013 LINES AND GRADES**

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

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

#### **5-1.017 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 therefrom.

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 \$5000 or more.

### **5-1.022 PAYMENT OF WITHHELD FUNDS**

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

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

### **5-1.03 INTEREST ON PAYMENTS**

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

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

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

### **5-1.04 PUBLIC SAFETY**

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

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

- A. Excavations—The near edge of the excavation is 3.6 m or less from the edge of the lane, except:
  1. Excavations covered with sheet steel or concrete covers of adequate thickness to prevent accidental entry by traffic or the public.
  2. Excavations less than 0.3-m deep.
  3. Trenches less than 0.3-m wide for irrigation pipe or electrical conduit, or excavations less than 0.3-m in diameter.
  4. Excavations parallel to the lane for the purpose of pavement widening or reconstruction.
  5. Excavations in side slopes, where the slope is steeper than 1:4 (vertical:horizontal).
  6. Excavations protected by existing barrier or railing.
- B. Temporarily Unprotected Permanent Obstacles—The work includes the installation of a fixed obstacle together with a protective system, such as a sign structure together with protective railing, and the Contractor elects to install the obstacle prior to installing the protective system; or the Contractor, for the Contractor's convenience and with permission of the Engineer, removes a portion of an existing protective railing at an obstacle and does not replace such railing complete in place during the same day.
- C. Storage Areas—Material or equipment is stored within 3.6 m of the lane and the storage is not otherwise prohibited by the provisions of the Standard Specifications and these special provisions.

The approach end of temporary railing (Type K), installed in conformance with the provisions in this section "Public Safety" and in Section 7-1.09, "Public Safety," of the Standard Specifications, shall be offset a minimum of 4.6 m from the edge of the traffic lane open to public traffic. The temporary railing shall be installed on a skew toward the edge of the traffic lane of not more than 0.3-m transversely to 3 m longitudinally with respect to the edge of the traffic lane. If the 4.6-m minimum offset cannot be achieved, the temporary railing shall be installed on the 10 to 1 skew to obtain the maximum available offset between the approach end of the railing and the edge of the traffic lane, and an array of temporary crash cushion modules shall be installed at the approach end of the temporary railing.

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

Approach Speed of Public Traffic (Posted Limit) (Kilometers Per Hour)	Work Areas
Over 72 (45 Miles Per Hour)	Within 1.8 m of a traffic lane but not on a traffic lane
56 to 72 (35 to 45 Miles Per Hour)	Within 0.9-m of a traffic lane but not on a traffic lane

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

When traffic cones or delineators are used to delineate a temporary edge of a traffic lane, the line of cones or delineators shall be considered to be the edge of the traffic lane, however, the Contractor shall not reduce the width of an existing lane to less than 3 m without written approval from the Engineer.

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

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

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

#### **5-1.05 TESTING**

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

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

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

#### **5-1.06 REMOVAL OF ASBESTOS AND HAZARDOUS SUBSTANCES**

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

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

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

#### **5-1.065 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 from the following website:

<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.

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 six categories of costs of work during the life of the contract:

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

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

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

### **5-1.104 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 on the Internet at:

[http://www.dot.ca.gov/hq/construc/ewb/EWB\\_INSTRUCTION.pdf](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 18.5 meter 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 18.5 meter 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.

#### **5-1.12 AREAS FOR CONTRACTOR'S USE**

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

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

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

No area is available within the contract limits for the exclusive use of the Contractor. However, temporary storage of equipment and materials on State property may be arranged with the Engineer, subject to the prior demands of State maintenance forces and to other contract requirements. Use of the Contractor's work areas and other State-owned property shall be at the Contractor's own risk, and the State shall not be held liable for damage to or loss of materials or equipment located within such areas.

#### **5-1.13 PAYMENTS**

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

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

- |                          |             |
|--------------------------|-------------|
| A. Clearing and Grubbing | \$15,000.00 |
|--------------------------|-------------|

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

No partial payment will be made for any materials on hand which are furnished but not incorporated in the work.

#### **5-1.14 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 attached to the project plans is as follows:

A. Installation Details for State-furnished Battery Backup System.

Cross sections are available in paper or electronic copy.

The District Office in which the work is situated is located at 50 Higuera Street, San Luis Obispo, CA 93401.

#### **5-1.15 SOUND CONTROL REQUIREMENTS**

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

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

The noise level requirement shall apply to the equipment on the job or related to the job, including but not limited to trucks, transit mixers or transient equipment that may or may not be owned by the Contractor. The use of loud sound signals shall be avoided in favor of light warnings except those required by safety laws for the protection of personnel.

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

#### **5-1.16 ENVIRONMENTALLY SENSITIVE AREA**

An environmentally sensitive area (ESA) shall consist of an area within and near the limits of construction where access is prohibited or limited for the preservation of archeological site or existing vegetation, or protection of biological habitat as shown on the plans. The Engineer will determine the exact location of the boundaries of the ESA. No work shall be conducted within the ESA.

Attention is directed to Section 7-1.01 "Laws to be Observed," and Section 7—1.04 "Permits and Licenses," of the Standard Specifications regarding State and Federal regulations, permits, or agreements which pertain to an ESA.

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

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

#### **5-1.17 PRESERVATION OF PROPERTY**

Attention is directed to Section 7-1.11, "Preservation of Property," of the Standard Specifications and these special provisions.

Existing trees, shrubs and other plants, that are not to be removed as shown on the plans or specified in these special provisions, and are injured or damaged by reason of the Contractor's operations, shall be replaced by the Contractor. The minimum size of tree replacement shall be 600 mm box and the minimum size of shrub replacement shall be No. 15 container. Replacement ground cover plants shall be from flats and shall be planted 300 mm on center. Replacement of *Carpobrotus* ground cover plants shall be from cuttings and shall be planted 300 mm on center. Replacement planting shall conform to the requirements in Section 20-4.07, "Replacement," of the Standard Specifications. The Contractor shall water replacement plants in conformance with the provisions in Section 20-4.06, "Watering," of the Standard Specifications.

Damaged or injured plants shall be removed and disposed of outside the highway right of way in conformance with the provisions in Section 7-1.13 of the Standard Specifications. At the option of the Contractor, removed trees and shrubs may be reduced to chips. The chipped material shall be spread within the highway right of way at locations designated by the Engineer.

Replacement planting of injured or damaged trees, shrubs, and other plants shall be completed prior to the start of the plant establishment period. Replacement planting shall conform to the provisions in Section 20-4.05, "Planting," of the Standard Specifications.

**5-1.18 RELIEF FROM MAINTENANCE AND RESPONSIBILITY**

The Contractor may be relieved of the duty of maintenance and protection for those items not directly connected with plant establishment work in conformance with the provisions in Section 7-1.15, "Relief From Maintenance and Responsibility," of the Standard Specifications. Water pollution control, maintain existing planted areas, maintain existing irrigation facilities, transplant trees, and transplant palm trees shall not be relieved of maintenance.

**SECTION 6. (BLANK)**

**SECTION 7. (BLANK)**

**SECTION 8. MATERIALS**

**SECTION 8-1. MISCELLANEOUS**

**8-1.01 SUBSTITUTION OF NON-METRIC MATERIALS AND PRODUCTS**

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

- A. Materials and products shown on the plans or in the special provisions as being equivalent may be substituted for the metric materials and products specified or detailed on the plans.
- B. Before other non-metric materials and products will be considered for use, the Contractor shall furnish, at the Contractor's expense, evidence satisfactory to the Engineer that the materials and products proposed for use are equal to or better than the materials and products specified or detailed on the plans. The burden of proof as to the quality and suitability of substitutions shall be upon the Contractor and the Contractor shall furnish necessary information as required by the Engineer. The Engineer will be the sole judge as to the quality and suitability of the substituted materials and products and the Engineer's decision will be final.
- C. When the Contractor elects to substitute non-metric materials and products, including materials and products shown on the plans or in the special provisions as being equivalent, the list of sources of material specified in Section 6-1.01, "Source of Supply and Quality of Materials," of the Standard Specification shall include a list of substitutions to be made and contract items involved. In addition, for a change in design or details, the Contractor shall submit plans and working drawings in conformance with the provisions in Section 5-1.02, "Plans and Working Drawings," of the Standard Specifications. The plans and working drawings shall be submitted at least 7 days before the Contractor intends to begin the work involved.

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

SUBSTITUTION TABLE FOR PLAIN WIRE REINFORCEMENT

ASTM Designation: A 82

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

SUBSTITUTION TABLE FOR BAR REINFORCEMENT

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

<sup>1</sup>Bar designation numbers approximate the number of millimeters of the nominal diameter of the bars.

<sup>2</sup>Bar numbers are based on the number of eighths of an inch included in the nominal diameter of the bars.

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

SUBSTITUTION TABLE FOR SIZES OF:

(1) STEEL FASTENERS FOR GENERAL APPLICATIONS (ASTM Designation: A 307 or AASHTO Designation: M 314, Grade 36 or 55), and

(2) HIGH STRENGTH STEEL FASTENERS (ASTM Designation: A 325 or A 449)

METRIC SIZE SHOWN ON THE PLANS mm	SIZE TO BE SUBSTITUTED inch
6 or 6.35	1/4
8 or 7.94	5/16
10 or 9.52	3/8
11 or 11.11	7/16
13, 12.70, or M12	1/2
14 or 14.29	9/16
16, 15.88, or M16	5/8
19, 19.05, or M20	3/4
22, 22.22, or M22	7/8
24, 25, 25.40, or M24	1
29, 28.58, or M27	1-1/8
32, 31.75, or M30	1-1/4
35 or 34.93	1-3/8
38, 38.10, or M36	1-1/2
44 or 44.45	1-3/4
51 or 50.80	2
57 or 57.15	2-1/4
64 or 63.50	2-1/2
70 or 69.85	2-3/4
76 or 76.20	3
83 or 82.55	3-1/4
89 or 88.90	3-1/2
95 or 95.25	3-3/4
102 or 101.60	4

SUBSTITUTION TABLE FOR NOMINAL THICKNESS OF SHEET METAL

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

**SUBSTITUTION TABLE FOR WIRE**

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

**SUBSTITUTION TABLE FOR PIPE PILES**

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

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

**SUBSTITUTION TABLE FOR CIDH CONCRETE PILING**

METRIC SIZE SHOWN ON THE PLANS	ACTUAL AUGER SIZE TO BE SUBSTITUTED inches
350 mm	14
400 mm	16
450 mm	18
600 mm	24
750 mm	30
900 mm	36
1.0 m	42
1.2 m	48
1.5 m	60
1.8 m	72
2.1 m	84
2.4 m	96
2.7 m	108
3.0 m	120
3.3 m	132
3.6 m	144
4.0 m	156

**SUBSTITUTION TABLE FOR STRUCTURAL TIMBER AND LUMBER**

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

SUBSTITUTION TABLE FOR NAILS AND SPIKES

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

SUBSTITUTION TABLE FOR IRRIGATION  
COMPONENTS

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

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

**8-1.02 PREQUALIFIED AND TESTED SIGNING AND DELINEATION MATERIALS**

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

The manufacturer of products on the list of Prequalified and Tested Signing and Delineation Materials shall furnish the Engineer a Certificate of Compliance in conformance with the provisions in Section 6-1.07, "Certificates of Compliance," of the Standard Specifications for each type of traffic product supplied.

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

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

## **PAVEMENT MARKERS, PERMANENT TYPE**

### **Retroreflective With Abrasion Resistant Surface (ARS)**

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

### **Retroreflective With Abrasion Resistant Surface (ARS)**

(for recessed applications only)

- A. Avery Dennison, Model 948 (58 mm x 119 mm)
- B. Avery Dennison, Model 944SB (51 mm x 100 mm)\*
- C. Ray-O-Lite, Model 2002 (58 mm x 117 mm)
- D. Ray-O-Lite, Model 2004 ARS (51 mm x 100 mm)\*

\*For use only in 114 mm wide (older) recessed slots

### **Non-Reflective, 100 mm Round**

- A. 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" (75 mm x 100 mm)

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

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

- A. Apex Universal, Model 932
- B. Bunzl Extrusion, Models T.O.M., T.R.P.M., and "HH" (High Heat)
- C. Hi-Way Safety, Inc., Model 1280/1281
- 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, 150 mm x 150 mm**

- A. Highway Ceramics, Inc.

**CLASS 1 DELINEATORS**

**One Piece Driveable Flexible Type, 1700 mm**

- A. Bunzl Extrusion, "Flexi-Guide Models 400 and 566"
- B. Carsonite, Curve-Flex CFRM-400
- C. Carsonite, Roadmarker CRM-375
- D. FlexStake, Model 654 TM
- E. GreenLine Models HWD1-66 and CGD1-66

**Special Use Type, 1700 mm**

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

**Surface Mount Type, 1200 mm**

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

**CHANNELIZERS**

**Surface Mount Type, 900 mm**

- A. Bent Manufacturing Company, Masterflex Models MF-360-36 (Round) and MF-180-36 (Flat)
- B. Bunzl Extrusion, Flexi-Guide Models 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, 1070 mm**

(For 700 mm Traffic Cones, see Standard Specifications)

- A. Bent Manufacturing Company "T-Top"
- B. Plastic Safety Systems "Navigator-42"
- C. Radiator Specialty Company "Enforcer"
- D. Roadmaker Company "Stacker"
- E. Traffix Devices "Grabber"
- F. Three D Traffic Works "Ringtop" TD7000, ID No. 742143

### **OBJECT MARKERS**

#### **Type "K", 450 mm**

- A. Bunzl, Model FG318PE
- B. Carsonite, Model SMD 615
- C. FlexStake, Model 701 KM
- D. Repo, Models 300 and 400
- E. Safe-Hit, Model SH718SMA

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

- A. Bent Manufacturing "Masterflex" Model MF-360-24
- B. Bunzl Extrusion, Model FG324PE
- C. Carsonite, Super Duck II
- D. FlexStake, Model 701KM
- E. Repo, Models 300 and 400
- F. Safe-Hit, Models SH8 24SMA\_WA and SH8 24GP3\_WA
- G. The Line Connection, Model DP21-4Q
- H. Three D Traffic Works "Q" Marker, 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" (75 mm x 254 mm)
- B. Creative Building Products, "Dura-Bull, Model 11201"
- C. Duraflex Corp., "Railrider"
- D. Plastic Vacuum Forming, "Cap-It C300"

### **CONCRETE BARRIER DELINEATORS, 400 mm**

(For use to the right of traffic)

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

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

- A. Stinson Equipment Company "SaddleMarker"

### **SOUND WALL DELINEATOR**

(Applied vertically. Place top of 75 mm x 300 mm reflective element at 1200 mm above roadway)

- A. Bunzl Extrusion, PCBM S-36

### **GUARD RAILING DELINEATOR**

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

#### **Wood Post Type, 686 mm**

- A. Bunzl Extrusion, FG 427 and FG 527
- B. Carsonite, Model 427
- C. FlexStake, Model 102 GR
- D. GreenLine GRD 27
- E. 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, 330 mm Sleeves**

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

#### **Traffic Cones, 100 mm and 150 mm 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), 750 mm
- 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" (13 mm for Post-Mounted CZ Signs, 1200 mm or less)

### **Aluminum Composite**

- A. Alcan Composites "Dibond Material, 2 mm" (for temporary construction signs only)
- B. Mitsubishi Chemical America, Alpolic 350 (for temporary construction signs only)

## **8-1.03 STATE-FURNISHED MATERIALS**

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

The following materials will be furnished to the Contractor:

- A. Light emitting diode signal modules for vehicular traffic signal units, and Type A pedestrian signals.
- B. Model 2070 controller assembly, including controller unit, completely wired controller cabinet, and inductive loop detector sensor units.
- C. Battery backup system.
- D. Construction Staking Supplies.

Completely wired controller cabinets, with auxiliary equipment but without controller unit, will be furnished to the Contractor at 50 Higuera Street, San Luis Obispo Ca 93401.

The Contractor shall notify the Engineer not less than 48 hours before State-furnished material is to be picked up by the Contractor. A full description of the material and the time the material will be picked up shall be provided.

## **SECTION 8-2. CONCRETE**

### **8-2.01 PORTLAND CEMENT CONCRETE**

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

References to Section 90-2.01, "Portland Cement," of the Standard Specifications shall mean Section 90-2.01, "Cement," of the Standard Specifications.

Mineral admixture shall be combined with cement in conformance with the provisions in Section 90-4.08, "Required Use of Mineral Admixtures," of the Standard Specifications for the concrete materials specified in Section 56-2, "Roadside Signs," of the Standard Specifications.

The requirements of Section 90-4.08, "Required Use of Mineral Admixture," of the Standard Specifications shall not apply to Section 19-3.025C, "Soil Cement Bedding," of the Standard Specifications.

The Department maintains a list of sources of fine and coarse aggregate that have been approved for use with a reduced amount of mineral admixture in the total amount of cementitious material to be used. A source of aggregate will be considered for addition to the approved list if the producer of the aggregate submits to the Transportation Laboratory certified test results from a qualified testing laboratory that verify the aggregate complies with the requirements. Prior to starting the testing, the aggregate test shall be registered with the Department. A registration number can be obtained by calling (916) 227-7228. The registration number shall be used as the identification for the aggregate sample in correspondence with the Department. Upon request, a split of the tested sample shall be provided to the Department. Approval of aggregate will depend upon compliance with the specifications, based on the certified test results submitted, together with any replicate testing the Department may elect to perform. Approval will expire 3 years from the date the most recent registered and evaluated sample was collected from the aggregate source.

Qualified testing laboratories shall conform to the following requirements:

- A. Laboratories performing ASTM Designation: C 1293 shall participate in the Cement and Concrete Reference Laboratory (CCRL) Concrete Proficiency Sample Program and shall have received a score of 3 or better on all tests of the previous 2 sets of concrete samples.
- B. Laboratories performing ASTM Designation: C 1260 shall participate in the Cement and Concrete Reference Laboratory (CCRL) Pozzolan Proficiency Sample Program and shall have received a score of 3 or better on the shrinkage and soundness tests of the previous 2 sets of pozzolan samples.

Aggregates on the list shall conform to one of the following requirements:

- A. When the aggregate is tested in conformance with the requirements in California Test 554 and ASTM Designation: C 1293, the average expansion at one year shall be less than or equal to 0.040 percent; or
- B. When the aggregate is tested in conformance with the requirements in California Test 554 and ASTM Designation: C 1260, the average of the expansion at 16 days shall be less than or equal to 0.15 percent.

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

- A. The minimum amount of cement shall not be less than 75 percent by mass of the specified minimum cementitious material content.
- B. The minimum amount of mineral admixture to be combined with cement shall be determined using one of the following criteria:
  - 1. When the calcium oxide content of a mineral admixture is equal to or less than 2 percent by mass, the amount of mineral admixture shall not be less than 15 percent by mass of the total amount of cementitious material to be used in the mix.
  - 2. When the calcium oxide content of a mineral admixture is greater than 2 percent by mass, and any of the aggregates used are not listed on the approved list as specified in these special provisions, then the amount of mineral admixture shall not be less than 25 percent by mass of the total amount of cementitious material to be used in the mix.
  - 3. When the calcium oxide content of a mineral admixture is greater than 2 percent by mass and the fine and coarse aggregates are listed on the approved list as specified in these special provisions, then the amount of mineral admixture shall not be less than 15 percent by mass of the total amount of cementitious material to be used in the mix.
  - 4. When a mineral admixture that conforms to the provisions for silica fume in Section 90-2.04, "Admixture Materials," of the Standard Specifications is used, the amount of mineral admixture shall not be less than 10 percent by mass of the total amount of cementitious material to be used in the mix.
  - 5. When a mineral admixture that conforms to the provisions for silica fume in Section 90-2.04, "Admixture Materials," of the Standard Specifications is used and the fine and coarse aggregates are listed on the approved list as specified in these special provisions, then the amount of mineral admixture shall not be less than 7 percent by mass of the total amount of cementitious material to be used in the mix.
- C. The total amount of mineral admixture shall not exceed 35 percent by mass of the total amount of cementitious material to be used in the mix. Where Section 90-1.01, "Description," of the Standard Specifications specifies a maximum cementitious content in kilograms per cubic meter, the total mass of cement and mineral admixture per cubic meter shall not exceed the specified maximum cementitious material content.

### SECTION 8-3. WELDING

#### 8-3.01 WELDING

##### GENERAL

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

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

AWS Code	Year of Adoption
D1.1	2006
D1.4	2005
D1.5	2002
D1.6	1999

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

Section 6.1.1.1 of AWS D1.5 is replaced with the following:

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

Unless otherwise specified, Sections 6.1.3 through 6.1.4.3 of AWS D1.1, Section 7.1.2 of AWS D1.4, and Sections 6.1.1.2 through 6.1.3.3 of AWS D1.5 are replaced with the following:

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

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

The QC Inspector shall be responsible for quality control acceptance or rejection of materials and workmanship, and shall be currently certified as an AWS Certified Welding Inspector (CWI) in conformance with the requirements in AWS QC1, "Standard for AWS Certification of Welding Inspectors."

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

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

When any work is welded in conformance with the provisions in Section 75, "Miscellaneous Metal," of the Standard Specifications, not including Section 75-1.035, "Bridge Joint Restrainer Units," of the Standard Specifications, Section 6.1.4 of AWS D1.1 is replaced with the following:

The QC Inspector shall be responsible for quality control acceptance or rejection of materials and workmanship and shall be currently certified as an AWS CWI in conformance with the requirements in AWS QC1, "Standard for AWS Certification of Welding Inspectors," or as a Welding Inspector Specialist (WIS) in conformance with the requirements in AWS B5.2, "Specification for the Qualification of Welding Inspector Specialists and Welding Inspector Assistants."

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

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

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

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

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

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

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

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

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

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

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

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

In addition to the requirements of AWS D1.1, welding procedures qualification for work welded in conformance with that code shall conform to the following requirements:

- A. The travel speed, amperage, and voltage values that are used for tests conducted per AWS D1.1, Section 4.1.1, shall be consistent for each pass in a weld joint and shall in no case vary by more than  $\pm 10$  percent for travel speed,  $\pm 10$  percent for amperage, and  $\pm 7$  percent for voltage as measured from a predetermined target value or average within each weld pass. The travel speed shall in no case vary by more than  $\pm 15$  percent when using submerged arc welding.
- B. When a nonstandard weld joint is to be made using a combination of WPSs, a single test may be conducted combining the WPSs to be used in production, provided the essential variables, including weld bead placement, of each process are limited to those established in Table 4.5.

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

- A. Unless considered prequalified, fillet welds shall be qualified in each position. The fillet weld soundness test shall be conducted using the essential variables of the WPS as established by the Procedure Qualification Record (PQR).
- B. For qualification of joints that do not conform to Figures 2.4 and 2.5 of AWS D1.5, a minimum of two WPS qualification tests are required. The tests shall be conducted using both Figure 5.1 and Figure 5.3. The test conforming to Figure 5.1 shall be conducted in conformance with AWS D1.5, Section 5.12 or 5.13. The test conforming to Figure 5.3 shall be conducted using the welding electrical parameters that were established for the test conducted conforming to Figure 5.1. The ranges of welding electrical parameters established during welding per Figure 5.1 in conformance with AWS D1.5, Section 5.12, shall be further restricted according to the limits in Table 5.3 during welding per Figure 5.3.
- C. Multiple zones within a weld joint may be qualified. The travel speed, amperage, and voltage values that are used for tests conducted per AWS D1.5 Section 5.13 shall be consistent for each pass in a weld joint, and shall in no case vary by more than  $\pm 10$  percent for travel speed,  $\pm 10$  percent for amperage, and  $\pm 7$  percent for voltage as measured from a predetermined target value or average within each weld pass or zone. The travel speed shall in no case vary by more than  $\pm 15$  percent when using submerged arc welding.

- D. For a WPS qualified in conformance with AWS D1.5 Section 5.13, the values to be used for calculating ranges for current and voltage shall be based on the average of all weld passes made in the test. Heat input shall be calculated using the average of current and voltage of all weld passes made in the test for a WPS qualified in conformance with Section 5.12 or 5.13.
- E. Macroetch tests are required for WPS qualification tests, and acceptance shall be per AWS D1.5 Section 5.19.3.
- F. When a nonstandard weld joint is to be made using a combination of WPSs, a test conforming to Figure 5.3 may be conducted combining the WPSs to be used in production, provided the essential variables, including weld bead placement, of each process are limited to those established in Table 5.3.
- G. Prior to preparing mechanical test specimens, the PQR welds shall be inspected by visual and radiographic tests. Backing bar shall be 75 mm in width and shall remain in place during NDT testing. Results of the visual and radiographic tests shall comply with AWS D1.5 Section 6.26.2, excluding Section 6.26.2.2. Test plates that do not comply with both tests shall not be used.

## **WELDING QUALITY CONTROL**

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

Unless otherwise specified, welding quality control shall apply when any work is welded in conformance with the provisions in Section 49, "Piling," Section 52, "Reinforcement," Section 55, "Steel Structures," of the Standard Specifications.

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

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

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

When joint weld details that are not prequalified to the details of Section 3 of AWS D1.1 or to the details of Figure 2.4 or 2.5 of AWS D1.5 are proposed for use in the work, the joint details, their intended locations, and the proposed welding parameters and essential variables, shall be approved by the Engineer. The Contractor shall allow the Engineer 2 weeks to complete the review of the proposed joint detail locations. In the event the Engineer fails to complete the review within the time allowed, and if, in the opinion of the Engineer, completion of the work is delayed or interfered with by reason of the Engineer's delay in completing the review, the Contractor will be compensated for any resulting loss, and an extension of time will be granted, in the same manner as provided for in Section 8-1.09, "Right of Way Delays," of the Standard Specifications. Upon approval of the proposed joint detail locations and qualification of the proposed joint details, welders and welding operators using these details shall perform a qualification test plate using the WPS variables and the joint detail to be used in production. The test plate shall have the maximum thickness to be used in production and a minimum length of 460 mm. The test plate shall be mechanically and radiographically tested. Mechanical and radiographic testing and acceptance criteria shall be as specified in the applicable AWS codes.

The Engineer will witness all qualification tests for WPSs that were not previously approved by the Department. Unless otherwise specified, an approved independent third party will witness the qualification tests for welders or welding operators. The independent third party shall be a current CWI and shall not be an employee of the contractor performing the welding. The Contractor shall allow the Engineer 2 weeks to review the qualifications and copy of the current certification of the independent third party. In the event the Engineer fails to complete the review within the time allowed, and if, in the opinion of the Engineer, completion of the work is delayed or interfered with by reason of the Engineer's delay in completing the review, the Contractor will be compensated for any resulting loss, and an extension of time will be granted, in the same manner as provided for in Section 8-1.09, "Right of Way Delays," of the Standard Specifications. The Contractor shall notify the Engineer one week prior to performing any qualification tests. Witnessing of qualification tests by the Engineer shall not constitute approval of the intended joint locations, welding parameters, or essential variables.

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

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

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

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

- A. The work is welded in conformance with AWS D1.5 and is performed at a permanent fabrication or manufacturing facility that is certified under the AISC Quality Certification Program, Category Cbr, Major Steel Bridges and Fracture Critical endorsement F, when applicable.
- B. The welding is performed on pipe pile material at a permanent pipe manufacturing facility authorized to apply the American Petroleum Institute (API) monogram for API 5L pipe.

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

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

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

The Contractor shall allow the Engineer 2 weeks to review the WQCP submittal after a complete plan has been received. No welding shall be performed until the WQCP is approved in writing by the Engineer. In the event the Engineer fails to complete the review within the time allowed, and if, in the opinion of the Engineer, completion of the work is delayed or interfered with by reason of the Engineer's delay in completing the review, the Contractor will be compensated for any resulting loss, and an extension of time will be granted, in the same manner as provided for in Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

An amended WQCP or any addendum to the approved WQCP shall be submitted to, and approved in writing by the Engineer, for proposed revisions to the approved WQCP. An amended WQCP or addendum will be required for revisions to the WQCP, including but not limited to a revised WPS; additional welders; changes in NDT firms, QC, or NDT personnel or procedures; or updated systems for tracking and identifying welds. The Engineer shall have one week to complete the review of the amended WQCP or addendum. Work affected by the proposed revisions shall not be performed until the amended WQCP or addendum has been approved. In the event the Engineer fails to complete the review within the time allowed, and if, in the opinion of the Engineer, completion of the work is delayed or interfered with by reason of the Engineer's delay in completing the review, the Contractor will be compensated for any resulting loss, and an extension of time will be granted, in the same manner as provided for in Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

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

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

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

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

The following items shall be included in a Welding Report that is to be submitted to the Engineer within 2 weeks following the performance of any welding:

- A. A daily production log.
- B. Reports of all visual weld inspections and NDT.
- C. Radiographs and radiographic reports, and other required NDT reports.
- D. A summary of welding and NDT activities that occurred during the reporting period.
- E. Reports of each application of heat straightening.

- F. A summarized log listing the rejected lengths of weld by welder, position, process, joint configuration, and piece number.
- G. Documentation that the Contractor has evaluated all radiographs and other nondestructive tests and corrected all rejectable deficiencies, and that all repaired welds have been reexamined using the required NDT and found acceptable.

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

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

The Engineer will review the Welding Report to determine if the Contractor is in conformance with the WQCP. Unless otherwise specified, the Engineer shall be allowed 2 weeks to review the report and respond in writing after the complete Welding Report has been received. Prior to receiving notification from the Engineer of the Contractor's conformance with the WQCP, the Contractor may encase in concrete or cover welds for which the Welding Report has been submitted. However, should the Contractor elect to encase or cover those welds prior to receiving notification from the Engineer, it is expressly understood that the Contractor shall not be relieved of the responsibility for incorporating material in the work that conforms to the requirements of the plans and specifications. Material not conforming to these requirements will be subject to rejection. Should the Contractor elect to wait to encase or cover welds pending notification by the Engineer, and in the event the Engineer fails to complete the review within the time allowed, and if, in the opinion of the Engineer, completion of the work is delayed or interfered with by reason of the Engineer's delay in completing the review, the Contractor will be compensated for any resulting loss, and an extension of time will be granted, in the same manner as provided for in Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

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

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

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

The Contractor shall allow the Engineer one week to review these procedures. No remedial work shall begin until the repair procedures are approved in writing by the Engineer. In the event the Engineer fails to complete the review within the time allowed, and if, in the opinion of the Engineer, completion of the work is delayed or interfered with by reason of the Engineer's delay in completing the review, the Contractor will be compensated for any resulting loss, and an extension of time will be granted, in the same manner as provided for in Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

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

### **WELDING FOR POLE STRUCTURES**

The Contractor shall meet the following requirements for any work welded in conformance with the provisions in Section 86-2.04, "Standards, Steel Pedestals and Posts," of the Standard Specifications.

Welding inspection personnel or NDT firms to be used in the work shall not be employed or compensated by any subcontractor, or by other persons or entities hired by subcontractors, who will provide other services or materials for the project, except for when the welding is performed at a permanent fabrication or manufacturing facility which is certified under the AISC Quality Certification Program, Category Sbd, Conventional Steel Building Structures.

**Welding Qualification Audit**

Contractors or subcontractors performing welding operations for pole structures shall not deliver materials to the project without having successfully completed the Department's "Manufacturing Qualification Audit for Overhead Sign and Pole Structures," hereinafter referred to as the audit, not more than one year prior to the delivery of the materials. The Engineer will perform the audit. Copies of the audit form, and procedures for requesting and completing the audit, are available at the Transportation Laboratory or at:

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

An audit that was approved by the Engineer no more than one year prior to the beginning of work on this contract will be acceptable for the entire period of this contract, provided the Engineer determines the audit was for the same type of work that is to be performed on this contract.

Successful completion of an audit shall not relieve the Contractor of the responsibility for furnishing materials or producing finished work of the quality specified in these special provisions and as shown on the plans.

**Welding Report**

For work welded in conformance with the provisions in Section 86-2.04, "Standards, Steel Pedestals and Posts," of the Standard Specifications, a Welding Report shall be submitted in conformance with the provisions in "Welding Quality Control" of these special provisions.

**PAYMENT**

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

**SECTION 9. (BLANK)**

**SECTION 10. CONSTRUCTION DETAILS**

**SECTION 10-1. GENERAL**

**10-1.01 CONSTRUCTION PROJECT INFORMATION SIGNS**

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

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

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

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

FEDERAL HIGHWAY TRUST FUNDS
STATE HIGHWAY FUNDS

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

**HIGHWAY REPAIR**

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.

#### **10-1.02 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.

No work shall be performed without maintaining convenient access to driveways, businesses, and buildings along the line of work. Delivery trucks must be able to deliver and pick up for all businesses. The Contractor shall conduct his operations so that public traffic on Route 255 has access to all side roads, and public and private driveways when work is not actively in progress.

The Contractor shall conduct his operations so that pedestrian traffic has reasonable access to all businesses at all times.

The Contractor shall notify the Engineer, in writing, of those business establishments that will be impacted at least 5 days prior to actual construction activity which will cause the impact.

The Contractor shall not store equipment in the parking lot of the businesses, without the property owner's written permission.

The Contractor shall conduct all minor concrete (miscellaneous construction) work on one side of the roadway only and no more than 2 (two) successive blocks at any one time.

The new signal shall be in place and functional prior to removal of the existing signal.

Tree removal or pruning shall be performed between September 1 and February 15<sup>th</sup>.

The Contractor shall notify the Engineer and City of Santa Barbara Parks and Recreation Department Arborist at (805) 564-5435 fifteen (15) working days prior to the following stages of work:

A. Root pruning of existing trees.

B. Completion of sidewalk construction and root barrier installation adjacent to existing trees.

C. End of the plant establishment period.

Attention is directed to "Miscellaneous Concrete Construction" of these special provisions regarding constructing a 600 mm by 600 mm test panel prior to constructing curb ramps with detectable warning surfaces.

Temporary railing (Type K) and temporary crash cushions shall be secured in place prior to commencing work for which the temporary railing and crash cushions are required.

Attention is directed to "Environmentally Sensitive Area" of these special provisions. Prior to beginning work, the boundaries of the Environmentally Sensitive Areas (ESA) shall be clearly delineated in the field.

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

Attention is directed to "General Migratory Bird Protection" of these special provisions regarding clearing and grubbing of bird habitat.

The first order of work shall be to place the order for the electrical equipment.

Prior to commencement of the traffic signal functional test at any location, all items of work related to signal control shall be completed and all roadside signs, pavement delineation, and pavement markings shall be in place at that location.

At those locations exposed to public traffic where guard railings or barriers are to be reconstructed, 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.

Not less than 70 days prior to planting the plants, the Contractor shall furnish the Engineer a statement from the vendor that the order for the plants required for this contract, including inspection plants, has been received and accepted by the vendor. The statement from the vendor shall include the names, sizes, and quantities of plants ordered and the anticipated date of delivery.

The Contractor shall place orders for replacement plants with the vendor at the appropriate time so that the roots of the replacement plants are not in a root-bound condition.

Not less than 70 days prior to applying seeds, the Contractor shall furnish the Engineer a statement from the vendor that the order for the seed required for this contract has been received and accepted by the vendor. The statement from the vendor shall include the names and quantity of seed ordered and the anticipated date of delivery.

### **10-1.03 MIGRATORY BIRD PROTECTION**

The Contractor shall protect migratory birds, their occupied nests, and their eggs as specified in these special provisions.

Nesting or attempted nesting by migratory birds is anticipated to occur between, but not limited to, February 15 and September 1.

The Federal Migratory Bird Treaty Act (16 U.S.C. 703 et seq.), Title 50 Code of Federal Regulations part 10, and California Department of Fish and Game Code Sections 3503, 3513, and 3800, protect migratory birds, their occupied nests, and their eggs.

The Federal and California Endangered Species Acts protect occupied and unoccupied nests of some threatened and endangered bird species. The Bald Eagle Protection Act (16 U.S.C. 668) prohibits the destruction of bald and golden eagles occupied and unoccupied nests.

Between stations 38+10 and 38+61, Route 225, when evidence of migratory bird nesting that may be adversely affected by construction activities is discovered, or when birds are injured or killed as a result of construction activities, the Contractor shall immediately stop work within 100 m of the nests and notify the Engineer. Work shall not resume until the Engineer provides written notification that work may begin in this location.

When ordered by the Engineer the Contractor shall use exclusion devices or remove and dispose of partially constructed and unoccupied nests of migratory birds on a regular basis to prevent their occupation.

Penalties as used in this section, "Migratory Bird Protection," shall include fines, penalties, and damages; whether proposed, assessed, or levied against the Department or the Contractor. Penalties shall also include payments made or costs incurred in settlement for alleged violations of applicable laws, regulations, or requirements. Costs incurred could include sums spent instead of penalties, in mitigation or to remediate or correct violations.

Notwithstanding any other remedies authorized by law, the Department may retain or withhold monies due the Contractor under the contract, in an amount determined by the Department, up to and including the entire amount of penalties proposed, assessed, or levied as a result of the Contractor's violation of Federal or State law, regulations or requirements. The Department may retain funds until final disposition has been made as to the penalties. The Contractor shall remain liable for the full amount of penalties until such time as they are finally resolved with the entity seeking the penalties. Upon final disposition, the Department shall inform the Contractor of the withheld amount.

Full compensation for migratory bird protection shall be considered as included in the various items of contract work and no separate payment will be allowed therefore.

A delay to the controlling item due to migratory birds or their nests will be considered a temporary suspension of work in accordance with the provisions in Section 8-1.05, "Temporary Suspension of Work," of the Standard Specifications. Adjustments will be made for delays that the Engineer determines are not due to the Contractor's failure to perform the provision of the contract in the same manner as for suspensions due to unsuitable weather in Section 8-1.05.

### **10-1.04 WATER POLLUTION CONTROL**

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

This project lies within the boundaries of the Region 3 (Central Coast) Regional Water Quality Control Board (RWQCB).

The State Water Resources Control Board (SWRCB) has issued a permit to the Department which governs storm water and non-storm water discharges from its properties, facilities and activities. The Department's Permit is entitled: "Order No. 99-06-DWQ, NPDES No. CAS000003, National Pollutant Discharge Elimination System (NPDES) Permit, Storm Water Permit and Waste Discharge Requirements (WDRs) for the State of California, Department of Transportation Properties, Facilities, and Activities." Copies of the Department's Permit are available for review from the SWRCB, Storm Water Permit Unit, 1001 "I" Street, P.O. Box 1977, Sacramento, California 95812-1977, Telephone: (916) 341-5254, and may also be obtained from the SWRCB Internet website at:

<http://www.swrcb.ca.gov/stormwtr/caltrans.html>.

The Department's Permit references and incorporates by reference the current Statewide General Permit issued by the SWRCB entitled "Order No. 99-08-DWQ, National Pollutant Discharge Elimination System (NPDES) General Permit No. CAS000002, Waste Discharge Requirements (WDRs) for Discharges of Storm Water Associated with Construction Activity," which regulates discharges of storm water and non-storm water from construction activities disturbing 0.4-hectare or more of soil in a common plan of development. Sampling and analysis requirements as specified in SWRCB Resolution No. 2001-46 are added to the Statewide General Permit. Copies of the Statewide General Permit and modifications thereto are available for review from the SWRCB, Storm Water Permit Unit, 1001 "I" Street, P.O. Box 1977, Sacramento, California 95812-1977, Telephone: (916) 341-5254 and may also be obtained from the SWRCB Internet website at: <http://www.swrcb.ca.gov/stormwtr/construction.html>.

This project shall conform to the Permits and modifications thereto. The Contractor shall maintain copies of the Permits at the project site and shall make the Permits available during construction.

The Permits require the preparation of a Storm Water Pollution Prevention Plan (SWPPP). The SWPPP shall be prepared in conformance with the requirements of the Permits, the Department's "Storm Water Pollution Prevention Plan (SWPPP) and Water Pollution Control Program (WPCP) Preparation Manual," and the Department's "Construction Site Best Management Practices (BMPs) Manual," including addenda to those permits and manuals issued up to and including the date of advertisement of the project. These manuals are hereinafter referred to, respectively, as the "Preparation Manual" and the "Construction Site BMPs Manual," and collectively, as the "Manuals." Copies of the Manuals may be obtained from the Department of Transportation, Material Operations Branch, Publication Distribution Unit, 1900 Royal Oaks Drive, Sacramento, California 95815, Telephone: (916) 445-3520, and may also be obtained from the Department's Internet website at:

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

The Contractor shall know and fully comply with applicable provisions of the Permits and all modifications thereto, the Manuals, and Federal, State, and local regulations and requirements that govern the Contractor's operations and storm water and non-storm water discharges from both the project site and areas of disturbance outside the project limits during construction. Attention is directed to Sections 7-1.01, "Laws to be Observed," and 7-1.12, "Indemnification and Insurance," of the Standard Specifications.

The Permits shall apply to storm water and certain permitted non-storm water discharges from areas outside the project site which are directly related to construction activities for this contract including, but not limited to, asphalt batch plants, material borrow areas, concrete plants, staging areas, storage yards and access roads. The Contractor shall comply with the Permits and the Manuals for those areas and shall implement, inspect and maintain the required water pollution control practices. The Engineer shall be allowed full access to these areas during construction to assure Contractor's proper implementation of water pollution control practices. Installing, inspecting and maintaining water pollution control practices on areas outside the highway right of way not specifically arranged and provided for by the Department for the execution of this contract, will not be paid for.

The Contractor shall be responsible for penalties assessed or levied on the Contractor or the Department as a result of the Contractor's failure to comply with the provisions in this section "Water Pollution Control" including, but not limited to, compliance with the applicable provisions of the Permits, the Manuals, and Federal, State and local regulations and requirements as set forth therein.

Penalties as used in this section, "Water Pollution Control," shall include fines, penalties and damages, whether proposed, assessed, or levied against the Department or the Contractor, including those levied under the Federal Clean Water Act and the State Porter-Cologne Water Quality Control Act, by governmental agencies or as a result of citizen suits. Penalties shall also include payments made or costs incurred in settlement for alleged violations of the Permits, the Manuals, or applicable laws, regulations, or requirements. Costs incurred could include sums spent instead of penalties, in mitigation or to remediate or correct violations.

### **RETENTION OF FUNDS**

Notwithstanding any other remedies authorized by law, the Department may retain money due the Contractor under the contract, in an amount determined by the Department, up to and including the entire amount of Penalties proposed, assessed, or levied as a result of the Contractor's violation of the Permits, the Manuals, or Federal or State law, regulations or requirements. Funds may be retained by the Department until final disposition has been made as to the Penalties. The Contractor shall remain liable for the full amount of Penalties until such time as they are finally resolved with the entity seeking the Penalties.

Retention of funds for failure to conform to the provisions in this section, "Water Pollution Control," shall be in addition to the other retention amounts required by the contract. The amounts retained for the Contractor's failure to conform to provisions in this section will be released for payment on the next monthly estimate for partial payment following the date when an approved SWPPP has been implemented and maintained, and when water pollution has been adequately controlled, as determined by the Engineer.

When a regulatory agency identifies a failure to comply with the Permits and modifications thereto, the Manuals, or other Federal, State or local requirements, the Department may retain money due the Contractor, subject to the following:

- A. The Department will give the Contractor 30 days notice of the Department's intention to retain funds from partial payments which may become due to the Contractor prior to acceptance of the contract. Retention of funds from payments made after acceptance of the contract may be made without prior notice to the Contractor.

- B. No retention of additional amounts out of partial payments will be made if the amount to be retained does not exceed the amount being withheld from partial payments pursuant to Section 9-1.06, "Partial Payments," of the Standard Specifications.
- C. If the Department has retained funds, and it is subsequently determined that the State is not subject to the entire amount of the Costs and Liabilities assessed or proposed in connection with the matter for which the retention was made, the Department shall be liable for interest on the amount retained for the period of the retention. The interest rate payable shall be 6 percent per annum.

During the first estimate period that the Contractor fails to conform to the provisions in this section, "Water Pollution Control," the Department may retain an amount equal to 25 percent of the estimated value of the contract work performed.

The Contractor shall notify the Engineer immediately upon request from the regulatory agencies to enter, inspect, sample, monitor, or otherwise access the project site or the Contractor's records pertaining to water pollution control work. The Contractor and the Department shall provide copies of correspondence, notices of violation, enforcement actions or proposed fines by regulatory agencies to the requesting regulatory agency.

#### **STORM WATER POLLUTION PREVENTION PLAN PREPARATION, APPROVAL AND AMENDMENTS**

As part of the water pollution control work, a Storm Water Pollution Prevention Plan (SWPPP) is required for this contract. The SWPPP shall conform to the provisions in Section 7-1.01G, "Water Pollution," of the Standard Specifications, the requirements in the Manuals, the requirements of the Permits, and these special provisions. Upon the Engineer's approval of the SWPPP, the SWPPP shall be considered to fulfill the provisions in Section 7-1.01G, "Water Pollution," of the Standard Specifications for development and submittal of a Water Pollution Control Program.

No work having potential to cause water pollution shall be performed until the SWPPP has been approved by the Engineer. Approval shall not constitute a finding that the SWPPP complies with applicable requirements of the Permits, the Manuals and applicable Federal, State and local laws, regulations, and requirements.

The Contractor shall designate a Water Pollution Control Manager. The Water Pollution Control Manager shall be responsible for the preparation of the SWPPP and required modifications or amendments, and shall be responsible for the implementation and adequate functioning of the various water pollution control practices employed. The Contractor may designate different Water Pollution Control Managers to prepare the SWPPP and to implement the water pollution control practices. The Water Pollution Control Managers shall serve as the primary contact for issues related to the SWPPP or its implementation. The Contractor shall submit to the Engineer a statement of qualifications, describing the training, previous work history and expertise of the individual selected by the Contractor to serve as Water Pollution Control Manager. The Water Pollution Control Manager shall have a minimum of 24 hours of formal storm water management training or certification as a Certified Professional in Erosion and Sediment Control (CPESC). The Engineer will reject the Contractor's submission of a Water Pollution Control Manager if the submitted qualifications are deemed to be inadequate.

The SWPPP shall apply to the areas within and those outside of the highway right of way that are directly related to construction operations including, but not limited to, asphalt batch plants, material borrow areas, concrete plants, staging areas, storage yards, and access roads.

The SWPPP shall incorporate water pollution control practices in the following categories:

- A. Soil stabilization.
- B. Sediment control.
- C. Wind erosion control.
- D. Tracking control.
- E. Non-storm water management.
- F. Waste management and materials pollution control.

The following contract items of work shall be incorporated into the SWPPP as "Temporary Water Pollution Control Practices": Temporary Concrete Washout (Portable) and Drainage Inlet Markers. The Contractor's attention is directed to the special provisions provided for Temporary Water Pollution Control Practices.

The SWPPP shall include, but not be limited to, the items described in the Manuals, Permits and related information contained in the contract documents. The SWPPP shall also include a copy of the following: Notification of Construction.

The Contractor shall develop a Water Pollution Control Schedule that describes the timing of grading or other work activities that could affect water pollution. The Water Pollution Control Schedule shall be updated by the Contractor to reflect changes in the Contractor's operations that would affect the necessary implementation of water pollution control practices.

The Contractor shall complete the "Construction Site BMPs Consideration Checklist" presented in the Preparation Manual and shall incorporate water pollution control practices into the SWPPP. Water pollution control practices include the "Minimum Requirements" and other Contractor-selected water pollution control practices from the "Construction Site BMPs Consideration Checklist" and the "Project-Specific Minimum Requirements" identified in the Water Pollution Control Cost Break-Down of this section.

Within 20 working days after the approval of the contract, the Contractor shall submit 3 copies of the draft SWPPP to the Engineer. The Engineer will have 10 working days to review the SWPPP. If revisions are required, as determined by the Engineer, the Contractor shall revise and resubmit the SWPPP within 10 working days of receipt of the Engineer's comments. The Engineer will have 5 working days to review the revisions. Upon the Engineer's approval of the SWPPP, 4 approved copies of the SWPPP, incorporating the required changes, shall be submitted to the Engineer. In order to allow construction activities to proceed, the Engineer may conditionally approve the SWPPP while minor revisions are being completed. In the event the Engineer fails to complete the review within the time allowed, and if, in the opinion of the Engineer, completion of the work is delayed or interfered with by reason of the Engineer's delay in completing the review, the Contractor will be compensated for resulting losses, and an extension of time will be granted, in the same manner as provided for in Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

The Contractor shall prepare an amendment to the SWPPP when there is a change in construction activities or operations which may affect the discharge of pollutants to surface waters, ground waters, municipal storm drain systems, or when the Contractor's activities or operations violate a condition of the Permits, or when directed by the Engineer. Amendments shall identify additional water pollution control practices or revised operations, including those areas or operations not identified in the initially approved SWPPP. Amendments to the SWPPP shall be prepared and submitted for review and approval within a time approved by the Engineer, but in no case longer than the time specified for the initial submittal and review of the SWPPP.

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

#### **COST BREAK-DOWN**

The Contractor shall include a Water Pollution Control Cost Break-Down in the SWPPP which itemizes the contract lump sum for water pollution control work. The Contractor shall use the Water Pollution Control Cost Break-Down provided in this section as the basis for the cost break-down submitted with the SWPPP. The Contractor shall use the Water Pollution Control Cost Break-Down to identify items, quantities and values for water pollution control work, excluding Temporary Water Pollution Control Practices for which there are separate bid items. The Contractor shall be responsible for the accuracy of the quantities and values used in the cost break-down submitted with the SWPPP. Partial payment for the item of water pollution control will not be made until the Water Pollution Control Cost Break-Down is approved by the Engineer.

Line items indicated in the Water Pollution Control Cost Break-Down in this section with a specified Estimated Quantity shall be considered "Project-Specific Minimum Requirements." The Contractor shall incorporate Project-Specific Minimum Requirements with Contractor-designated quantities and values into the Water Pollution Control Cost Break-Down submitted with the SWPPP.

Line items indicated in the Water Pollution Control Cost Break-Down in this section without a specified Estimated Quantity shall be considered by the Contractor for selection to meet the applicable "Minimum Requirements" as defined in the Manuals, or for other water pollution control work as identified in the "Construction Site BMPs Consideration Checklist" presented in the Preparation Manual. In the Water Pollution Control Cost Break-Down submitted with the SWPPP, the Contractor shall list only those water pollution control practices selected for the project, including quantities and values required to complete the work for those items.

The sum of the amounts for the items of work listed in the Water Pollution Control Cost Break-Down shall be equal to the contract lump sum price bid for water pollution control. Overhead and profit, shall be included in the individual items listed in the cost break-down.

**WATER POLLUTION CONTROL COST BREAK-DOWN**

**Contract No. 05-487724**

ITEM	ITEM DESCRIPTION	UNIT	ESTIMATED QUANTITY	VALUE	AMOUNT
SS-3	Hydraulic Mulch	M2			
SS-4	Hydroseeding	M2			
SS-5	Soil Binders	M2			
SS-6	Straw Mulch	M2			
SS-7	Geotextiles, Plastic Covers & Erosion Control Blankets/Mats	M2			
SS-8	Wood Mulching	M2			
SS-9	Earth Dikes/Drainage Swales & Lined Ditches	M			
SS-10	Outlet Protection/Velocity Dissipation Devices	EA			
SS-11	Slope Drains	EA			
SS-12	Streambank Stabilization	LS			
SC-1	Silt Fence	M			
SC-2	Sediment/Desilting Basin	EA			
SC-3	Sediment Trap	EA			
SC-4	Check Dam	EA			
SC-5	Fiber Rolls	M			
SC-6	Gravel Bag Berm	M			
SC-7	Street Sweeping and Vacuuming	LS			
SC-8	Sandbag Barrier	M			
SC-9	Straw Bale Barrier	M			
SC-10	Storm Drain Inlet Protection	EA			
WE-1	Wind Erosion Control	LS			
TC-1	Stabilized Construction Entrance/Exit	EA			
TC-2	Stabilized Construction Roadway	EA			
TC-3	Entrance/Outlet Tire Wash	EA			
NS-1	Water Conservation Practices	LS	Lump Sum		
NS-2	Dewatering Operations	EA			
NS-3	Paving and Grinding Operations	LS			
NS-4	Temporary Stream Crossing	EA			
NS-5	Clear Water Diversion	EA			

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ITEM	ITEM DESCRIPTION	UNIT	ESTIMATED QUANTITY	VALUE	AMOUNT
NS-6	Illicit Connection/Illegal Discharge Detection and Reporting	LS			
NS-7	Potable Water/Irrigation	LS			
NS-8	Vehicle and Equipment Cleaning	LS			
NS-9	Vehicle and Equipment Fueling	LS	Lump Sum		
NS-10	Vehicle and Equipment Maintenance	LS	Lump Sum		
NS-11	Pile Driving Operations	LS			
NS-12	Concrete Curing	LS	Lump Sum		
NS-13	Material and Equipment Use over Water	LS			
NS-14	Concrete Finishing	LS			
NS-15	Structure Demolition/Removal Over or Adjacent to Water	LS			
WM-1	Material Delivery and Storage	LS	Lump Sum		
WM-2	Material Use	LS	Lump Sum		
WM-3	Stockpile Management	LS			
WM-4	Spill Prevention and Control	LS	Lump Sum		
WM-5	Solid Waste Management	LS	Lump Sum		
WM-6	Hazardous Waste Management	LS			
WM-7	Contaminated Soil Management	LS			
WM-8	Concrete Waste Management	LS	Lump Sum		
WM-9	Sanitary/Septic Waste Management	LS	Lump Sum		
WM-10	Liquid Waste Management	LS			

**TOTAL** \_\_\_\_\_

Adjustments in the items of work and quantities listed in the approved cost break-down shall be made when required to address amendments to the SWPPP, except when the adjusted items are paid for as extra work.

No adjustment in compensation will be made to the contract lump sum price paid for water pollution control due to differences between the quantities shown in the approved cost break-down and the quantities required to complete the work as shown on the approved SWPPP. No adjustment in compensation will be made for ordered changes to correct SWPPP work resulting from the Contractor's own operations or from the Contractor's negligence.

The approved cost break-down will be used to determine partial payments during the progress of the work and as the basis for calculating the adjustment in compensation for the item of water pollution control due to increases or decreases of quantities ordered by the Engineer. When an ordered change increases or decreases the quantities of an approved cost break-down item, the adjustment in compensation will be determined in the same manner specified for increases and decreases in the quantity of a contract item of work in conformance with the provisions in Section 4-1.03B, "Increased or Decreased Quantities," of the Standard Specifications. If an ordered change requires a new item which is not on the approved cost break-down, the adjustment in compensation will be determined in the same manner specified for extra work in conformance with Section 4-1.03D, "Extra Work," of the Standard Specifications.

If requested by the Contractor and approved by the Engineer, changes to the water pollution control practices listed in the approved cost break-down, including addition of new water pollution control practices, will be allowed. Changes shall be included in the approved amendment of the SWPPP. If the requested changes result in a net cost increase to the lump sum price for water pollution control, an adjustment in compensation will be made without change to the water pollution control item. The net cost increase to the water pollution control item will be paid for as extra work as provided in Section 4-1.03D, "Extra Work," of the Standard Specifications.

### **SWPPP IMPLEMENTATION**

Unless otherwise specified, upon approval of the SWPPP, the Contractor shall be responsible throughout the duration of the project for installing, constructing, inspecting, maintaining, removing, and disposing of the water pollution control practices specified in the SWPPP and in the amendments. Unless otherwise directed by the Engineer, the Contractor's responsibility for SWPPP implementation shall continue throughout temporary suspensions of work ordered in conformance with the provisions in Section 8-1.05, "Temporary Suspension of Work," of the Standard Specifications. Requirements for installation, construction, inspection, maintenance, removal, and disposal of water pollution control practices shall conform to the requirements in the Manuals and these special provisions.

If the Contractor or the Engineer identifies a deficiency in the implementation of the approved SWPPP or amendments, the deficiency shall be corrected immediately unless requested by the Contractor and approved by the Engineer in writing, but shall be corrected prior to the onset of precipitation. If the Contractor fails to correct the identified deficiency by the date agreed or prior to the onset of precipitation, the project shall be in nonconformance with this section, "Water Pollution Control." Attention is directed to Section 5-1.01, "Authority of Engineer," of the Standard Specifications, and to "Retention of Funds" of this section for possible nonconformance penalties.

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

Implementation of water pollution control practices may vary by season. The Construction Site BMPs Manual and these special provisions shall be followed for control practice selection of year-round, rainy season and non-rainy season water pollution control practices.

### **Year-Round Implementation Requirements**

The Contractor shall have a year-round program for implementing, inspecting and maintaining water pollution control practices for wind erosion control, tracking control, non-storm water management, and waste management and materials pollution control.

The National Weather Service weather forecast shall be monitored and used by the Contractor on a daily basis. An alternative weather forecast proposed by the Contractor may be used if approved by the Engineer. If precipitation is predicted, the necessary water pollution control practices shall be deployed prior to the onset of the precipitation.

Disturbed soil areas shall be considered active whenever the soil disturbing activities have occurred, continue to occur or will occur during the ensuing 21 days. Non-active areas shall be protected as prescribed in the Construction Site BMPs Manual within 14 days of cessation of soil disturbing activities or prior to the onset of precipitation, whichever occurs first.

In order to provide effective erosion control, the Contractor may be directed by the Engineer to apply permanent erosion control in small or multiple units. The Contractor's attention is directed to "Erosion Control (Type D)" of these special provisions.

### **Rainy Season Implementation Requirements**

Soil stabilization and sediment control practices shall be provided throughout the rainy season, defined as between October 15 and April 15.

Throughout the defined rainy season, the active disturbed soil area of the project site shall be not more than 0.53 hectares. The Engineer may approve, on a case-by-case basis, expansions of the active disturbed soil area limit. Soil stabilization and sediment control materials shall be maintained on site sufficient to protect disturbed soil areas. A detailed plan for the mobilization of sufficient labor and equipment shall be maintained to deploy the water pollution control practices required to protect disturbed soil areas prior to the onset of precipitation.

### **Non-Rainy Season Implementation Requirements**

The non-rainy season shall be defined as days outside the defined rainy season. The Contractor's attention is directed to the Construction Site BMPs Manual for soil stabilization and sediment control implementation requirements on disturbed soil areas during the non-rainy season. Disturbed soil areas within the project shall be protected in conformance with the requirements in the Construction Site BMPs Manual with an effective combination of soil stabilization and sediment control.

### **MAINTENANCE**

To ensure the proper implementation and functioning of water pollution control practices, the Contractor shall regularly inspect and maintain the construction site for the water pollution control practices identified in the SWPPP. The construction site shall be inspected by the Contractor as follows:

- A. Prior to a forecast storm.
- B. After a precipitation event which causes site runoff.
- C. At 24 hour intervals during extended precipitation events.
- D. Routinely, a minimum of two weeks outside of the defined rainy season.
- E. Routinely, a minimum of once every week during the defined rainy season.

The Contractor shall use the Storm Water Quality Construction Site Inspection Checklist provided in the Preparation Manual or an alternative inspection checklist provided by the Engineer. One copy of each site inspection record shall be submitted to the Engineer within 24 hours of completing the inspection.

### **REPORTING REQUIREMENTS**

#### **Report of Discharges, Notices or Orders**

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

- A. The date, time, location, nature of the operation, and type of discharge, including the cause or nature of the notice or order.
- B. The water pollution control practices deployed before the discharge event, or prior to receiving the notice or order.
- C. The date of deployment and type of water pollution control practices deployed after the discharge event, or after receiving the notice or order, including additional measures installed or planned to reduce or prevent reoccurrence.
- D. An implementation and maintenance schedule for affected water pollution control practices.

#### **Report of First-Time Non-Storm Water Discharge**

The Contractor shall notify the Engineer at least 3 days in advance of first-time non-storm water discharge events, excluding exempted discharges. The Contractor shall notify the Engineer of the operations causing non-storm water discharges and shall obtain field approval for first-time non-storm water discharges. Non-storm water discharges shall be monitored at first-time occurrences and routinely thereafter.

#### **Annual Certifications**

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

## **SAMPLING AND ANALYTICAL REQUIREMENTS**

The Contractor is required to implement specific sampling and analytical procedures to determine whether BMPs implemented on the construction site are:

- A. preventing pollutants that are known or should be known by permittees to occur on construction sites that are not visually detectable in storm water discharges, to cause or contribute to exceedances of water quality objectives

### **Non-Visible Pollutants**

The project has the potential to discharge non-visible pollutants in storm water from the construction site. The project SWPPP shall contain a Sampling and Analysis Plan (SAP) that describes the sampling and analysis strategy and schedule to be implemented on the project for monitoring non-visible pollutants in conformance with this section.

The SAP shall identify potential non-visible pollutants that are known or should be known to occur on the construction site associated with the following: (1) construction materials, wastes or operations; (2) known existing contamination due to historical site usage; or (3) application of soil amendments, including soil stabilization products, with the potential to alter pH or contribute toxic pollutants to storm water. Planned material and waste storage areas, locations of known existing contamination, and areas planned for application of soil amendments shall be shown on the SWPPP Water Pollution Control Drawings.

The SAP shall identify a sampling schedule for collecting a sample down gradient from the applicable non-visible pollutant source and a sufficiently large uncontaminated control sample during the first two hours of discharge from rain events during daylight hours which result in a sufficient discharge for sample collection. If run-on occurs onto the non-visible pollutant source, a run-on sample that is immediately down gradient of the run-on to the Department's right of way shall be collected. A minimum of 72 hours of dry weather shall occur between rain events to distinguish separate rain events.

The SAP shall state that water quality sampling will be triggered when any of the following conditions are observed during the required storm water inspections conducted before or during a rain event:

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

The SAP shall identify sampling locations for collecting down gradient and control samples, and the rationale for their selection. The control sampling location shall be selected where the sample does not come into contact with materials, wastes or areas associated with potential non-visible pollutants or disturbed soil areas. Sampling locations shall be shown on the SWPPP Water Pollution Control Drawings. Only trained personnel shall collect water quality samples and be identified in the SAP. Qualifications of designated sampling personnel shall describe training and experience, and shall be included in the SWPPP. The SAP shall state monitoring preparation, sample collection procedures, quality assurance/quality control, sample labeling procedures, sample collection documentation, sample shipping and chain of custody procedures, sample numbering system, and reference the construction site health and safety plan.

The SAP shall identify the analytical method to be used for analyzing down gradient and control samples for potential non-visible pollutants on the project. For samples analyzed in the field by sampling personnel, collection, analysis, and equipment calibration shall be in conformance with the Manufacturer's specifications. For samples that will be analyzed by a laboratory, sampling, preservation, and analysis shall be performed by a State-certified laboratory in conformance with 40 CFR 136. The SAP shall identify the specific State-certified laboratory, sample containers, preservation requirements, holding times, and analysis method to be used. A list of State-certified laboratories that are approved by the Department is available at the following internet site: [http://www.dhs.ca.gov/ps/ls/elap/html/lablist\\_county.htm](http://www.dhs.ca.gov/ps/ls/elap/html/lablist_county.htm).

### **Analytical Results and Evaluation**

The Contractor shall submit a hard copy and electronic copy of water quality analytical results and quality assurance/quality control data to the Engineer within 5 days of sampling for field analyses and within 30 days for laboratory analyses. Analytical results shall be accompanied by an evaluation from the Contractor to determine if down gradient samples show elevated levels of the tested parameter relative to levels in the control sample. If down gradient or downstream samples, as applicable, show increased levels, the Contractor will assess the BMPs, site conditions, and surrounding influences to determine the probable cause for the increase. As determined by the assessment, the Contractor will repair or modify BMPs to address increases and amend the SWPPP as necessary. Electronic results (in one of the following file formats: .xls, .txt, .csv, .dbs, or .mdb) shall have at a minimum the following information: sample identification number, contract number, constituent, reported value, method reference, method detection limit, and reported detection limit. The Contractor shall document sample collection during rain events.

Water quality sampling documentation and analytical results shall be maintained with the SWPPP on the project site until a Notice of Completion has been submitted and approved.

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

### **PAYMENT**

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

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

- A. After the SWPPP has been approved by the Engineer, 75 percent of the contract item price for prepare storm water pollution prevention plan will be included in the monthly partial payment estimate.
- B. After acceptance of the contract in conformance with the provisions in Section 7-1.17, "Acceptance of Contract," of the Standard Specifications, payment for the remaining 25 percent of the contract item price for prepare storm water pollution prevention plan will be made in conformance with the provisions in Section 9-1.07.

The contract lump sum price paid for water pollution control shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in installing, constructing, removing, and disposing of water pollution control practices, including non-storm water management, and waste management and materials pollution water pollution control practices, except those for which there is a contract item of work as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Storm water sampling and analysis will be paid for as extra work as provided in Section 4-1.03D, "Extra Work," of the Standard Specifications. No payment will be made for the preparation, collection, analysis, and reporting of storm water samples required where appropriate BMPs are not implemented prior to a rain event, or if a failure of a BMP is not corrected prior to a rain event.

For items identified on the approved Water Pollution Control Cost Break-Down, the cost of maintaining the temporary water pollution control practices shall be divided equally by the State and the Contractor as follows:

#### **Soil Stabilization**

Temporary water pollution control practices except:

- SS-1 Scheduling
- SS-2 Preservation of Existing Vegetation

#### **Sediment Control**

Temporary water pollution control practices except:

- SC-7 Street Sweeping and Vacuuming

#### **Wind Erosion Control**

No sharing of maintenance costs will be allowed.

### **Tracking Control**

TC-1 Stabilized Construction Entrance/Exit.

### **Non-Storm Water Management**

No sharing of maintenance costs will be allowed.

### **Waste Management & Materials Pollution Control**

No sharing of maintenance costs will be allowed.

The division of cost will be made by determining the cost of maintaining water pollution control practices in conformance with the provisions in Section 9-1.03, "Force Account Payment," of the Standard Specifications and paying to the Contractor one-half of that cost. Cleanup, repair, removal, disposal, improper installation, and replacement of water pollution control practices damaged by the Contractor's negligence, shall not be considered as included in the cost for performing maintenance.

The provisions for sharing maintenance costs shall not relieve the Contractor from the responsibility for providing appropriate maintenance on items with no shared maintenance costs.

Full compensation for non-shared maintenance costs of water pollution control practices, as specified in this section, "Water Pollution Control," shall be considered as included in the contract lump sum price paid for water pollution control and no additional compensation will be allowed therefor.

Water pollution control practices for which there is a contract item of work, will be measured and paid for as that contract item of work.

### **10-1.05 TEMPORARY CONCRETE WASHOUT (PORTABLE)**

A portable temporary concrete washout shall be furnished, maintained, and removed as specified in the approved Storm Water Pollution Prevention Plan in conformance with "Water Pollution Control" of these special provisions and as directed by the Engineer.

A portable temporary concrete washout shall consist of a commercially available drum at a minimum size of 208-liter or alternate container upon written approval from the Engineer. The drum shall be stenciled "Concrete Waste Material." The letters shall be black and 100 mm in height on a white background. The top of the stenciling shall be 300 mm from the top of the barrel.

### **PLACEMENT**

A portable temporary concrete washout shall be as follows:

- A. A portable temporary concrete washout shall be in place prior to placement of concrete and shall be located in the immediate area of the concrete work as approved by the Engineer. The temporary concrete washout shall be located away from construction traffic or public access areas. After initial placement, temporary concrete washout shall be moved as needed for concrete construction work. When the temporary concrete washout is no longer required, as determined by the Engineer, it 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.
- B. A sign shall be installed adjacent to each washout at a location determined by the Contractor and approved by the Engineer. Signs shall be installed in conformance with the provisions in Section 12-3.06B, "Portable Signs" of the Standard Specifications. Each portable sign shall consist of a base, framework and a sign panel. The sign panel shall be made out of plywood and shall have a minimum size of 610 mm by 1200 mm. The sign panel shall read "Concrete Washout" with black letters, 150 mm in height, on a white background.
- C. The Contractor shall provide sufficient temporary concrete washout capacity to contain liquid and concrete waste generated by washout operations without seepage or spills.

Maintaining the portable temporary concrete washout shall include removing and disposing of concrete waste. Concrete waste material generated shall be removed each day 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.

The Contractor shall provide the name and location of the disposal facility to the Engineer before disposal of solid and liquid concrete waste. The Contractor shall provide verification that the off-site commercial or noncommercial disposal site has a permit issued by the California Regional Water Quality Control Board (RWQCB). If the disposal site is located outside of the State of California, the Contractor shall provide a copy of the permit issued by the state or local agency having jurisdiction over the disposal site.

When relocating or transporting a portable temporary concrete washout, the portable washout shall be properly secured to prevent spilling of concrete waste material.

## **PAYMENT**

The contract lump sum price paid for temporary concrete washout (portable) shall include full compensation for furnishing all labor, materials, tools, equipment, including the sign, and incidentals, and for doing all the work involved in furnishing, placing, maintaining, repairing, replacing, transporting, disposing of concrete waste, and removing the washout, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

### **10-1.06 PROGRESS SCHEDULE (CRITICAL PATH METHOD)**

The Contractor shall submit to the Engineer practicable critical path method (CPM) progress schedules in conformance with these special provisions. Whenever the term "schedule" is used in this section it shall mean CPM progress schedule.

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. **FLOAT.**—The difference between the earliest and latest allowable start or finish times for an activity.
- H. **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.
- I. **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.
- J. **SCHEDULED COMPLETION DATE.**—The planned project finish date shown on the current accepted schedule.
- K. **TOTAL FLOAT.**—The amount of time that an activity or chain of activities can be delayed before extending the scheduled completion date.
- L. **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 and schedule data as parts of each schedule submittal.

Schedules shall include, but not be limited to, applicable activities that show the following:

- 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.

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.

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 schedule software will be returned to the Contractor within 4 weeks of submittal of the final update schedule. The State will compensate the Contractor in conformance with the provisions in Section 4-1.03D, "Extra Work," of the Standard Specifications for replacement of software which is damaged, lost or stolen after delivery to the Engineer.

#### **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. One 1.44-megabyte 90 mm (3.5 inch) floppy diskette containing the schedule data.

The time-scaled network diagrams shall conform to the following:

- A. Show a continuous flow of information from left to right.
- B. Be based on early start and early finish dates of activities.
- C. Clearly show the primary paths of criticality using graphical presentation.
- D. Be prepared on B-size sheets, 280 mm x 430 mm (11 inch x 17 inch), or larger size.
- E. Include a title block and a timeline on each page.

#### **BASELINE SCHEDULE**

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. Beginning the week the baseline schedule is first submitted, the Contractor shall meet with the Engineer weekly to discuss and resolve schedule issues until the baseline schedule is accepted.

The baseline schedule shall include the entire scope of work and shall show 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 originally provided 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.

### **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 any 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. In addition, the update schedule shall show any proposed schedule modifications including adding or deleting activities or changing activity constraints, durations or logic. The Contractor shall state in writing the reasons for any changes to activities and the critical path that result in a delay to the scheduled completion date compared to the previous accepted schedule.

### **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**

Full compensation for the required schedules and software 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.

### **10-1.07 OBSTRUCTIONS**

Attention is directed to Section 8-1.10, "Utility and Non-Highway Facilities," and Section 15, "Existing Highway Facilities," of the Standard Specifications and these special provisions.

Attention is directed to the existence of certain underground facilities that may require special precautions be taken by the Contractor to protect the health, safety and welfare of workers and of the public. Facilities requiring special precautions include, but are not limited to: conductors of petroleum products, oxygen, chlorine, and toxic or flammable gases; natural gas in pipelines greater than 150 mm in diameter or pipelines operating at pressures greater than 415 kPa (gage); underground electric supply system conductors or cables, with potential to ground of more than 300 V, either directly buried or in a duct or conduit which do not have concentric grounded or other effectively grounded metal shields or sheaths.

The Contractor shall notify the Engineer and the appropriate regional notification center for operators of subsurface installations at least 2 working days, but not more than 14 calendar days, prior to performing any excavation or other work close to any underground pipeline, conduit, duct, wire or other structure. Regional notification centers include, but are not limited to, the following:

Notification Center	Telephone Number
Underground Service Alert-Northern California (USA)	1-800-642-2444 1-800-227-2600
Underground Service Alert-Southern California (USA)	1-800-422-4133 1-800-227-2600

It is anticipated that the following utility facilities will be relocated prior to the dates shown:

Utility	Location	Date
Southern California Edison	3 power poles	9/1/2007

Installation of the following utility facilities will require coordination with the Contractor's operations. The Contractor shall make the necessary arrangements with the utility company, through the Engineer, and shall submit a schedule of work, verified by a representative of the utility company, to the Engineer. The schedule of work shall provide not less than the following number of working days, as defined in Section 8-1.06, "Time of Completion," of the Standard Specifications for the utility company to complete their work:

Utility	Location	Working Days
City of Santa Barbara	22 water meters, 2 air valves, 4 water valves, 4 fire hydrants, 3 sewer manholes	One week
Southern California Gas	5 gas meters, 4 gas valves, 2 gas pull boxes	One week
Verizon	2 telephone pull boxes, 1 telephone manhole	One week
Cox Communication	2 pull boxes	One week
Southern California Edison	1 power pole, 2 guy anchors	One week

#### 10-1.08 MOBILIZATION

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

#### 10-1.09 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 45 kg) 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 kilometer post 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 45 kg) 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/roadHardware/listing.cfm?code=workzone](http://safety.fhwa.dot.gov/roadway_dept/roadHardware/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 45 kg 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](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.

#### **10-1.10 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 100 mm greater than the longer dimension of the post cross-section.

Construction area signs placed within 4.6 m 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.

#### **10-1.11 MAINTAINING TRAFFIC**

Attention is directed to Sections 7-1.08, "Public Convenience," 7-1.09, "Public Safety," and 12, "Construction Area Traffic Control Devices," of the Standard Specifications and to the provisions in "Public Safety" of these special provisions and these special provisions. Nothing in these special provisions shall be construed as relieving the Contractor from the responsibilities specified in Section 7-1.09.

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

Personal vehicles of the Contractor's employees shall not be parked on the traveled way or shoulders including any section closed to public traffic.

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

Whenever work vehicles or equipment are parked on the shoulder within 1.8 m of a traffic lane, the shoulder area shall be closed with fluorescent orange traffic cones or portable delineators placed on a taper in advance of the parked vehicles or equipment and along the edge of the pavement at 7.5-meter intervals to a point not less than 7.5 m past the last vehicle or piece of equipment. A minimum of 9 traffic cones or portable delineators shall be used for the taper. A W20-1 (ROAD WORK AHEAD) or W21-5b (RIGHT/LEFT SHOULDER CLOSED AHEAD) or C24(CA) (SHOULDER WORK AHEAD) sign shall be mounted on a portable sign stand with flags. The sign shall be placed where designated by the Engineer. The sign shall be a minimum of 1200 mm x 1200 mm in size. The Contractor shall immediately restore to the original position and location a traffic cone or delineator that is displaced or overturned, during the progress of work.

A minimum of one paved traffic lane, not less than 3 m wide, shall be open for use by public traffic in each direction of travel.

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

No lane closures, shoulder closures, or other traffic restrictions will be allowed during the first week of Santa Barbara City college's spring, summer, or fall semester. Access must be maintained at all times to Santa Barbara City college from either College Entrance Drive or Loma Alta Drive.

Designated legal holidays are: January 1st, the third Monday in February, the last Monday in May, July 4th, the first Monday in September, November 11th, Thanksgiving Day, and December 25th. When a designated legal holiday falls on a Sunday, the following Monday shall be a designated legal holiday. When November 11th falls on a Saturday, the preceding Friday shall be a designated legal holiday.

Minor deviations from the requirements of this section concerning hours of work which do not significantly change the cost of the work may be permitted upon the written request of the Contractor if, in the opinion of the Engineer, public traffic will be better served and the work expedited. These deviations shall not be adopted by the Contractor until the Engineer has approved the deviations in writing. Other modifications will be made by contract change order.

Chart No. 1 Multilane Lane Requirements																								
Location: SB-225-0.0/6.8 (KP)																								
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
Mondays through Thursdays										1	1	1	1	1	1	1	1							
Fridays										1	1	1	1	1										
Saturdays																								
Sundays																								
Day before designated legal holiday																								
Designated legal holidays																								
<b>Legend:</b> <input type="checkbox"/> 1 One lane open in direction of travel <input type="checkbox"/> No lane closure allowed																								
<b>REMARKS:</b> Portable changeable message signs shall be installed, operated and maintained seven days before lane closure, indicating the date and time of potential traffic delays. Maximum allowable travel delay of 15 minutes. Monitor queue lengths.																								

Pedestrian access facilities shall be provided through construction areas within the right of way as shown on the plans and as specified herein. Pedestrian walkways shall be surfaced with asphalt concrete, portland cement concrete or timber. The surface shall be skid resistant and free of irregularities. Hand railings shall be provided on each side of pedestrian walkways as necessary to protect pedestrian traffic from hazards due to construction operations or adjacent vehicular traffic. Protective overhead covering shall be provided as necessary to insure protection from falling objects and drip from overhead structures.

In addition to the required openings through falsework, pedestrian facilities shall be provided during pile driving, footing, wall, and other bridge construction operations. At least one walkway shall be available at all times. If the Contractor's operations require the closure of one walkway, then another walkway shall be provided nearby, off the traveled roadway.

Railings shall be constructed of wood, S4S, and shall be painted white. Railings and walkways shall be maintained in good condition. Walkways shall be kept clear of obstructions.

Full compensation for providing pedestrian facilities shall be considered as included in the prices paid for the various contract items of work involved and no additional compensation will be allowed therefor.

**10-1.12 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.

### **10-1.13 TRAFFIC CONTROL SYSTEM FOR LANE CLOSURE**

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

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

Each vehicle used to place, maintain and remove components of a traffic control system on multilane highways shall be equipped with a Type II flashing arrow sign which shall be in operation when the vehicle is being used for placing, maintaining or removing components. Vehicles equipped with Type II flashing arrow sign not involved in placing, maintaining or removing components when operated within a stationary lane closure shall only display the caution display mode. The sign shall be controllable by the operator of the vehicle while the vehicle is in motion. The flashing arrow sign shown on the plans shall not be used on vehicles which are being used to place, maintain and remove components of a traffic control system and shall be in place before a lane closure requiring its use is completed.

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

When lane closures are made for work periods only, at the end of each work period, components of the traffic control system, except portable delineators placed along open trenches or excavation adjacent to the traveled way, shall be removed from the traveled way and shoulder. If the Contractor so elects, the components may be stored at selected central locations designated by the Engineer within the limits of the highway right of way.

The contract lump sum price paid for traffic control system shall include full compensation for furnishing all labor (except for flagging costs), materials (including signs), tools, equipment, and incidentals, and for doing all the work involved in placing, removing, storing, maintaining, moving to new locations, replacing, and disposing of the components of the traffic control system shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer. Flagging costs will be paid for as provided in Section 12-2.02, "Flagging Costs," of the Standard Specifications.

The adjustment provisions in Section 4-1.03, "Changes," of the Standard Specifications shall not apply to the item of traffic control system. Adjustments in compensation for traffic control system will be made only for increased or decreased traffic control system required by changes ordered by the Engineer and will be made on the basis of the cost of the increased or decreased traffic control necessary. The adjustment will be made on a force account basis as provided in Section 9-1.03, "Force Account Payment," of the Standard Specifications for increased work and estimated on the same basis in the case of decreased work.

Traffic control system required by work which is classed as extra work, as provided in Section 4-1.03D of the Standard Specifications, will be paid for as a part of the extra work.

#### **10-1.14 PORTABLE CHANGEABLE MESSAGE SIGN**

One Portable changeable message signs shall be furnished, placed, operated, and maintained per direction of traffic, for each lane closure at those locations 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.

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

All portable changeable message signs shall be paid for by a lump sum basis.

The contract lump sum price paid for portable changeable message sign shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in furnishing, placing, operating, maintaining, repairing, replacing, transporting from location to location, and removing the portable changeable message signs, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

#### **10-1.15 TEMPORARY CRASH CUSHION MODULE**

This work shall consist of furnishing, installing, and maintaining sand filled temporary crash cushion modules in groupings or arrays at each location shown on the plans, as specified in these special provisions or where designated by the Engineer. The grouping or array of sand filled modules shall form a complete sand filled temporary crash cushion in conformance with the details shown on the plans and these special provisions.

Attention is directed to "Public Safety" of these special provisions.

Whenever the work or the Contractor's operations establishes a fixed obstacle, the exposed fixed obstacle shall be protected with a sand filled temporary crash cushion. The sand filled temporary crash cushion shall be in place prior to opening the lanes adjacent to the fixed obstacle to public traffic.

Sand filled temporary crash cushions shall be maintained in place at each location, including times when work is not actively in progress. Sand filled temporary crash cushions may be removed during a work period for access to the work provided that the exposed fixed obstacle is 4.6 m or more from a lane carrying public traffic and the temporary crash cushion is reset to protect the obstacle prior to the end of the work period in which the fixed obstacle was exposed. When no longer required, as determined by the Engineer, sand filled temporary crash cushions shall be removed from the site of the work.

At the Contractor's option, the modules for use in sand filled temporary crash cushions shall be either Energite III Inertial Modules, Fitch Inertial Modules or Traffix Sand Barrels manufactured after March 31, 1997, or equal:

- A. Energite III and Fitch Inertial Modules, manufactured by Energy Absorption Systems, Inc., One East Wacker Drive, Chicago, IL 60601-2076. Telephone 1-312-467-6750, FAX 1-800-770-6755
  - 1. Distributor (North): Traffic Control Service, Inc., 8585 Thys Court, Sacramento, CA 95828. Telephone 1-800-884-8274, FAX 1-916-387-9734
  - 2. Distributor (South): Traffic Control Service, Inc., 1881 Betmor Lane, Anaheim, CA 92805. Telephone 1-800-222-8274, FAX 1-714-937-1070
  
- B. Traffix Sand Barrels, manufactured by Traffix Devices, Inc., 220 Calle Pintoresco, San Clemente, CA 92672. Telephone 1-949 361-5663, FAX 1-949 361-9205
  - 1. Distributor (North): United Rentals, Inc., 1533 Berger Drive, San Jose, CA 95112. Telephone 1-408 287-4303, FAX 1-408 287-1929
  - 2. Distributor (South): Statewide Safety & Sign, Inc., P.O. Box 1440, Pismo Beach, CA 93448. Telephone 1-800-559-7080, FAX 1-805 929-5786

Modules contained in each temporary crash cushion shall be of the same type at each location. The color of the modules shall be the standard yellow color, as furnished by the vendor, with black lids. The modules shall exhibit good workmanship free from structural flaws and objectionable surface defects. The modules need not be new. Good used undamaged modules conforming to color and quality of the types specified herein may be utilized. If used Fitch modules requiring a seal are furnished, the top edge of the seal shall be securely fastened to the wall of the module by a continuous strip of heavy duty tape.

Modules shall be filled with sand in conformance with the manufacturer's directions, and to the sand capacity in kilograms for each module shown on the plans. Sand for filling the modules shall be clean washed concrete sand of commercial quality. At the time of placing in the modules, the sand shall contain not more than 7 percent water as determined by California Test 226.

Modules damaged due to the Contractor's operations shall be repaired immediately by the Contractor at the Contractor's expense. Modules damaged beyond repair, as determined by the Engineer, due to the Contractor's operations shall be removed and replaced by the Contractor at the Contractor's expense.

Temporary crash cushion modules shall be placed on movable pallets or frames conforming to the dimensions shown on the plans. The pallets or frames shall provide a full bearing base beneath the modules. The modules and supporting pallets or frames shall not be moved by sliding or skidding along the pavement or bridge deck.

A Type R or P marker panel shall be attached to the front of the crash cushion as shown on the plans, when the closest point of the crash cushion array is within 3.6 m of the traveled way. The marker panel, when required, shall be firmly fastened to the crash cushion with commercial quality hardware or by other methods determined by the Engineer.

At the completion of the project, temporary crash cushion modules, sand filling, pallets or frames, and marker panels shall become the property of the Contractor and shall be removed from the site of the work. Temporary crash cushion modules shall not be installed in the permanent work.

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

#### **10-1.16 EXISTING HIGHWAY FACILITIES**

The work performed in connection with various existing highway facilities shall conform to the provisions in Section 15, "Existing Highway Facilities," of the Standard Specifications and these special provisions.

##### **REMOVE FENCE**

Existing fence, where shown on the plans, shall be removed.

Existing concrete on posts shall be completely removed and disposed of. Full compensation for removing and disposing of posts and concrete on posts shall be considered as included in the contract price paid per meter for remove chain link fence and no separate payment will be made therefor.

##### **REMOVE DRAINAGE FACILITY**

Existing inlets, downdrains, headwalls and culverts where shown on the plans to be removed, shall be completely removed and disposed of.

Existing retaining wall(wood), where shown on the plans to be removed, shall be removed.

### **REMOVE ASPHALT CONCRETE DIKE**

Existing asphalt concrete dike, where shown on the plans to be removed, shall be removed.

Prior to removing the dike, the outside edge of the asphalt concrete to remain in place shall be cut on a neat line to a minimum depth of 50 mm.

The dike shall be removed in such a manner that the surfacing which is to remain in place is not damaged.

The dike shall be disposed of outside the highway right of way in conformance with the provisions in Section 7-1.13 of the Standard Specifications.

### **REMOVE ROADSIDE SIGN**

Existing roadside signs, at those locations shown on the plans to be removed, shall be removed and disposed of.

Existing roadside signs shall not be removed until replacement signs have been installed or until the existing signs are no longer required for the direction of public traffic, unless otherwise directed by the Engineer.

### **RECONSTRUCT CHAIN LINK FENCE AND GATE**

Existing chain link fence and gates, at the locations shown on the plans, shall be removed and reconstructed.

Fence removed in excess of that required for reconstructing chain link fence shall be disposed of. Full compensation for removing and disposing of excess fence shall be considered as included in the contract price paid per meter for reconstruct chain link fence and no separate payment will be made therefor.

### **RECONSTRUCT METAL BEAM GUARD RAILING**

Existing metal beam guard railing, where shown on the plans to be reconstructed, shall be reconstructed.

Attention is directed to "Order of Work" of these special provisions regarding the reconstruction of metal beam guard railing at those locations exposed to public traffic.

### **RESET MAILBOX**

Existing mailboxes shall be removed and reset in conformance with the details shown on the plans.

During construction operations, the mailboxes shall be moved as necessary to clear the way for the Contractor's operations, but shall be accessible for delivery at all times. During construction, the mailboxes shall be installed on posts set in the ground or the mailboxes may be installed on temporary supports approved by the Engineer.

When construction is complete, the mailboxes shall be installed in the final position on new redwood posts.

Redwood posts shall conform to the provisions for sign posts in Section 56-2.02B, "Wood Posts," of the Standard Specifications.

The space around the posts shall be backfilled with earthy material. The backfill material shall be placed in layers approximately 100 mm thick and each layer shall be moistened and thoroughly compacted.

Existing posts, mounts, and hardware 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.

A multiple-box installation shall consist of 2 mailboxes installed on a single post. Each multi-box installation shall be considered as 2 units for payment purposes.

Newspaper boxes on individual posts will be considered as mailboxes for measurement and payment.

Newspaper boxes attached to existing mailbox posts shall be removed and fastened to the new mailbox posts and no separate payment will be made therefor.

Full compensation for disposing of existing posts, mounts, and hardware; moving and maintaining the mailboxes (regardless of the number of moves required); and for furnishing new posts, planks, and hardware shall be considered as included in the contract unit price paid for reset mailbox and no additional compensation will be allowed therefor.

### **RESET ROADSIDE SIGN**

Existing roadside signs, where shown on the plans to be reset, shall be removed and reset.

Each roadside sign shall be reset on the same day that the sign is removed.

Two holes shall be drilled in each existing post as required to provide the breakaway feature shown on the plans.

### **ADJUST FRAME AND GRATE TO GRADE**

Frames, covers and grates of existing drainage inlets shall be adjusted to grade in conformance with the provisions in Section 15-2.05, "Reconstruction," of the Standard Specifications.

## **REMOVE ASPHALT CONCRETE**

Existing asphalt concrete shown on the plans to be removed, shall be removed to a depth of at least 150 mm below the grade of the existing surfacing. Resulting holes and depressions shall be backfilled with earthy material to the lines and grade established by the Engineer.

The material removed shall be disposed of outside the highway right of way in conformance with the provisions in Section 15-2.03, "Disposal," of the Standard Specifications.

Removing asphalt concrete will be measured by the square meter.

The contract unit price paid per square meter for remove asphalt concrete shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in removing asphalt concrete, as shown on the plans, as specified in these special provisions, and as directed by the Engineer.

## **REMOVE CONCRETE**

Concrete, where shown on the plans to be removed, shall be removed.

The pay quantities of concrete to be removed will be measured by the cubic meter, measured before and during removal operations.

Concrete removed 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.

## **10-1.17 CLEARING AND GRUBBING**

Clearing and grubbing shall conform to the provisions in Section 16, "Clearing and Grubbing," of the Standard Specifications and these special provisions.

Vegetation shall be cleared and grubbed only within the excavation and embankment slope lines.

At locations where there is no grading adjacent to a bridge or other structure, clearing and grubbing of vegetation shall be limited to 1.5 m outside the physical limits of the bridge or structure.

Existing vegetation outside the areas to be cleared and grubbed shall be protected from injury or damage resulting from the Contractor's operations.

Activities controlled by the Contractor, except cleanup or other required work, shall be confined within the graded areas of the roadway.

Nothing herein shall be construed as relieving the Contractor of the Contractor's responsibility for final cleanup of the highway as provided in Section 4-1.02, "Final Cleaning Up," of the Standard Specifications.

## **10-1.18 PRUNE EXISTING TREE ROOTS**

Existing trees shown on the plans to be root pruned shall be pruned in conformance with the provisions in Section 20-4.055, "Pruning," of the Standard Specifications and American National Standards Institute (ANSI) A300-1995, "Tree, Shrub and Other Woody Plant Maintenance-Standard Practices," and "Tree-Pruning Guidelines," (1995) published by the International Society of Arboriculture (ISBN 1-881956-07-5) and these special provisions.

Attention is directed to the provisions in Section 7-1.11, "Preservation of Property," of the Standard Specifications and these special provisions.

Root pruning shall include the following:

- A. Root pruning shall be performed by a sharp instrument at right angles to the elongated growth of the root. Root damage such as root splitting, bruising, and cracking is not allowed.
- B. Existing trees adjacent to concrete sidewalk, access ramps, driveway aprons, curb and gutter shall have their roots ground down to clear new concrete by 200 mm minimum vertically and 100 to 200 mm minimum horizontally, unless otherwise directed by the engineer. All root pruning shall be observed by a ISA certified arborist.
- C. Earthwork in the vicinity of trees shall be observed by a ISA certified arborist.
- D. When tree roots are encountered during earthwork operations, excavation shall be done by hand.
- E. Roots that are 40 mm or larger shall be pruned cleanly with the appropriate cutting tools. All root pruning shall be observed by a certified Arborist.

If the stability or survival of a tree is in question, approval from the engineer is required prior to any root pruning.

Tree seal compounds shall not be used to cover pruning cuts.

Removed pruned materials shall be disposed of outside the highway right of way as provided in Section 7-1.13 of the Standard Specifications or chipped and spread within the highway right of way as directed by the Engineer.

The quantity of prune existing tree roots will be measured by the unit as determined from actual count in place.

The contract price paid for prune existing tree roots, shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in pruning existing tree roots, complete in place, including certified Arborist, and removing and disposing of pruned materials as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

#### **10-1.19 REMOVE TREE**

Remove tree shall conform to Section 20-4.025, "Roadside Clearing," of the Standard Specifications and these special provisions. Trees shall be removed where shown on the plans.

Attention is directed to "Order of Work" of these special provisions. Existing trees shall be removed prior to performing other work within the location of the existing trees.

Stumps shall be ground to a depth of 300 mm below finish grade. Holes resulting from the removal of trees shall be backfilled the same day the trees are removed. Soil from the surrounding area may be used to backfill these holes. The backfill shall be graded to conform with the adjacent existing grade.

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

The quantity of remove tree will be measured by the unit as determined from actual count in place.

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

#### **10-1.20 EARTHWORK**

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

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

Where a portion of the existing surfacing is to be removed, the outline of the area to be removed shall be cut on a neat line with a power-driven saw to a minimum depth of 50 mm before removing the surfacing. Full compensation for cutting the existing surfacing shall be considered as included in the contract price paid per cubic meter for roadway excavation and no additional compensation will be allowed therefor.

Reinforcement or metal attached to reinforced concrete rubble placed in embankments shall not protrude above the grading plane. Prior to placement within 0.6-m below the grading plane of embankments, reinforcement or metal shall be trimmed to no greater than 20 mm from the face of reinforced concrete rubble. Full compensation for trimming reinforcement or metal shall be considered as included in the contract prices paid per cubic meter for the types of excavation shown in the Engineer's estimate, or the contract prices paid for furnishing and placing imported borrow or embankment material, as the case may be, and no additional compensation will be allowed therefor.

Imported borrow shall be mineral material including rock, sand, gravel, or earth. The Contractor shall not use man-made refuse in imported borrow including:

- A. Portland cement concrete,
- B. Asphalt concrete,
- C. Material planed from roadway surfaces,
- D. Residue from grooving or grinding operations,
- E. Metal,
- F. Rubber,
- G. Mixed debris,
- H. Rubble

#### **10-1.21 CONTROLLED LOW STRENGTH MATERIAL**

Controlled low strength material shall consist of a workable mixture of aggregate, cementitious materials, and water and shall conform to the provisions for slurry cement backfill in Section 19-3.062, "Slurry Cement Backfill," of the Standard Specifications and these special provisions.

At the option of the Contractor, controlled low strength material may be used as structure backfill for pipe culverts, except that controlled low strength material shall not be used as structure backfill for culverts having a diameter or span greater than 6.1 m.

When controlled low strength material is used for structure backfill, the width of the excavation shown on the plans may be reduced so that the clear distance between the outside of the pipe and the side of the excavation, on each side of the pipe, is a minimum of 300 mm. This minimum may be reduced to 150 mm when the height of cover is less than or equal to 6.1 m or the pipe diameter or span is less than 1050 mm.

Controlled low strength material in new construction shall not be permanently placed higher than the basement soil. For trenches in existing pavements, permanent placement shall be no higher than the bottom of the existing pavement permeable drainage layer. If a drainage layer does not exist, permanent placement in existing pavements shall be no higher than 25 mm below the bottom of the existing asphalt concrete surfacing or no higher than the top of base below the existing portland cement concrete pavement. The minimum height that controlled low strength material shall be placed, relative to the culvert invert, is 0.5 diameter or 0.5 height for rigid culverts and 0.7 diameter or 0.7 height for flexible culverts.

When controlled low strength material is proposed for use, the Contractor shall submit a mix design and test data to the Engineer for approval prior to excavating the trench for which controlled low strength material is proposed for use. The test data and mix design shall provide for the following:

- A. A 28-day compressive strength between 345 kPa and 690 kPa for pipe culverts having a height of cover of 6.1 m or less and a minimum 28-day compressive strength of 690 kPa for pipe culverts having a height of cover greater than 6.1 m. Compressive strength shall be determined in conformance with the requirements in ASTM Designation: D 4832.
- B. Cement shall be any type of portland cement conforming to the requirements in ASTM Designation: C 150; or any type of blended hydraulic cement conforming to the requirements in ASTM Designation: C 595M or the physical requirements in ASTM Designation: C 1157M. Testing of cement will not be required.
- C. Admixtures may be used in conformance with the provisions in Section 90-4, "Admixtures," of the Standard Specifications. Chemical admixtures containing chlorides as Cl in excess of one percent by mass of admixture, as determined in conformance with the requirements of California Test 415, shall not be used. If an air-entraining admixture is used, the maximum air content shall be limited to 20 percent. Mineral admixtures shall be used at the Contractor's option.

Materials for controlled low strength material shall be thoroughly machine-mixed in a pugmill, rotary drum or other approved mixer. Mixing shall continue until the cementitious material and water are thoroughly dispersed throughout the material. Controlled low strength material shall be placed in the work within 3 hours after introduction of the cement to the aggregates.

When controlled low strength material is to be placed within the traveled way or otherwise to be covered by paving or embankment materials, the material shall achieve a maximum indentation diameter of 76 mm prior to covering and opening to public traffic. Penetration resistance shall be measured in conformance with the requirements in ASTM Designation: D 6024.

Controlled low strength material used as structure backfill for pipe culverts will be considered structure backfill for compensation purposes.

#### **10-1.22. ROOT BARRIERS**

Root barrier work shall consist of providing and installing root barriers as shown on the plans and as specified in these special provisions.

##### **MATERIALS**

Root barriers shall be an injection molded or extruded modular component made of high density polypropylene or polyethylene plastic. Panels shall have a minimum thickness of 2 mm. Each panel shall have molded vertical ribs (four minimum) and locking strips or integral male/female sliding locks. Vertical root-deflecting ribs or channels shall be between 12.7 mm-0.20 mm high, perpendicular to the panel, and between 150 mm-200 mm apart. Panels shall be a minimum of 600 mm wide x 600 mm deep.

##### **APPLICATION**

Root barriers shall be installed between existing trees and concrete sidewalk as shown on the plans. Panels shall be installed flush with the finished grade and joined with locking strips or integral male/female sliding locks. Locking mechanism shall have a close tolerance to restrict slippage between panels. Barriers shall be installed with root deflectors facing inward.

##### **MEASUREMENT AND PAYMENT**

Root barriers shall be measured by the total length of panels installed in the field, measured parallel to the ground surface.

The contract price paid per meter for root barriers shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in installing root barriers, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

**10-1.23 EROSION CONTROL (TYPE D)**

Erosion control (Type D) shall conform to the provisions in Section 20-3, "Erosion Control," of the Standard Specifications and these special provisions and shall consist of applying erosion control materials to embankment and excavation slopes and other areas disturbed by construction activities.

If the slope on which the erosion control is to be placed is finished during the rainy season as specified in "Water Pollution Control" of these special provisions, the erosion control shall be applied immediately to the slope.

Prior to installing erosion control materials, soil surface preparation shall conform to the provisions in Section 19-2.05, "Slopes," of the Standard Specifications, except that rills and gullies exceeding 50 mm in depth or width shall be leveled. Vegetative growth, temporary erosion control materials, and other debris shall be removed from areas to receive erosion control.

**MATERIALS**

Materials shall conform to the provisions in Section 20-2, "Materials," of the Standard Specifications and these special provisions.

**Seed**

Seed shall conform to the provisions in Section 20-2.10, "Seed," of the Standard Specifications. Individual seed species shall be measured and mixed in the presence of the Engineer.

Seed shall be delivered to the project site in unopened separate containers with the seed tag attached. Containers without a seed tag attached will not be accepted.

A sample of approximately 30 g of seed will be taken from each seed container by the Engineer.

**Legume Seed**

Legume seed shall be pellet-inoculated or industrial-inoculated and shall conform to the following:

- A. Inoculated seed shall be inoculated in conformance with the provisions in Section 20-2.10, "Seed," of the Standard Specifications.
- B. Inoculated seed shall have a calcium carbonate coating.
- C. Industrial-inoculated seed shall be inoculated with Rhizobia and coated using an industrial process by a manufacturer whose principal business is seed coating and seed inoculation.
- D. Industrial-inoculated seed shall be sown within 180 calendar days after inoculation.
- E. Legume seed shall consist of the following:

**LEGUME SEED**

Botanical Name (Common Name)	Percent Germination (Minimum)	Kilograms Pure Live Seed Per Hectare (Slope Measurement)
Lupinus bicolor (Miniature Lupine)	80	5
Trifolium gracilentum (Pinpoint Clover)	45	2

**Non-Legume Seed**

Non-legume seed shall consist of the following:

**NON-LEGUME SEED**

Botanical Name (Common Name)	Percent Germination (Minimum)	Kilograms Pure Live Seed Per Hectare (Slope Measurement)
Bromus carinatus (California Brome)	80	10
Leymus triticoides (Creeping Wildrye)	80	16
Vulpia microstachys (Small Fescue)	60	4

**Compost**

At the option of the Contractor, compost may be either A, B, or any combination of both:

- A. Green material consisting of chipped, shredded, or ground vegetation; or clean processed recycled wood products.
- B. Class A , exceptional quality biosolids composts, conforming to the requirements in United States Environmental Protection Agency (EPA) regulation 40 CFR, Part 503c.

Compost shall not contain paint, petroleum products, herbicides, fungicides or other chemical residues harmful to plant or animal life. Other deleterious material, plastic, glass, metal or rock shall not exceed 0.1-percent by weight or volume.

Compost shall be thermophilically processed for 15 days. During this process, the compost shall be maintained at minimum internal temperature of 55°C and be thoroughly turned at least 5 times. A 90-day curing period shall follow the thermophilic process.

Compost shall be screened through a screen no larger than 12 mm.

Compost shall measure at least 6 on the maturity and stability scale with a Solvita test kit.

A Certificate of Compliance for compost shall be furnished to the Engineer in conformance with the provisions in Section 6-1.07, "Certificates of Compliance," of the Standard Specifications. The Certificate of Compliance shall state the Solvita maturity and stability scale test result of the compost.

**Stabilizing Emulsion**

Stabilizing emulsion shall conform to the provisions in Section 20-2.11, "Stabilizing Emulsion," of the Standard Specifications and these special provisions.

Stabilizing emulsion shall be in a dry powder form, may be reemulsifiable, and shall be a processed organic adhesive used as a soil tackifier.

**APPLICATION**

Erosion control materials shall be applied in separate applications in the following sequence:

- A. The following mixture in the rates indicated shall be applied with hydro-seeding equipment within 60 minutes after the seed has been added to the mixture:

Material	Kilograms Per Hectare (Slope Measurement)
Legume Seed	7
Non-Legume Seed	30
Fiber	500

Material	Cubic Meter Per Hectare (Slope Measurement)
Compost	1

- B. The Contractor may dry apply compost at the total of the rates specified in the preceding table and the following table instead of including it as part of the hydro-seeding operations. In areas where the compost is dry applied, all compost for that area shall be applied before the next operation.
- C. The following mixture in the rates indicated shall be applied with hydro-seeding equipment:

Material	Kilograms Per Hectare (Slope Measurement)
Fiber	1500
Stabilizing Emulsion (Solids)	125

Material	Cubic Meter Per Hectare (Slope Measurement)
Compost	3

The ratio of total water to total stabilizing emulsion in the mixture shall be as recommended by the manufacturer. The rates of erosion control materials may be changed by the Engineer to meet field conditions.

**MEASUREMENT AND PAYMENT**

Compost (erosion control) will be measured by the cubic meter in the vehicle at the point of delivery in conformance with the provisions in Section 9-1.01, "Measurement of Quantities," of the Standard Specifications.

The contract price paid per cubic meter for compost (erosion control) shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in applying compost for erosion control, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

**10-1.24 GRIND EXISTING ASPHALT CONCRETE PAVEMENT**

Grinding existing asphalt concrete pavement shall conform to the provisions in Section 42-2, "Grinding," of the Standard Specifications and these special provisions.

**10-1.25 GRIND EXISTING CONCRETE LIP**

Grinding existing portland cement concrete lip shall conform to the provisions in Section 42-2, "Grinding," of the Standard Specifications and these special provisions.

**10-1.26 PILING**

**GENERAL**

Piling shall conform to the provisions in Section 49, "Piling," of the Standard Specifications, and these special provisions.

Unless otherwise specified, welding of any work performed in conformance with the provisions in Section 49, "Piling," of the Standard Specifications, shall be in conformance with the requirements in AWS D1.1.

Attention is directed to "Welding" of these special provisions.

Difficult pile installation is anticipated due to the presence of medium dense sand layers, sound control, vibration monitoring and traffic control.

**CAST-IN-DRILLED-HOLE CONCRETE PILES**

Cast-in-drilled-hole concrete piling shall conform to the provisions in Section 49-4, "Cast-In-Place Concrete Piles," of the Standard Specifications and these special provisions.

The provisions of "Welding" of these special provisions shall not apply to temporary steel casings.

Cast-in-drilled-hole concrete piles 600 mm in diameter or larger may be constructed by excavation and depositing concrete under slurry.

**Materials**

Concrete deposited under slurry shall have a nominal penetration equal to or greater than 90 mm. Concrete shall be proportioned to prevent excessive bleed water and segregation.

Concrete deposited under slurry shall contain not less than 400 kg of cementitious material per cubic meter.

The combined aggregate grading used in concrete for cast-in-drilled-hole concrete piling shall be either the 25-mm maximum grading, the 12.5-mm maximum grading, or the 9.5-mm maximum grading and shall conform to the requirements in Section 90-3 "Aggregate Gradings," of the Standard Specifications.

**Mineral Slurry**

Mineral slurry shall be mixed and thoroughly hydrated in slurry tanks, and slurry shall be sampled from the slurry tanks and tested before placement in the drilled hole.

Slurry shall be recirculated or continuously agitated in the drilled hole to maintain the specified properties.

Recirculation shall include removal of drill cuttings from the slurry before discharging the slurry back into the drilled hole. When recirculation is used, the slurry shall be sampled and tested at least every 2 hours after beginning its use until tests show that the samples taken from the slurry tank and from near the bottom of the hole have consistent specified properties. Subsequently, slurry shall be sampled at least twice per shift as long as the specified properties remain consistent.

Slurry that is not recirculated in the drilled hole shall be sampled and tested at least every 2 hours after beginning its use. The slurry shall be sampled mid-height and near the bottom of the hole. Slurry shall be recirculated when tests show that the samples taken from mid-height and near the bottom of the hole do not have consistent specified properties.

Slurry shall also be sampled and tested prior to final cleaning of the bottom of the hole and again just prior to placing concrete. Samples shall be taken from mid-height and near the bottom of the hole. Cleaning of the bottom of the hole and placement of the concrete shall not start until tests show that the samples taken from mid-height and near the bottom of the hole have consistent specified properties.

Mineral slurry shall be tested for conformance to the requirements shown in the following table:

MINERAL SLURRY		
PROPERTY	REQUIREMENT	TEST
Density (kg/m <sup>3</sup> ) - before placement in the drilled hole - during drilling  - prior to final cleaning - immediately prior to placing concrete	1030* to 1110*   1030* to 1200*	Mud Weight (Density) API 13B-1 Section 1
Viscosity (seconds/liter)  bentonite  attapulgate	  29 to 53  29 to 42	Marsh Funnel and Cup API 13B-1 Section 2.2
pH	8 to 10.5	Glass Electrode pH Meter or pH Paper
Sand Content (percent)  - prior to final cleaning - immediately prior to placing concrete	  less than or equal to 4.0	Sand API 13B-1 Section 5
*When approved by the Engineer, slurry may be used in salt water, and the allowable densities may be increased up to 32 kg/m <sup>3</sup> . Slurry temperature shall be at least 4°C when tested.		

Any caked slurry on the sides or bottom of hole shall be removed before placing reinforcement. If concrete is not placed immediately after placing reinforcement, the reinforcement shall be removed and cleaned of slurry, the sides of the drilled hole cleaned of caked slurry, and the reinforcement again placed in the hole for concrete placement.

**Synthetic Slurry**

Synthetic slurries shall be used in conformance with the manufacturer's recommendations and these special provisions. The following synthetic slurries may be used:

PRODUCT	MANUFACTURER
SlurryPro CDP	KB Technologies Ltd. 3648 FM 1960 West Suite 107 Houston, TX 77068 (800) 525-5237
Super Mud	PDS Company c/o Champion Equipment Company 8140 East Rosecrans Ave. Paramount, CA 90723 (562) 634-8180
Shore Pac GCV	CETCO Drilling Products Group 1350 West Shure Drive Arlington Heights, IL 60004 (847) 392-5800
Novagel Polymer	Geo-Tech Drilling Fluids 220 N. Zapata Hwy, Suite 11A Laredo, TX 78043 (210) 587-4758

Inclusion of a synthetic slurry on the above list may be obtained by meeting the Department's requirements for synthetic slurries. The requirements can be obtained from the Office of Structure Design, P.O. Box 942874, Sacramento, CA 94274-0001.

Synthetic slurries listed may not be appropriate for a given site.

Synthetic slurries shall not be used in holes drilled in primarily soft or very soft cohesive soils as determined by the Engineer.

A manufacturer's representative, as approved by the Engineer, shall provide technical assistance for the use of their product, shall be at the site prior to introduction of the synthetic slurry into a drilled hole, and shall remain at the site until released by the Engineer.

Synthetic slurries shall be sampled and tested at both mid-height and near the bottom of the drilled hole. Samples shall be taken and tested during drilling as necessary to verify the control of the properties of the slurry. Samples shall be taken and tested when drilling is complete, but prior to final cleaning of the bottom of the hole. When samples are in conformance with the requirements shown in the following tables for each slurry product, the bottom of the hole shall be cleaned and any loose or settled material removed. Samples shall be obtained and tested after final cleaning and immediately prior to placing concrete.

SlurryPro CDP synthetic slurries shall be tested for conformance to the requirements shown in the following table:

SLURRYPRO CDP KB Technologies Ltd.		
PROPERTY	REQUIREMENT	TEST
Density (kg/m <sup>3</sup> ) - during drilling  - prior to final cleaning - just prior to placing concrete	less than or equal to 1075*  less than or equal to 1025*	Mud Weight (Density) API 13B-1 Section 1
Viscosity (seconds/liter) - during drilling  -prior to final cleaning - just prior to placing concrete	53 to 127  less than or equal to 74	Marsh Funnel and Cup API 13B-1 Section 2.2
pH	6 to 11.5	Glass Electrode pH Meter or pH Paper
Sand Content (percent) - prior to final cleaning - just prior to placing concrete	less than or equal to 0.5	Sand API 13B-1 Section 5
<p>*When approved by the Engineer, slurry may be used in salt water, and the allowable densities may be increased up to 32 kg/m<sup>3</sup>.</p> <p>Slurry temperature shall be at least 4°C when tested.</p>		

Super Mud synthetic slurries shall be tested for conformance to the requirements shown in the following table:

SUPER MUD PDS Company		
PROPERTY	REQUIREMENT	TEST
Density (kg/m <sup>3</sup> ) - prior to final cleaning - just prior to placing concrete	less than or equal to 1025*	Mud Weight (Density) API 13B-1 Section 1
Viscosity (seconds/liter) - during drilling - prior to final cleaning - just prior to placing concrete	34 to 64 less than or equal to 64	Marsh Funnel and Cup API 13B-1 Section 2.2
pH	8 to 10.0	Glass Electrode pH Meter or pH Paper
Sand Content (percent) - prior to final cleaning -just prior to placing concrete	less than or equal to 0.5	Sand API 13B-1 Section 5
*When approved by the Engineer, slurry may be used in salt water, and the allowable densities may be increased up to 32 kg/m <sup>3</sup> . Slurry temperature shall be at least 4°C when tested.		

Shore Pac GCV synthetic slurries shall be tested for conformance to the requirements shown in the following table:

Shore Pac GCV CETCO Drilling Products Group		
PROPERTY	REQUIREMENT	TEST
Density (kg/m <sup>3</sup> ) - prior to final cleaning - just prior to placing concrete	less than or equal to 1025*	Mud Weight (Density) API 13B-1 Section 1
Viscosity (seconds/liter) - during drilling  - prior to final cleaning - just prior to placing concrete	35 to 78  less than or equal to 60	Marsh Funnel and Cup API 13B-1 Section 2.2
pH	8.0 to 11.0	Glass Electrode pH Meter or pH Paper
Sand Content (percent) - prior to final cleaning -just prior to placing concrete	less than or equal to 0.5	Sand API 13B-1 Section 5
*When approved by the Engineer, slurry may be used in salt water, and the allowable densities may be increased up to 32 kg/m <sup>3</sup> . Slurry temperature shall be at least 4°C when tested.		

Novagel Polymer synthetic slurries shall be tested for conformance to the requirements shown in the following table:

NOVAGEL POLYMER Geo-Tech Drilling Fluids		
PROPERTY	REQUIREMENT	TEST
Density (kg/m <sup>3</sup> ) - during drilling  - prior to final cleaning - just prior to placing concrete	less than or equal to 1075*  less than or equal to 1025*	Mud Weight (Density) API 13B-1 Section 1
Viscosity (seconds/liter) - during drilling  - prior to final cleaning - just prior to placing concrete	48 to 110  less than or equal to 110	Marsh Funnel and Cup API 13B-1 Section 2.2
pH	6.0 to 11.5	Glass Electrode pH Meter or pH Paper
Sand Content (percent) - prior to final cleaning -just prior to placing concrete	less than or equal to 0.5	Sand API 13B-1 Section 5
<p>*When approved by the Engineer, slurry may be used in salt water, and the allowable densities may be increased up to 32 kg/m<sup>3</sup>. Slurry temperature shall be at least 4°C when tested.</p>		

**Water Slurry**

At the option of the Contractor, water may be used as slurry when casing is used for the entire length of the drilled hole. Water slurry shall be tested for conformance to the requirements shown in the following table:

WATER SLURRY		
PROPERTY	REQUIREMENT	TEST
Density (kg/m <sup>3</sup> ) - prior to final cleaning - just prior to placing concrete	1017 *	Mud Weight (Density) API 13B-1 Section 1
Sand Content (percent) - prior to final cleaning -just prior to placing concrete	less than or equal to 0.5	Sand API 13B-1 Section 5
*When approved by the Engineer, salt water slurry may be used, and the allowable densities may be increased up to 32 kg/m <sup>3</sup> .		

**Construction**

The Contractor shall submit a placing plan to the Engineer for approval prior to producing the test batch for cast-in-drilled-hole concrete piling and at least 10 working days prior to constructing piling. The plan shall include complete descriptions, details, and supporting calculations as listed below:

A. Requirements for all cast-in-drilled hole concrete piling:

1. Concrete mix design, certified test data, and trial batch reports.
2. Drilling or coring methods and equipment.
3. Proposed method for casing installation and removal when necessary.
4. Plan view drawing of pile showing reinforcement and inspection pipes, if required.
5. Methods for placing, positioning, and supporting bar reinforcement.
6. Methods and equipment for accurately determining the depth of concrete and actual and theoretical volume placed, including effects on volume of concrete when any casings are withdrawn.
7. Methods and equipment for verifying that the bottom of the drilled hole is clean prior to placing concrete.
8. Methods and equipment for preventing upward movement of reinforcement, including the Contractor's means of detecting and measuring upward movement during concrete placement operations.

B. Additional requirements when concrete is placed under slurry:

1. Concrete batching, delivery, and placing systems, including time schedules and capacities therefor. Time schedules shall include the time required for each concrete placing operation at each pile.
2. Concrete placing rate calculations. When requested by the Engineer, calculations shall be based on the initial pump pressures or static head on the concrete and losses throughout the placing system, including anticipated head of slurry and concrete to be displaced.
3. Suppliers' test reports on the physical and chemical properties of the slurry and any proposed slurry chemical additives, including Material Safety Data Sheet.
4. Slurry testing equipment and procedures.
5. Methods of removal and disposal of excavation, slurry, and contaminated concrete, including removal rates.
6. Methods and equipment for slurry agitating, recirculating, and cleaning.

In addition to compressive strength requirements, the consistency of the concrete to be deposited under slurry shall be verified before use by producing a test batch. The test batch shall be produced and delivered to the project under conditions and in time periods similar to those expected during the placement of concrete in the piles. Concrete for the test batch shall be placed in an excavated hole or suitable container of adequate size to allow for testing as specified herein. Depositing of test batch concrete under slurry will not be required. In addition to meeting the specified nominal penetration, the test batch shall meet the following requirements:

- A. For piles where the time required for each concrete placing operation, as submitted in the placing plan, will be 2 hours or less, the test batch shall demonstrate that the proposed concrete mix design achieves either a penetration of at least 50 mm or a slump of at least 125 mm after twice that time has elapsed.
- B. For piles where the time required for each concrete placing operation, as submitted in the placing plan, will be more than 2 hours, the test batch shall demonstrate that the proposed concrete mix design achieves either a penetration of at least 50 mm or a slump of at least 125 mm after that time plus 2 hours has elapsed.

The time period shall begin at the start of placement. The concrete shall not be vibrated or agitated during the test period. Penetration tests shall be performed in conformance with the requirements in California Test 533. Slump tests shall be performed in conformance with the requirements in ASTM Designation: C 143. Upon completion of testing, the concrete 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.

The concrete deposited under slurry shall be carefully placed in a compact, monolithic mass and by a method that will prevent washing of the concrete. Concrete deposited under slurry need not be vibrated. Placing concrete shall be a continuous operation lasting not more than the time required for each concrete placing operation at each pile, as submitted in the placing plan, unless otherwise approved in writing by the Engineer. The concrete shall be placed with concrete pumps and delivery tube system of adequate number and size to complete the placing of concrete in the time specified. The delivery tube system shall consist of one of the following:

- A. A tremie tube or tubes, each of which are at least 250 mm in diameter, fed by one or more concrete pumps.
- B. One or more concrete pump tubes, each fed by a single concrete pump.

The delivery tube system shall consist of watertight tubes with sufficient rigidity to keep the ends always in the mass of concrete placed. If only one delivery tube is utilized to place the concrete, the tube shall be placed near the center of the drilled hole. Multiple tubes shall be uniformly spaced in the hole. Internal bracing for the steel reinforcing cage shall accommodate the delivery tube system. Tremies shall not be used for piles without space for a 250-mm tube.

Spillage of concrete into the slurry during concrete placing operations shall not be allowed. Delivery tubes shall be capped with a watertight cap, or plugged above the slurry level with a good quality, tight fitting, moving plug that will expel the slurry from the tube as the tube is charged with concrete. The cap or plug shall be designed to be released as the tube is charged. The pump discharge or tremie tube shall extend to the bottom of the hole before charging the tube with concrete. After charging the delivery tube system with concrete, the flow of concrete through a tube shall be induced by slightly raising the discharge end. During concrete placement, the tip of the delivery tube shall be maintained as follows to prevent reentry of the slurry into the tube. Until at least 3 m of concrete has been placed, the tip of the delivery tube shall be within 150 mm of the bottom of the drilled hole, and then the embedment of the tip shall be maintained at least 3 m below the top surface of the concrete. Rapid raising or lowering of the delivery tube shall not be permitted. If the seal is lost or the delivery tube becomes plugged and must be removed, the tube shall be withdrawn, the tube cleaned, the tip of the tube capped to prevent entrance of the slurry, and the operation restarted by pushing the capped tube 3 m into the concrete and then reinitiating the flow of concrete.

When slurry is used, a fully operational standby concrete pump, adequate to complete the work in the time specified, shall be provided at the site during concrete placement. The slurry level shall be maintained within 300 mm of the top of the drilled hole.

A log of concrete placement for each drilled hole shall be maintained by the Contractor when concrete is deposited under slurry. The log shall show the pile location, tip elevation, dates of excavation and concrete placement, total quantity of concrete deposited, length and tip elevation of any casing, and details of any hole stabilization method and materials used. The log shall include a 215 mm x 280 mm sized graph of the concrete placed versus depth of hole filled. The graph shall be plotted continuously throughout placing of concrete. The depth of drilled hole filled shall be plotted vertically with the pile tip oriented at the bottom and the quantity of concrete shall be plotted horizontally. Readings shall be made at least at each 1.5 m of pile depth, and the time of the reading shall be indicated. The graph shall be labeled with the pile location, tip elevation, cutoff elevation, and the dates of excavation and concrete placement. The log shall be delivered to the Engineer within one working day of completion of placing concrete in the pile.

After placing reinforcement and prior to placing concrete in the drilled hole, if drill cuttings settle out of the slurry, the bottom of the drilled hole shall be cleaned. The Contractor shall verify that the bottom of the drilled hole is clean.

If temporary casing is used, concrete placed under slurry shall be maintained at a level at least 1.5 m above the bottom of the casing. The withdrawal of casings shall not cause contamination of the concrete with slurry.

Material resulting from using slurry 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.

### **Acceptance Testing and Mitigation**

Vertical inspection pipes for acceptance testing shall be provided in all cast-in-drilled-hole concrete piles that are 600 mm in diameter or larger, except when the holes are dry or when the holes are dewatered without the use of temporary casing to control ground water.

Inspection pipes shall be Schedule 40 polyvinyl chloride pipes with a nominal inside diameter of 50 mm. Each inspection pipe shall be capped top and bottom and shall have watertight couplers to provide a clean, dry and unobstructed 50-mm diameter clear opening from 1.0 m above the pile cutoff down to the bottom of the reinforcing cage.

If the Contractor drills the hole below the specified tip elevation, the reinforcement and the inspection pipes shall be extended to 75 mm clear of the bottom of the drilled hole.

Inspection pipes shall be placed around the pile, inside the outermost spiral or hoop reinforcement, and 75 mm clear of the vertical reinforcement, at a uniform spacing not exceeding 840 mm measured along the circle passing through the centers of inspection pipes. A minimum of 2 inspection pipes per pile shall be used. When the vertical reinforcement is not bundled and each bar is not more than 26 mm in diameter, inspection pipes may be placed 50 mm clear of the vertical reinforcement. The inspection pipes shall be placed to provide the maximum diameter circle that passes through the centers of the inspection pipes while maintaining the clear spacing required herein. The pipes shall be installed in straight alignment, parallel to the main reinforcement, and securely fastened in place to prevent misalignment during installation of the reinforcement and placing of concrete in the hole.

The Contractor shall log the location of the inspection pipe couplers with respect to the plane of pile cut off, and these logs shall be delivered to the Engineer upon completion of the placement of concrete in the drilled hole.

After placing concrete and before requesting acceptance tests, each inspection pipe shall be tested by the Contractor in the presence of the Engineer by passing a 48.3-mm diameter rigid cylinder 610 mm long through the complete length of pipe. If the 48.3-mm diameter rigid cylinder fails to pass any of the inspection pipes, the Contractor shall attempt to pass a 32.0-mm diameter rigid cylinder 1.375 m long through the complete length of those pipes in the presence of the Engineer. If an inspection pipe fails to pass the 32.0-mm diameter cylinder, the Contractor shall immediately fill all inspection pipes in the pile with water.

The Contractor shall replace each inspection pipe that does not pass the 32.0-mm diameter cylinder with a 50.8-mm diameter hole cored through the concrete for the entire length of the pile. Cored holes shall be located as close as possible to the inspection pipes they are replacing and shall be no more than 150 mm inside the reinforcement. Coring shall not damage the pile reinforcement. Cored holes shall be made with a double wall core barrel system utilizing a split tube type inner barrel. Coring with a solid type inner barrel will not be allowed. Coring methods and equipment shall provide intact cores for the entire length of the pile concrete. The coring operation shall be logged by an Engineering Geologist or Civil Engineer licensed in the State of California and experienced in core logging. Coring logs shall include complete descriptions of inclusions and voids encountered during coring, and shall be delivered to the Engineer upon completion. Concrete cores shall be preserved, identified with the exact location the core was recovered from within the pile, and made available for inspection by the Engineer.

Acceptance tests of the concrete will be made by the Engineer, without cost to the Contractor. Acceptance tests will evaluate the homogeneity of the placed concrete. Tests will include gamma-gamma logging. Tests may also include crosshole sonic logging and other means of inspection selected by the Engineer. The Contractor shall not conduct operations within 8.0 m of the gamma-gamma logging operations. The Contractor shall separate reinforcing steel as necessary to allow the Engineer access to the inspection pipes to perform gamma-gamma logging or other acceptance testing. After requesting acceptance tests and providing access to the piling, the Contractor shall allow 3 weeks for the Engineer to conduct these tests and make determination of acceptance if the 48.3-mm diameter cylinder passed all inspection pipes, and 4 weeks if only the 32.0-mm diameter cylinder passed all inspection pipes. Should the Engineer fail to complete these tests within the time allowance, and if in the opinion of the Engineer, the Contractor's controlling operation is delayed or interfered with by reason of the delay in inspection, the delay will be considered a right of way delay as specified in Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

All inspection pipes and cored holes in a pile shall be dewatered and filled with grout after notification by the Engineer that the pile is acceptable. Placement and removal of water in the inspection pipes shall be at the Contractor's expense. Grout shall conform to the provisions in Section 50-1.09, "Bonding and Grouting," of the Standard Specifications. The inspection pipes and holes shall be filled using grout tubes that extend to the bottom of the pipe or hole or into the grout already placed.

If acceptance testing performed by the Engineer determines that a pile does not meet the requirements of the specifications, then that pile will be rejected and all depositing of concrete under slurry or concrete placed using temporary casing for the purpose of controlling groundwater shall be suspended until written changes to the methods of pile construction are approved in writing by the Engineer.

The Contractor shall submit to the Engineer for approval a mitigation plan for repair, supplementation, or replacement for each rejected cast-in-drilled-hole concrete pile, and this plan shall conform to the provisions in Section 5-1.02, "Plans and Working Drawings," of the Standard Specifications. Prior to submitting this mitigation plan, the Engineer will hold a repair feasibility meeting with the Contractor to discuss the feasibility of repairing rejected piling. The Engineer will consider the size of the defect, the location of the defect, and the design information and corrosion protection considerations for the pile. This information will be made available to the Contractor, if appropriate, for the development of the mitigation plan. If the Engineer determines that it is not feasible to repair the rejected pile, the Contractor shall not include repair as a means of mitigation and shall proceed with the submittal of a mitigation plan for replacement or supplementation of the rejected pile.

If the Engineer determines that a rejected pile does not require mitigation due to structural, geotechnical, or corrosion concerns, the Contractor may elect to 1) repair the pile per the approved mitigation plan, or 2) not repair anomalies found during acceptance testing of that pile. For such unrepaired piles, the Contractor shall pay to the State, \$400 per cubic meter for the portion of the pile affected by the anomalies. The volume, in cubic meters, of the portion of the pile affected by the anomalies, shall be calculated as the area of the cross-section of the pile affected by each anomaly, in square meters, as determined by the Engineer, multiplied by the distance, in meters, from the top of each anomaly to the specified tip of the pile. If the volume calculated for one anomaly overlaps the volume calculated for additional anomalies within the pile, the calculated volume for the overlap shall only be counted once. In no case shall the amount of the payment to the State for any such pile be less than \$400. The Department may deduct the amount from any moneys due, or that may become due the Contractor under the contract.

Pile mitigation plans shall include the following:

- A. The designation and location of the pile addressed by the mitigation plan.
- B. A review of the structural, geotechnical, and corrosion design requirements of the rejected pile.
- C. A step by step description of the mitigation work to be performed, including drawings if necessary.
- D. An assessment of how the proposed mitigation work will address the structural, geotechnical, and corrosion design requirements of the rejected pile.
- E. Methods for preservation or restoration of existing earthen materials.
- F. A list of affected facilities, if any, with methods and equipment for protection of these facilities during mitigation.
- G. The State assigned contract number, bridge number, full name of the structure as shown on the contract plans, District-County-Route-Kilometer Post, and the Contractor's (and Subcontractor's if applicable) name on each sheet.
- H. A list of materials, with quantity estimates, and personnel, with qualifications, to be used to perform the mitigation work.
- I. The seal and signature of an engineer who is licensed as a Civil Engineer by the State of California.

For rejected piles to be repaired, the Contractor shall submit a pile mitigation plan that contains the following additional information:

- A. An assessment of the nature and size of the anomalies in the rejected pile.
- B. Provisions for access for additional pile testing if required by the Engineer.

For rejected piles to be replaced or supplemented, the Contractor shall submit a pile mitigation plan that contains the following additional information:

- A. The proposed location and size of additional piling.
- B. Structural details and calculations for any modification to the structure to accommodate the replacement or supplemental piling.

All provisions for cast-in-drilled-hole concrete piling shall apply to replacement piling.

The Contractor shall allow the Engineer 3 weeks to review the mitigation plan after a complete submittal has been received.

Should the Engineer fail to review the complete pile mitigation submittal within the time specified, and if, in the opinion of the Engineer, the Contractor's controlling operation is delayed or interfered with by reason of the delay in reviewing the pile mitigation plan, an extension of time commensurate with the delay in completion of the work thus caused will be granted in conformance with the provisions in Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

When repairs are performed, the Contractor shall submit a mitigation report to the Engineer within 10 days of completion of the repair. This report shall state exactly what repair work was performed and quantify the success of the repairs relative to the submitted mitigation plan. The mitigation report shall be stamped and signed by an engineer that is licensed as a Civil Engineer by the State of California. The mitigation report shall show the State assigned contract number, bridge number, full name of the structure as shown on the contract plans, District-County-Route-Kilometer Post, and the Contractor (and Subcontractor if applicable) name on each sheet. The Engineer will be the sole judge as to whether a mitigation proposal is acceptable, the mitigation efforts are successful, and to whether additional repairs, removal and replacement, or construction of a supplemental foundation is required.

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

### 10-1.27 STEEL STRUCTURES

Construction of steel structures shall conform to the provisions in Section 55, "Steel Structures," of the Standard Specifications and these special provisions.

#### GENERAL

Attention is directed to "Welding" in Section 8, "Materials," of these special provisions.

The following substitutions of high-strength steel fasteners shall be made:

METRIC SIZE SHOWN ON THE PLANS	SIZE TO BE SUBSTITUTED
ASTM Designation: A 325M (Nominal bolt diameter (mm))	ASTM Designation: A 325 (Nominal bolt diameter (inch))
13, 12.70, or M12	1/2
16, 15.88, or M16	5/8
19, 19.05, or M20	3/4
22, 22.22, or M22	7/8
24, 25, 25.40, or M24	1
29, 28.58, or M27	1 1/8
32, 31.75, or M30	1 1/4
38, 38.10, or M36	1 1/2

#### MATERIALS

High-strength fastener assemblies and other bolts attached to structural steel with nuts and washers shall be zinc-coated. When direct tension indicators are used in these assemblies, the direct tension indicator and all components of the fastener assembly shall be zinc-coated by the mechanical deposition process.

#### ROTATIONAL CAPACITY TESTING PRIOR TO SHIPMENT TO JOB SITE

Rotational capacity tests shall be performed on all lots of high-strength fastener assemblies prior to shipment of these lots to the project site. Zinc-coated assemblies shall be tested after all fabrication, coating, and lubrication of components has been completed. One hardened washer shall be used under each nut for the tests.

The requirements of this section do not apply to high-strength cap screws or high-strength bolts used for slip base plates.

Each combination of bolt production lot, nut lot, and washer lot shall be tested as an assembly.

A rotational capacity lot number shall be assigned to each combination of lots tested. Each shipping unit of fastener assemblies shall be plainly marked with the rotational capacity lot number.

Two fastener assemblies from each rotational capacity lot shall be tested.

The following equipment, procedure, and acceptance criteria shall be used to perform rotational capacity tests on and determine acceptance of long bolts. Fasteners are considered to be long bolts when full nut thread engagement can be achieved when installed in a bolt tension measuring device:

A. Long Bolt Test Equipment:

1. Calibrated bolt tension measuring device with adequate tension capacity for the bolts being tested.
2. Calibrated dial or digital torque wrench. Other suitable tools will be required for performing Steps 7 and 8 of the Long Bolt Test Procedure. A torque multiplier may be required for large diameter bolts.
3. Spacer washers or bushings. When spacer washers or bushings are required, they shall have the same inside diameter and equal or larger outside diameter as the appropriate hardened washers conforming to the requirements in ASTM Designation: F436.
4. Steel beam or member, such as a girder flange or cross frame, to which the bolt tension measuring device will be attached. The device shall be accessible from the ground.

B Long Bolt Test Procedure:

1. Measure the bolt length. The bolt length is defined as the distance from the end of the threaded portion of the shank to the underside of the bolt head.
2. Install the nut on the bolt so that 3 to 5 full threads of the bolt are located between the bearing face of the nut and the underside of the bolt head. Measure and record the thread stick out of the bolt. Thread stick out is determined by measuring the distance from the outer face of the nut to the end of the threaded portion of the shank.
3. Insert the bolt into the bolt tension measuring device and install the required number of washers, and additional spacers as needed, directly beneath the nut to produce the thread stick out measured in Step 2 of this procedure.
4. Tighten the nut using a hand wrench to a snug-tight condition. The snug tension shall not be less than the Table A value but may exceed the Table A value by a maximum of 2 kips.

Table A

High-Strength Fastener Assembly Tension Values to Approximate Snug-Tight Condition	
Bolt Diameter (inches)	Snug Tension (kips)
1/2	1
5/8	2
3/4	3
7/8	4
1	5
1 1/8	6
1 1/4	7
1 3/8	9
1 1/2	10

5. Match-mark the assembly by placing a heavy reference start line on the face plate of the bolt tension measuring device which aligns with 1) a mark placed on one corner of the nut, and 2) a radial line placed across the flat on the end of the bolt, or on the exposed portions of the threads of tension control bolts. Place an additional mark on the outside of the socket that overlays the mark on the nut corner such that this mark will be visible while turning the nut. Make an additional mark on the face plate, either 2/3 of a turn, one turn, or 1 1/3 turn clockwise from the heavy reference start line, depending on the bolt length being tested as shown in Table B.

Table B

Required Nut Rotation for Rotational Capacity Tests <sup>(a,b)</sup>	
Bolt Length (measured in Step 1)	Required Rotation (turn)
4 bolt diameters or less	2/3
Greater than 4 bolt diameters but no more than 8 bolt diameters	1
Greater than 8 bolt diameters, but no more than 12 bolt diameters <sup>(c)</sup>	1 1/3
<p>(a) Nut rotation is relative to bolt, regardless of the element (nut or bolt) being turned. For bolts installed by 1/2 turn and less, the tolerance shall be plus or minus 30 degrees; for bolts installed by 2/3 turn and more, the tolerance shall be plus or minus 45 degrees.</p> <p>(b) Applicable only to connections in which all material within grip of the bolt is steel.</p> <p>(c) When bolt length exceeds 12 diameters, the required rotation shall be determined by actual tests in a suitable tension device simulating the actual conditions.</p>	

- Turn the nut to achieve the applicable minimum bolt tension value listed in Table C. After reaching this tension, record the moving torque, in foot-pounds, required to turn the nut, and also record the corresponding bolt tension value in pounds. Torque shall be measured with the nut in motion. Calculate the value, T (in ft-lbs), where  $T = [(the\ measured\ tension\ in\ pounds) \times (the\ bolt\ diameter\ in\ inches) / 48\ in/ft]$ .

Table C

Minimum Tension Values for High-Strength Fastener Assemblies	
Bolt Diameter (inches)	Minimum Tension (kips)
1/2	12
5/8	19
3/4	28
7/8	39
1	51
1 1/8	56
1 1/4	71
1 3/8	85
1 1/2	103

- Turn the nut further to increase bolt tension until the rotation listed in Table B is reached. The rotation is measured from the heavy reference line made on the face plate after the bolt was snug-tight. Record this bolt tension.
- Loosen and remove the nut and examine the threads on both the nut and bolt.

C. Long Bolt Acceptance Criteria:

1. An assembly shall pass the following requirements to be acceptable: 1) the measured moving torque (Step 6) shall be less than or equal to the calculated value, T (Step 6), 2) the bolt tension measured in Step 7 shall be greater than or equal to the applicable turn test tension value listed in Table D, 3) the nut shall be able to be removed from the bolt without signs of thread stripping or galling after the required rotation in Step 7 has been achieved, 4) the bolt does not shear from torsion or fail during the test, and 5) the assembly does not seize before the final rotation in Step 7 is reached. Elongation of the bolt in the threaded region between the bearing face of the nut and the underside of the bolt head is expected and will not be considered a failure. Both fastener assemblies tested from one rotational capacity lot shall pass for the rotational capacity lot to be acceptable.

Table D

Turn Test Tension Values	
Bolt Diameter (inches)	Turn Test Tension (kips)
1/2	14
5/8	22
3/4	32
7/8	45
1	59
1 1/8	64
1 1/4	82
1 3/8	98
1 1/2	118

The following equipment, procedure, and acceptance criteria shall be used to perform rotational capacity tests on and determine acceptance of short bolts. Fasteners are considered to be short bolts when full nut thread engagement cannot be achieved when installed in a bolt tension measuring device:

A. Short Bolt Test Equipment:

1. Calibrated dial or digital torque wrench. Other suitable tools will be required for performing Steps 7 and 8 of the Short Bolt Test Procedure. A torque multiplier may be required for large diameter bolts.
2. Spud wrench or equivalent.
3. Spacer washers or bushings. When spacer washers or bushings are required, they shall have the same inside diameter and equal or larger outside diameter as the appropriate hardened washers conforming to the requirements in ASTM Designation: F436.
4. Steel plate or girder with a hole to install bolt. The hole size shall be 1.6 mm greater than the nominal diameter of the bolt to be tested. The grip length, including any plates, washers, and additional spacers as needed, shall provide the proper number of threads within the grip, as required in Step 2 of the Short Bolt Test Procedure.

B. Short Bolt Test Procedure:

1. Measure the bolt length. The bolt length is defined as the distance from the end of the threaded portion of the shank to the underside of the bolt head.
2. Install the nut on the bolt so that 3 to 5 full threads of the bolt are located between the bearing face of the nut and the underside of the bolt head. Measure and record the thread stickout of the bolt. Thread stick out is determined by measuring the distance from the outer face of the nut to the end of the threaded portion of the shank.
3. Install the bolt into a hole on the plate or girder and install the required number of washers and additional spacers as needed between the bearing face of the nut and the underside of the bolt head to produce the thread stick out measured in Step 2 of this procedure.
4. Tighten the nut using a hand wrench to a snug-tight condition. The snug condition shall be the full manual effort applied to the end of a 305 mm long wrench. This applied torque shall not exceed 20 percent of the maximum allowable torque in Table E.

Table E

Maximum Allowable Torque for High-Strength Fastener Assemblies	
Bolt Diameter (inches)	Torque (ft-lbs)
1/2	145
5/8	285
3/4	500
7/8	820
1	1220
1 1/8	1500
1 1/4	2130
1 3/8	2800
1 1/2	3700

- Match-mark the assembly by placing a heavy reference start line on the steel plate or girder which aligns with 1) a mark placed on one corner of the nut and 2) a radial line placed across the flat on the end of the bolt or on the exposed portions of the threads of tension control bolts. Place an additional mark on the outside of the socket that overlays the mark on the nut corner such that this mark will be visible while turning the nut. Make 2 additional small marks on the steel plate or girder, one 1/3 of a turn and one 2/3 of a turn clockwise from the heavy reference start line on the steel plate or girder.
- Using the torque wrench, tighten the nut to the rotation value listed in Table F. The rotation is measured from the heavy reference line described in Step 5 made after the bolt was snug-tight. A second wrench shall be used to prevent rotation of the bolt head during tightening. Measure and record the moving torque after this rotation has been reached. The torque shall be measured with the nut in motion.

Table F

Nut Rotation Required for Turn-of-Nut Installation <sup>(a,b)</sup>	
Bolt Length (measured in Step 1)	Required Rotation (turn)
4 bolt diameters or less	1/3
(a) Nut rotation is relative to bolt, regardless of the element (nut or bolt) being turned. For bolts installed by 1/2 turn and less, the tolerance shall be plus or minus 30 degrees.	
(b) Applicable only to connections in which all material within grip of the bolt is steel.	

- Tighten the nut further to the 2/3-turn mark as indicated in Table G. The rotation is measured from the heavy reference start line made on the plate or girder when the bolt was snug-tight. Verify that the radial line on the bolt end or on the exposed portions of the threads of tension control bolts is still in alignment with the start line.

Table G

Required Nut Rotation for Rotational Capacity Test	
Bolt Length (measured in Step 1)	Required Rotation (turn)
4 bolt diameters or less	2/3

- Loosen and remove the nut and examine the threads on both the nut and bolt.

### C. Short Bolt Acceptance Criteria:

1. An assembly shall pass the following requirements to be acceptable: 1) the measured moving torque from Step 6 shall be less than or equal to the maximum allowable torque from Table E, 2) the nut shall be able to be removed from the bolt without signs of thread stripping or galling after the required rotation in Step 7 has been achieved, 3) the bolt does not shear from torsion or fail during the test, and 4) the assembly shall not seize before the final rotation in Step 7 is reached. Elongation of the bolt in the threaded region between the bearing face of the nut and the underside of the bolt head will not be considered a failure. Both fastener assemblies tested from one rotational capacity lot shall pass for the rotational capacity lot to be acceptable.

### **INSTALLATION TENSION TESTING AND ROTATIONAL CAPACITY TESTING AFTER ARRIVAL ON THE JOB SITE**

Installation tension tests and rotational capacity tests on high-strength fastener assemblies shall be performed by the Contractor prior to acceptance or installation and after arrival of the fastener assemblies on the project site. Installation tension tests and rotational capacity tests shall be performed at the job-site, in the presence of the Engineer, on each rotational capacity lot of fastener assemblies.

The requirements of this section do not apply to high-strength cap screws or high-strength bolts used for slip base plates.

Installation tension tests shall be performed on 3 representative fastener assemblies in conformance with the provisions in Section 8, "Installation," of the RCSC Specification. For short bolts, Section 8.2, "Pretensioned Joints," of the RCSC Specification shall be replaced by the "Pre-Installation Testing Procedures," of the "Structural Bolting Handbook," published by the Steel Structures Technology Center, Incorporated.

The rotational capacity tests shall be performed in conformance with the requirements for rotational capacity tests in "Rotational Capacity Testing Prior to Shipment to Job Site" of these special provisions.

At the Contractor's expense, additional installation tension tests, tests required to determine job inspecting torque, and rotational capacity tests shall be performed by the Contractor on each rotational capacity lot, in the presence of the Engineer, if 1) any fastener is not used within 3 months after arrival on the jobsite, 2) fasteners are improperly handled, stored, or subjected to inclement weather prior to final tightening, 3) significant changes are noted in original surface condition of threads, washers, or nut lubricant, or 4) the Contractor's required inspection is not performed within 48 hours after all fasteners in a joint have been tensioned.

Failure of a job-site installation tension test or a rotational capacity test will be cause for rejection of unused fasteners that are part of the rotational capacity lot.

When direct tension indicators are used, installation verification tests shall be performed in conformance with Appendix Section X1.4 of ASTM Designation: F959, except that bolts shall be initially tensioned to a value 5 percent greater than the minimum required bolt tension.

### **SURFACE PREPARATION**

For all bolted connections, the new contact surfaces and inside surfaces of bolt holes shall be cleaned and coated before assembly in conformance with the provisions for cleaning and painting structural steel of these special provisions.

### **SEALING**

The perimeter around all direct tension indicator gaps shall be completely sealed with non-silicone type sealing compound conforming to the provisions in Federal Specification TT-S-230, Type II. The sealant shall be gray in color and have a minimum thickness of 1.3 mm. If painting is required, the sealing compound shall be applied prior to painting.

### **WELDING**

Dimensional details and workmanship for welded joints in tubular and pipe connections shall conform to the provisions in Part A, "Common Requirements of Nontubular and Tubular Connections," and Part D, "Specific Requirements for Tubular Connections," in Section 2 of AWS D1.1.

The requirement of conformance with AWS D1.5 shall not apply to work conforming to Section 86-2.04, "Standards, Steel Pedestals and Posts," of the Standard Specifications.

### **PAYMENT**

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

### **10-1.28 CONCRETE STRUCTURES**

Portland cement concrete structures shall conform to the provisions in Section 51, "Concrete Structures," of the Standard Specifications and these special provisions.

### **10-1.29 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-shs\\_millennium.htm](http://mutcd.fhwa.dot.gov/ser-shs_millennium.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 8 m. 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: B209.

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 sheet aluminum.

Sheet aluminum shall be pretreated in accordance to ASTM Designation: B449. 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 mass between 108 mg/m<sup>2</sup> and 377 mg/m<sup>2</sup>, and an average mass of 269 mg/m<sup>2</sup>. 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 accordance with ASTM Designation: D4956 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: D4956 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: D4956.

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 1220 mm, one horizontal splice will be allowed in the sheet aluminum.

Framing for single sheet aluminum sign shall consist of aluminum channel or rectangular aluminum tubing. The framing shall have a length tolerance of +3 mm. The face sheet shall be affixed to the frame with rivets of 5-mm diameter. Rivets shall be placed within the web of channels and shall not be placed less than 13 mm 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 +3 mm per meter when measured across the plane of the sign in all directions. The finished signs shall have an overall tolerance within +3 mm 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.

### **MEASUREMENT AND PAYMENT**

Furnishing signs (except for construction area signs) will be measured by the square meter and the quantity to be paid for will be the total area, in square meters, of the sign panel types installed in place.

The contract price paid per square meter for furnish sign of the types specified 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 fabricating and furnishing the signs, including fastening hardware, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Full compensation for furnishing and installing protective overlay on signs shall be considered as included in the contract price paid per square meter for furnish sign of the various types and no separate payment will be made therefor.

#### **10-1.30 PAINT CONCRETE CURB**

The top and face of concrete curbs shall be prepared and painted in conformance with the details shown on the plans, the provisions in Section 59, "Painting," and Section 91, "Paint," of the Standard Specifications, and these special provisions.

The paint to be applied to concrete surfaces shall conform to the provisions in Section 91-4.05, "Paint; Acrylic Emulsion, Exterior White and Light and Medium Tints," of the Standard Specifications. The color of the paint shall be red.

Painting the top and face of concrete curb shall be paid for as paint curb (2-coat), and shall be measured by the meter along the curb face.

The contract price paid per meter for paint curb (2-coat) shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in preparing the top and face of concrete curb and applying paint, as shown on the plans, as specified in these special provisions, and as directed by the Engineer.

#### **10-1.31 ALTERNATIVE PIPE**

Alternative pipe culverts shall conform to the provisions in Section 62, "Alternative Culverts," of the Standard Specifications and these special provisions.

#### **10-1.32 PLASTIC PIPE**

Plastic pipe shall conform to the provisions in Section 64, "Plastic Pipe," of the Standard Specifications and these special provisions.

Plastic pipe culverts shall have smooth interior walls.

**10-1.33 REINFORCED CONCRETE PIPE**

Reinforced concrete pipe shall conform to the provisions in Section 65, "Reinforced Concrete Pipe," of the Standard Specifications and these special provisions.

Where embankment will not be placed over the top of the pipe, a relative compaction of not less than 85 percent shall be required below the pipe spring line for pipe installed using Method 1 backfill in trench, as shown on Standard Plan A62D. Where the pipe is to be placed under the traveled way, a relative compaction of not less than 90 percent shall be required unless the minimum distance between the top of the pipe and the pavement surface is the greater of 1.2 m or one half of the outside diameter of the pipe.

Except as otherwise designated by classification on the plans or in the specifications, joints for culvert and drainage pipes shall conform to the plans or specifications for standard joints.

When reinforced concrete pipe is installed in conformance with the details shown on Standard Plan A62DA, the fifth paragraph of Section 19-3.04, "Water Control and Foundation Treatment," of the Standard Specifications shall not apply.

When solid rock or other unyielding material is encountered at the planned elevation of the bottom of the bedding, the material below the bottom of the bedding shall be removed to a depth of 1/50 of the height of the embankment over the top of the culvert, but not less than 150 mm nor more than 300 mm. The resulting trench below the bottom of the bedding shall be backfilled with structure backfill material in conformance with the provisions in Section 19-3.06, "Structure Backfill," of the Standard Specifications.

The Outer Bedding shown on Standard Plan A62DA shall not be compacted prior to placement of the pipe.

**10-1.34 CORRUGATED METAL PIPE**

Corrugated steel pipe culverts shall conform to the provisions in Section 66, "Corrugated Metal Pipe," of the Standard Specifications and these special provisions.

Attention is directed to "Earthwork" and "Controlled Low Strength Material" of these special provisions regarding structure backfill for pipe culverts.

Corrugated steel pipe shall be fabricated from zinc-coated steel sheet.

**10-1.35 DRAINAGE INLET MARKER**

The Contractor shall furnish and install stainless steel or stamped drainage inlet markers in conformance with the details and locations shown on the plans, as specified in these special provisions, and as directed by the Engineer.

The Contractor shall furnish a Certificate of Compliance to the Engineer in conformance with the provisions in Section 6-1.07, "Certificates of Compliance," of the Standard Specifications for stainless steel drainage inlet markers. In addition, samples of drainage inlet marker shall be submitted to the Engineer 10 days before placement of the markers.

Stainless steel drainage inlet markers shall be prefabricated from commercial grade stainless steel and shall conform to the requirements as follow. Stainless steel drainage inlet markers shall be cemented to the surface of drainage inlet with adhesives as recommended by the manufacturer of the marker.

Property	Specifications	Requirements
Diameter, mm	Measured	102
Thickness of metal, mm	Measured	1.372 – 1.676
Height of marker, mm	Measured	2.870 - 3.480
Legend color (non-reflective)	Visual	Light blue, dark blue, with white background, baked enamel
Background color (non-reflective)		White
Skid Resistance	ASTM Designation: E-303	60 BPN

The Contractor shall mechanically clean the surface before placing stainless steel drainage inlet markers.

The surface of drainage inlets shall be imprinted as shown on the plans with an approved stamp. The stamp shall be furnished by the Contractor. Stamped surfaces shall be free from blemishes.

Drainage inlet marker will be measured as units determined from actual count in place.

The contract unit price paid for drainage inlet marker shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in furnishing and installing drainage inlet markers, 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 furnishing the approved stamp and for stamping drainage inlets shall be considered as included in the contract price paid per cubic meter for minor concrete (minor structure) and no separate payment will be made therefor.

### **10-1.36 MISCELLANEOUS FACILITIES**

Precast concrete pipe inlet shall conform to the provisions in Section 70, "Miscellaneous Facilities," of the Standard Specifications.

### **10-1.37 MISCELLANEOUS CONCRETE CONSTRUCTION**

Concrete curb, gutters, sidewalks, curb ramps, retaining curbs, and spandrels shall conform to the provisions in Section 73, "Concrete Curbs and Sidewalks," of the Standard Specifications and these special provisions.

Curb ramp detectable warning surface shall consist of raised truncated domes constructed or installed on curb ramps in conformance with the details shown on the plans and these special provisions. At the option of the Contractor, the detectable warning surface shall be prefabricated, cast-in-place, or stamped into the surface of the curb ramp. The color of the detectable warning surface shall be yellow conforming to Federal Standard 595B, Color No. 33538.

Prefabricated detectable warning surface shall be in conformance with the requirements established by the Department of General Services, Division of State Architect and be attached in conformance with the manufacturer's recommendations.

Cast-in-place and stamped detectable warning surfaces shall be painted in conformance with the provisions in Section 59-6, "Painting Concrete," of the Standard Specifications.

The finished surfaces of the detectable warning surface shall be free from blemishes.

Prior to constructing the cast-in-place or stamping the detectable warning surface, the Contractor shall demonstrate the ability to produce a detectable warning surface conforming to the details shown on the plans and these special provisions by constructing a 600-mm by 600-mm test panel.

The manufacturer shall provide a written 5-year warranty for prefabricated detectable warning surfaces, guaranteeing replacement when there is defect in the dome shape, color fastness, sound-on-cane acoustic quality, resilience, or attachment. The warranty period shall begin upon acceptance of the contract.

Full compensation for constructing or furnishing and installing curb ramp detectable warning surfaces shall be considered as included in the contract price paid per cubic meter for minor concrete (miscellaneous construction) and no separate payment will be made therefor.

### **10-1.38 MISCELLANEOUS IRON AND STEEL**

Miscellaneous iron and steel shall conform to the provisions in Section 75, "Miscellaneous Metal," of the Standard Specifications and these special provisions.

## **SECTION 10-2 HIGHWAY PLANTING**

### **10-2.01 GENERAL**

The work performed in connection with highway planting shall conform to the provisions in Section 20, "Erosion Control and Highway Planting," of the Standard Specifications and these special provisions.

#### **PROGRESS INSPECTIONS**

Progress inspections will be performed by the Engineer for completed highway planting work at designated stages during the life of the contract.

Progress inspections will not relieve the Contractor of responsibility for installation in conformance with the special provisions, plans and Standard Specifications. Work within an area shall not progress beyond each stage until the inspection has been completed, corrective work has been performed, and the work is approved, unless otherwise permitted by the Engineer.

The requirements for progress inspections will not preclude additional inspections of work by the Engineer at other times during the life of the contract.

The Contractor shall notify the Engineer, in writing, at least 4 working days prior to completion of the work for each stage of an area and shall allow a minimum of 3 working days for the inspection.

Progress inspections will be performed at the following stages of work:

- A. Before planting begins and after completion of the work specified for planting in Section 20-4.03, "Preparing Planting Areas," of the Standard Specifications.
- B. Before plant establishment work begins and after completion of the work specified for planting in Section 20-4.05, "Planting," of the Standard Specifications.
- C. At intervals of one month during the plant establishment period.

## **COST BREAK-DOWN**

The Contractor shall furnish the Engineer a cost break-down for the contract lump sum item of highway planting. The cost break-down table shall be submitted to the Engineer for approval within 15 working days after the contract has been approved. The cost break-down table will be approved, in writing, by the Engineer before any partial payment will be made for the item of highway planting.

The cost break-down shall be completed and furnished in the format shown in the sample of the cost break-down included in this section. Line item descriptions of work shown in the samples are the minimum to be submitted. Additional line item descriptions of work may be designated by the Contractor. If the Contractor elects to designate additional line item descriptions of work, the quantity, value and amount for those line items shall be completed in the same manner as for the line item descriptions shown in the samples. The line items and quantities given in the sample are to show the manner of preparing the cost break-down to be furnished by the Contractor.

The Contractor shall determine the quantities required to complete the work shown on the plans. The quantities and their values shall be included in the cost break-down submitted to the Engineer for approval. The Contractor shall be responsible for the accuracy of the quantities and values used in the cost break-down submitted for approval.

The sum of the amounts for the line items of work listed in the cost break-down table for highway planting work shall be equal to the contract lump sum price bid for the work. Overhead and profit shall be included in each individual line item of work listed in the cost break-down table.

No adjustment in compensation will be made in the contract lump sum price paid for highway planting due to differences between the quantities shown in the cost break-down table furnished by the Contractor and the quantities required to complete the work as shown on the plans and as specified in these special provisions.

Individual line item values in the approved cost break-down table will be used to determine partial payments during the progress of the work and as the basis for calculating an adjustment in compensation for the contract lump sum item of highway planting due to changes in line items of work ordered by the Engineer. When the total value of ordered changes to line items of work increases or decreases the lump sum price bid for highway planting by more than 25 percent, the adjustment in compensation will be determined in the same manner specified for increases and decreases in the total pay quantity of an item of work in Section 4-1.03B, "Increased or Decreased Quantities," of the Standard Specifications.

**HIGHWAY PLANTING COST BREAK-DOWN**

**Contract No. 05-487724**

UNIT DESCRIPTION	UNIT	APPROXIMATE QUANTITY	VALUE	AMOUNT
ROADSIDE CLEARING	LS	LS		
MULCH	M3	0.2		
PLANT (GROUP K)	EA	3		
COMMERCIAL FERTILIZER (PACKET)	EA	60		
WATERING WELL	EA	12		

**TOTAL** \_\_\_\_\_

**10-2.02 EXISTING HIGHWAY PLANTING**

In addition to the provisions in Section 20, "Erosion Control and Highway Planting," of the Standard Specifications, work performed in connection with existing highway planting shall conform to the provisions in "Existing Highway Facilities," of these special provisions.

Replacement planting shall conform to the provisions in "Preservation of Property" of these special provisions.

**MAINTAIN EXISTING PLANTED AREAS**

Existing planted areas shall be maintained as directed by the Engineer. Maintaining existing planted areas will be paid for as extra work as provided in Section 4-1.03D, "Extra Work," of the Standard Specifications.

Attention is directed to "Preservation of Property" of these special provisions.

**PRUNE EXISTING PLANTS**

Existing plants, as determined by the Engineer, shall be pruned. Pruning of the existing plants, except as otherwise provided in these special provisions, will be paid for as extra work as provided in Section 4-1.03D of the Standard Specifications.

**10-2.03 (BLANK)**

**10-2.04 HIGHWAY PLANTING**

The work performed in connection with highway planting shall conform to the provisions in Section 20-4, "Highway Planting," of the Standard Specifications and these special provisions.

**HIGHWAY PLANTING MATERIALS**

**Mulch**

Mulch shall consist of either wood chips or tree bark or a combination of both.

**Commercial Fertilizer (Packets)**

Commercial fertilizer (packet) shall be slow or controlled release and shall be in a biodegradable packet form. The packet shall gradually release nutrients over a 12-month period. Each packet shall have a mass of 10 g ± 1 g and shall have the following guaranteed chemical analysis:

Ingredient	Percentage
Nitrogen	20
Phosphoric Acid	10
Water Soluble Potash	5

**ROADSIDE CLEARING**

Prior to preparing planting areas, trash and debris shall be removed from these areas and a distance of 3 m beyond the edges of those areas. At locations where proposed planting areas are 3.6 m or more from the edges of dikes, curbs, sidewalks, fences, walls, paved shoulders and existing planting to remain or to be maintained, the clearing limit shall be 2 m beyond the outer limits of the proposed planting area.

In addition to removing trash and debris, the project area shall be cleared as specified herein:

- A. Weeds shall be killed and removed within an area 2 m in diameter centered at each plant location where the plants are to be planted more than 4.6 m apart and are located outside of ground cover areas.

After the initial roadside clearing is complete, additional roadside clearing work shall be performed as necessary to maintain the areas, as specified above, in a neat appearance until the start of the plant establishment period. This work shall include the following:

- A. Trash and debris shall be removed.
- B. Rodents shall be controlled.
- C. Weed growth shall be killed before the weeds reach the seed stage of growth or exceed 150 mm in length.
- D. Weeds in plant basins, including basin walls, shall be removed by hand pulling, after the plants have been planted.

## **Weed Control**

Weed control shall also conform to the following:

- A. Stolon type weeds shall be killed with glyphosate.
- B. Removed weeds 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.

Roadside clearing work shall not include work required to be performed as clearing and grubbing as specified in Section 16, "Clearing and Grubbing," of the Standard Specifications.

## **PESTICIDES**

Pesticides used to control weeds shall conform to the provisions in Section 20-4.026, "Pesticides," of the Standard Specifications. Except as otherwise provided in these special provisions, pesticide use shall be limited to the following materials:

Cacodylic Acid  
Diquat  
Fluazifop-butyl  
Glyphosate  
Isoxaben (Preemergent)  
Sethoxydim  
Oxadiazon - 50 percent WP (Preemergent)  
Oryzalin (Preemergent)  
Pendimethalin (Preemergent)  
Prodiamine (Preemergent)  
Trifluralin (Preemergent)  
Melfluidide (Growth regulator)  
Napropamide (Preemergent)

Glyphosate shall be used to kill stolon type weeds.

Oxadiazon shall be of the emulsifiable concentration or wettable powder type, except when Oxadiazon is used under mulch in conformance with these special provisions.

A minimum of 100 days shall elapse between applications of preemergents.

Except for ground cover plants, preemergents shall not be applied within 450 mm of plants.

Growth regulators shall not be applied within 2 m of trees, shrubs or vines.

If the Contractor elects to request the use of other pesticides on this project, the request shall be submitted, in writing, to the Engineer not less than 15 days prior to the intended use of the other pesticides. Except for the pesticides listed in these special provisions, no pesticides shall be used or applied without prior written approval of the Engineer.

Pesticides shall not be applied within the limits of the plant basins. Pesticides shall not be applied in a manner that allows the pesticides to come in contact with the foliage and woody parts of the plants.

## **PLANTING**

Commercial fertilizer packets shall be placed in the backfill of each plant at the time of planting and at the rate shown on the Plant List to within 150 to 200 mm of the soil surface and approximately 25 mm from the roots. When more than one fertilizer packet is required per plant, the packets shall be distributed evenly around the root ball.

## **WATERING WELL**

Watering well work shall consist of furnishing and installing perforated plastic drain pipe, drain grate cap and gravel, as shown on the plans, in conformance with these special provisions, and as directed by the Engineer.

Drain pipe shall be commercially available rigid, perforated, polyvinyl chloride (PVC) pipe with holes spaced not more than 150 mm on center on all sides of the pipe.

The drain grate shall be a commercially available, one-piece, injection molded drain grate manufactured from structural foam polyolefins, with ultraviolet light inhibitors. The color of the drain grate shall be green.

Gravel or crushed rock for filling the drain pipe shall have a nominal diameter of 13-20 mm. Gravel shall be clean, washed, dry and free from clay or organic material.

## **PLANT ESTABLISHMENT WORK**

The plant establishment period shall be Type 2 and shall not be less than 120 working days.

Attention is directed to "Relief From Maintenance and Responsibility" in these special provisions regarding relief from maintenance and protection.

Weeds within plant basins, including basin walls, shall be controlled by hand pulling.

The final inspection shall be performed in conformance with the provisions in Section 5-1.13, "Final Inspection," of the Standard Specifications and shall be completed a minimum of 20 working days before the estimated completion of the contract.

### **10-2.05 (BLANK)**

## **SECTION 10-3. SIGNALS, LIGHTING AND ELECTRICAL SYSTEMS**

### **10-3.01 DESCRIPTION**

Modifying traffic signals, lighting and emergency vehicle detector system shall conform to the provisions in Section 86, "Signals, Lighting and Electrical Systems," of the Standard Specifications and these special provisions.

Traffic signal work shall be performed at the following locations:

- A. Route 225/Route 101 SB Ramps
- B. Route 225/Modoc Road
- C. Route 225/Portesuello Avenue
- D. Route 225/FloralVista and Mesa Lane
- E. Route 225/Meigs Road

### **10-3.02 COST BREAK-DOWN**

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

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

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

### **10-3.03 MAINTAINING EXISTING AND TEMPORARY ELECTRICAL SYSTEMS**

Traffic signal system shutdowns shall be limited to periods allowed for lane closures listed or specified in "Maintaining Traffic" of these special provisions.

### **10-3.04 FOUNDATIONS**

Reinforced cast-in-drilled-hole concrete pile foundations for traffic signal and lighting standards shall conform to the provisions in "Piling" of these special provisions except payment.

### **10-3.05 STANDARDS, STEEL PEDESTALS, AND POSTS**

Standards, steel pedestals, and posts for traffic signal and lighting standards shall conform to the provisions in Section 86-2.04, "Standards, Steel Pedestals and Posts," of the Standard Specifications, "Steel Structures" of these special provisions, and the following requirements.

Steel bolts not designated on the plans as high-strength (HS) or stainless steel shall be for general applications and shall conform to the requirements in ASTM Designation: A 307.

Handhole reinforcement rings for standards, steel pedestals, and posts shall be continuous around the handholes.

Type 1 standards shall be assembled and set with the handhole on the downstream side of the pole in relation to traffic or as shown on the plans.

All ferrous metal parts of tubular sign structures shall be galvanized and shall not be painted.

### **10-3.06 CONDUIT**

Conduit to be installed underground shall be Type 3 unless otherwise specified. Detector termination conduits shall be Type 3.

The conduit in a foundation and between a foundation and the nearest pull box shall be Type 3.

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

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

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

Conduit runs shown on the plans to be located behind curbs may be installed in the street, within 0.9-m of, and parallel with the face of the curb, by the "Trenching in Pavement Method" in conformance with the provisions in Section 86-2.05C, "Installation," of the Standard Specifications. Pull boxes shall be located behind the curb or at the locations shown on the plans.

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

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

**10-3.07 CONDUCTORS AND WIRING**

Splices shall be insulated by heat-shrink tubing of the appropriate size after thoroughly painting the spliced conductors with electrical insulating coating.

All conductor insulation shall be Type THW.

**SIGNAL INTERCONNECT CABLE.**

Signal Interconnect Cable (SIC) shall be the 6-pair type.

**10-3.08 BONDING AND GROUNDING**

Bonding and grounding shall conform to the provisions in Section 86-2.10, "Bonding and Grounding," of the Standard Specifications and these special provisions.

Bonding jumpers in standards with handholes and traffic pull box lid covers shall be attached by a UL listed lug using 4.5-mm diameter or larger brass or bronze bolts and shall run to the conduit or bonding wire in the adjacent pull box. The grounding jumper shall be visible after the standard has been installed and the mortar pad and cap have been placed on the foundation.

Standards without handholes shall have bonding accomplished by jumpers attached to UL listed ground clamps on each anchor bolt.

For slip base standards or slip base inserts, bonding shall be accomplished by jumpers attached to UL listed ground clamps on each anchor bolt, or a UL listed lug attached to the bottom slip base plate with a 4.5-mm diameter or larger brass or bronze bolt.

Equipment bonding and grounding conductors are required in conduits, except when the conduits contain combinations of loop lead-in cable, fiber optic cable, or signal interconnect cable. A No. 8 minimum, bare copper wire shall run continuously in circuits, except for series lighting circuits, where No. 6 bare copper wire shall run continuously. The bonding wire size shall be increased to match the circuit breaker size in conformance with the Code, or shall be as shown on the plans. Conduits to be installed for future conductors, may omit the copper wire.

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.

### **10-3.09 SERVICE**

Type III service equipment enclosures shall be the aluminum type.

Circuit breakers shall be the cable-in/cable-out type, mounted on non-energized clips. All circuit breakers shall be mounted vertically with the up position of the handle being the "ON" position.

### **10-3.10 NUMBERING ELECTRICAL EQUIPMENT**

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

### **10-3.11 STATE-FURNISHED CONTROLLER ASSEMBLY**

The Model 2070 controller assembly, including controller unit, completely wired controller cabinet and inductive loop detector sensor units, but without anchor bolts, will be State-furnished as provided under "Materials" of these special provisions.

The Contractor shall construct the controller cabinet foundation as shown on the plans for Model 332 cabinets (including furnishing and installing anchor bolts), shall install the controller cabinet on the foundation, and shall make field wiring connections to the terminal blocks in the controller cabinet.

A listing of field conductor terminations, in each State-furnished controller cabinet, will be furnished free of charge to the Contractor at the site of the work.

State forces will maintain controller assemblies. The Contractor's responsibility for controller assemblies shall be limited to conforming to the provisions in Section 6-1.02, "State-Furnished Materials," of the Standard Specifications.

### **10-3.12 VEHICLE SIGNAL FACES AND SIGNAL HEADS**

Light emitting diode signal modules for vehicular traffic signal units will be State-furnished in conformance with the provisions in "Materials" of these special provisions.

### **10-3.13 BATTERY BACKUP SYSTEM**

#### **DESCRIPTION**

The battery back up system (BBS) shall consist of an external cabinet, an inverter/charger, a power transfer relay, a manual bypass switch, a temperature probe, hardware, a battery harness, and interconnect wiring. The BBS will be State-furnished as provided under "Materials" of these special provisions. The Contractor shall furnish the batteries.

The Contractor shall attach the external cabinet, install the temperature probe, assemble and install the BBS in the external cabinet, install the batteries, connect the battery wiring harness, and make wiring connections.

#### **MATERIAL**

The Contractor shall furnish batteries compatible with the State-furnished BBS and suitable for outdoor applications.

Batteries shall:

- A. have voltage rating 12 V,
- B. be group size 24,
- C. be 75 to 80 ampere-hour at 20 hour rate,
- D. be commercially available and stocked locally,
- E. have a carrying handle,
- F. be marked with date code and maximum recharge data and recharge cycles,
- G. have 2 top mounted terminal posts with recessed thread lugs for 6.35 mm diameter, 20 thread count per 25.4 mm bolts,
- H. be fully charged when furnished, and
- I. be free from damage or deformities.

The Contractor shall provide 4 batteries per BBS installation.

The batteries shall be deep cycle, sealed prismatic lead-calcium based absorbed glass mat/valve regulated lead acid (AGM/VRLA).

The batteries shall be certified by the manufacturer to operate over a temperature range of -25°C to 74°C.

The Contractor shall submit the battery data sheet to the Engineer when the batteries are delivered to the jobsite. The data sheet shall include the following features:

- A. model number,
- B. serial number,
- C. dimensions,
- D. charts,
- E. table of discharge rating,
- F. product information,
- G. battery specifications, and
- H. conductivity reading per battery (in Siemens).

The batteries shall have a written warranty against defects in materials and workmanship from the manufacturer prorated for a period of 60 months after installation. The Contractor shall provide the Engineer with all warranty documentation prior to installation. Replacement batteries shall be provided within 5 days after receipt of failed batteries at no cost to the State except the cost of shipping the failed batteries. Replacement batteries shall be delivered to Caltrans Maintenance Electrical Shop at 50 Higuera Street, San Luis Obispo Ca 93401.

### **MOUNTING AND CONFIGURATION**

Details for attaching the external cabinet to the controller cabinet and for wiring the State-furnished BBS will be provided in an information handout described in "Project Information" of these special provisions.

The Contractor shall mount the external cabinet to the controller cabinet on the side opposite the police panel, as shown in the information handout.

The Contractor shall apply a pliable seal composed of caulking compound or mastic around the gap between the external cabinet and the controller cabinet.

The Contractor shall mount the BBS inverter/charger, power transfer relay, and the manual bypass switch inside the external cabinet. The inverter/charger, the power transfer relay and the manual bypass switch shall be mounted on the external cabinet shelf.

The Contractor shall assemble the State-furnished BBS equipment in accordance with the manufacturer's recommendations.

#### **Functional Testing**

The BBS functional test shall include at least 30 minutes of continuous, satisfactory operation with utility power turned off. Testing will be performed in the presence of the Engineer.

### **10-3.14 PEDESTRIAN SIGNALS**

Light emitting diode signal modules for Type A pedestrian signals will be State-furnished in conformance with the provisions in "Materials" of these special provisions.

### **10-3.15 DETECTORS**

Loop detector sensor units will be State-furnished in conformance with the provisions in "Materials" of these special provisions.

Loop wire shall be Type 2.

Loop detector lead-in cable shall be Type B.

Slots shall be filled with hot-melt rubberized asphalt sealant.

At the Contractor's option, where a Type A loop is designated on the plans, a Type E loop may be substituted.

For Type E detector loops, sides of the slot shall be vertical and the minimum radius of the slot entering and leaving the circular part of the loop shall be 40 mm. Slot width shall be a maximum of 20 mm.

### **10-3.16 EMERGENCY VEHICLE DETECTOR SYSTEM**

Each traffic signal shall have an emergency vehicle detector system which shall conform to the details shown on the plans and these special provisions.

#### **GENERAL**

Each emergency vehicle detector system shall consist of an optical emitter assembly or assemblies located on the appropriate vehicle and an optical detector/discriminator assembly or assemblies located at the traffic signal.

Emitter assemblies are not required for this project except units for testing purposes to demonstrate that the systems perform as specified. Tests shall be conducted in the presence of the Engineer as described below under "System Operation" during the signal test period. The Engineer shall be given a minimum of 2 working days notice prior to performing the tests.

Each system shall permit detection of 2 classes of authorized vehicles. Class I (mass transit) vehicles shall be detected at ranges of up to 300 m from the optical detector. Class II (emergency) vehicles shall be detected at ranges up to 550 m from the optical detector.

Class I signals (those emitted by Class I vehicles) shall be distinguished from Class II signals (those emitted by Class II vehicles) on the basis of the modulation frequency of the light from the respective emitter. The modulation frequency for Class I signal emitters shall be  $9.639 \text{ Hz} \pm 0.110 \text{ Hz}$ . The modulation frequency for Class II signal emitters shall be  $14.035 \text{ Hz} \pm 0.250 \text{ Hz}$ .

A system shall establish a priority of Class II vehicle signals over Class I vehicle signals and shall conform to the requirements in Section 25352 of the California Vehicle Code.

## **EMITTER ASSEMBLY**

Each emitter assembly, provided for testing purposes, shall consist of an emitter unit, an emitter control unit, and connecting cables.

### **General**

Each emitter assembly, including lamp, shall operate over an ambient temperature range of  $-34^{\circ}\text{C}$  to  $60^{\circ}\text{C}$  at both modulation frequencies and operate continuously at the higher frequency for a minimum of 3000 hours at  $25^{\circ}\text{C}$  ambient before failure of the lamp or other components.

Each emitter unit shall be controlled by a single, maintained-contact switch on the respective emitter control unit. The switch shall be located to be readily accessible to the vehicle driver. The control unit shall contain a pilot light to indicate that the emitter power circuit is energized and shall generate only one modulating code, either that for Class I vehicles or that for Class II vehicles.

### **Functional**

Each emitter unit shall transmit optical energy in one direction only.

The signal from each Class I signal emitter unit shall be detectable at a distance of 300 m when used with a standard optical detection/discriminator assembly and filter to eliminate visible light. Visible light shall be considered eliminated when the output of the emitter unit with the filter is less than an average of 0.0003-candela per energy pulse in the wavelength range of 380 nm to 750 nm when measured at a distance of 3 m. A Certificate of Compliance, conforming to the requirements in Section 6-1.07, "Certificates of Compliance," of the Standard Specifications shall be submitted to the Engineer with each Class I emitter unit.

The signal from each Class II signal emitter unit shall be detectable at a distance of 550 m when used with a standard optical detection/discriminator assembly.

The standard optical detection/discriminator assembly to be used in making the range tests shall be available from the manufacturer of the system. A certified performance report shall be furnished with each assembly.

### **Electrical**

Each emitter assembly shall provide full light output with input voltages of between 12.5 V(dc) and 17.5 V(dc). An emitter assembly shall not be damaged by input voltages up to 7.5 V(dc) above supply voltage. The emitter assembly shall not generate voltage transients, on the input supply, which exceed the supply voltage by more than 4 volts.

Each emitter assembly shall consume not more than 100 W at 17.5 V(dc) and shall have a power input circuit breaker rated at 10 A to 12 A, 12 V(dc).

The design and circuitry of each emitter shall permit its use on vehicles with either negative or positive ground without disassembling or rewiring of the unit.

### **Mechanical**

Each emitter unit shall be housed in a weatherproof corrosion-resistant housing. The housing shall be provided with facilities to permit mounting on various types of vehicles and shall have provision for aligning the emitter unit properly and for locking the emitter unit into this alignment.

Each emitter control unit shall be provided with hardware to permit the unit to be mounted in or on an emergency vehicle or mass transit vehicle. Where required for certain emergency vehicles, the emitter control unit and exposed controls shall be weatherproof.

## **OPTICAL DETECTION/DISCRIMINATOR ASSEMBLY**

### **General**

Each optical detection/discriminator assembly shall consist of one or more optical detectors, connecting cable and a discriminator module.

Each assembly, when used with standard emitters, shall have a range of at least 300 m for Class I signals and 550 m for Class II signals. Standard emitters for both classes of signals shall be available from the manufacturer of the system. Range measurements shall be taken with all range adjustments on the discriminator module set to "maximum".

### **Optical Detector**

Each optical detector shall be a waterproof unit capable of receiving optical energy from two separately aimable directions. The horizontal angle between the 2 directions shall be variable from 180 degrees to 5 degrees.

The reception angle for each photocell assembly shall be a maximum of 8 degrees in all directions about the aiming axis of the assembly. Measurements of reception angle will be taken at a range of 300 m for a Type I emitter and at a range of 550 m for a Type II emitter.

Internal circuitry shall be solid state and electrical power shall be provided by the associated discriminator module.

Each optical detector shall be contained in a housing, which shall include 2 rotatable photocell assemblies, an electronic assembly and a base. The base shall have an opening to permit mounting on a mast arm or a vertical pipe nipple, or suspension from a span wire. The mounting opening shall have female threads for Size 21 conduit. A cable entrance shall be provided which shall have male threads and gasketing to permit a waterproof cable connection. Each detector shall have mass of less than 1.1 kg and shall present a maximum wind load area of 230 cm<sup>2</sup>. The housing shall be provided with weep holes to permit drainage of condensed moisture.

Each optical detector shall be installed, wired and aimed as specified by the manufacturer.

### **Cable**

Optical detector cable (EV-C) shall meet the requirements of IPCEA-S-61-402/NEMA WC 5, Section 7.4, 600-V(ac) control cable, 75°C, Type B, and the following:

- A. The cable shall contain 3 conductors, each of which shall be No. 20 (7 x 28) stranded, tinned copper with low-density polyethylene insulation. Minimum average insulation thickness shall be 0.63-mm. Insulation of individual conductors shall be color coded: 1-yellow, 1-blue, 1-orange.
- B. The shield shall be either tinned copper braid or aluminized polyester film with a nominal 20 percent overlap. Where film is used, a No. 20 (7 x 28) stranded, tinned, bare drain wire shall be placed between the insulated conductors and the shield and in contact with the conductive surface of the shield.
- C. The jacket shall be black polyvinyl chloride with minimum ratings of 600 V(ac) and 80°C and a minimum average thickness of 1.1 mm. The jacket shall be marked as required by IPCEA/NEMA.
- D. The finished outside diameter of the cable shall not exceed 8.9 mm.
- E. The capacitance, as measured between any conductor and the other conductors and the shield, shall not exceed 157 pf per meter at 1000 Hz.
- F. The cable run between each detector and the controller cabinet shall be continuous without splices or shall be spliced only as directed by the detector manufacturer.

### **Discriminator Module**

Each discriminator module shall be designed to be compatible and usable with a Model 2070 controller unit and to be mounted in the input file of a Model 332 or Model 336 controller cabinet, and shall conform to the requirements of Chapter I of the State of California, Department of Transportation, "Traffic Signal Control Equipment Specifications."

Each discriminator module shall be capable of operating two channels, each of which shall provide an independent output for each separate input.

Each discriminator module, when used with its associated detectors, shall perform the following:

- A. Receive Class I signals at a range of up to 300 m and Class II signals at a range of up to 550 m.
- B. Decode the signals, on the basis of frequency, at 9.639 Hz ± 0.119 Hz for Class I signals and 14.035 Hz ± 0.255 Hz for Class II signals.
- C. Establish the validity of received signals on the basis of frequency and length of time received. A signal shall be considered valid only when received for more than 0.50-second. No combination of Class I signals shall be recognized as a Class II signal regardless of the number of signals being received, up to a maximum of 10 signals. Once a valid signal has been recognized, the effect shall be held by the module in the event of temporary loss of the signal for a period adjustable from 4.5 seconds to 11 seconds in at least 2 steps at 5 seconds ± 0.5 second and 10 seconds ± 0.5 second.
- D. Provide an output for each channel that will result in a "low" or grounded condition of the appropriate input of a Model 2070 controller unit. For Class I signals the output shall be a 6.25 Hz ± 0.1 percent, rectangular waveform with a 50 percent duty cycle. For Class II signals the output shall be steady.

Each discriminator module shall receive electric power from the controller cabinet at either 24 V(dc) or 120 V(ac).

Each channel together with the channel's associated detectors shall draw not more than 100 mA at 24 V(dc) or more than 100 mA at 120 V(ac). Electric power, one detector input for each channel and one output for each channel shall terminate at the printed circuit board edge connector pins listed below:

BOARD EDGE CONNECTOR PIN ASSIGNMENT

A	DC ground		
B	+24 V(dc)	P	(NC)
C	(NC)		
D	Detector input, Channel A	R	(NC)
E	+24V(dc) to detectors	S	(NC)
F	Channel A output (C)	T	(NC)
		U	(NC)
H	Channel A output (E)	V	(NC)
J	Detector input, Channel B	W	Channel B Output (C)
K	DC Ground to detectors	X	Channel B Output (E)
L	Chassis ground	Y	(NC)
M	AC-	Z	(NC)
N	AC+		

(C) Collector, Slotted for Keying

(E) Emitter, Slotted for Keying

(NC) Not connected, cannot be used by manufacturer for any purpose.

Two auxiliary inputs for each channel shall enter each module through the front panel connector. Pin assignment for the connector shall be as follows:

- A. Auxiliary detector 1 input, Channel A
- B. Auxiliary detector 2 input, Channel A
- C. Auxiliary detector 1 input, Channel B
- D. Auxiliary detector 2 input, Channel B

Each channel output shall be an optically isolated NPN open collector transistor capable of sinking 50 mA at 30 V(ac) and shall be compatible with the Model 2070 controller unit inputs.

Each discriminator module shall be provided with means of preventing transients received by the detector from affecting the Model 2070 controller assembly.

Each discriminator module shall have a single connector board and shall occupy one slot width of the input file. The front panel of each module shall have a handle to facilitate withdrawal and the following controls and indicators for each channel:

- A. Three separate range adjustments each for both Class I and Class II signals.
- B. A 3-position, center-off, momentary contact switch, one position (down) labeled for test operation of Class I signals, and one position (up) labeled for test operation of Class II signals.
- C. A "signal" indication and a "call" indication each for Class I and for Class II signals. The "signal" indication denotes that a signal above the threshold level has been received. A "call" indication denotes that a steady, validly coded signal has been received. These 2 indications may be accomplished with a single indication lamp; "signal" being denoted by a flashing indication and "call" with a steady indication.

In addition, the front panel shall be provided with a single circular, bayonet-captured, multi-pin connector for 2 auxiliary detector inputs for each channel. Connector shall be a mechanical configuration conforming to the requirements in Military Specification MIL-C-26482 with 10-4 insert arrangement, such as Burndy Trim Trio Bantamate Series, consisting of the following:

- A. Wall mounting receptacle, G0B10-4PNE with SM20M-1S6 gold plated pins.
- B. Plug, G6L10-4SNE with SC20M-1S6 gold plated sockets, cable clamp and strain relief that shall provide for a right angle turn within 65 mm maximum from the front panel surface of the discriminator module.

**Cabinet Wiring**

The Model 332 cabinet has provisions for connections between the optical detectors, the discriminator module and the Model 2070 controller unit.

Wiring for a Model 332 cabinet shall conform to the following:

- A. Slots 12 and 13 of input file "J" have each been wired to accept a 2-channel module.
- B. Field wiring for the primary detectors, except 24-V(dc) power, shall terminate on either terminal board TB-9 in the controller cabinet or on the rear of input file "J," depending on cabinet configuration. Where TB-9 is used, position assignments shall be as follows:

Position	Assignment
4	Channel A detector input, 1st module (Slot J-12)
5	Channel B detector input, 1st module (Slot J-12)
7	Channel A detector input, 2nd module (Slot J-13)
8	Channel B detector input, 2nd module (Slot J-13)

The 24-V(dc) cabinet power will be available at Position 1 of terminal board TB-1 in the controller cabinet.

Field wiring for the auxiliary detectors shall terminate on terminal board TB-O in the controller cabinet. Position assignments are as follows:

FOR MODULE 1 (J-12)		FOR MODULE 2 (J-13)	
Position	Assignment	Position	Assignment
1	+24V(dc) from (J-12E)	7	+24V(dc) from (J-13E)
2	Detector ground From (J-12K)	8	Detector ground from (J-13K)
3	Channel A auxiliary detector input 1	9	Channel A auxiliary detector input 1
4	Channel A auxiliary detector input 2	10	Channel A auxiliary detector input 2
5	Channel B auxiliary detector input 1	11	Channel B auxiliary detector input 1
6	Channel B auxiliary detector input 2	12	Channel B auxiliary detector input 2

**SYSTEM OPERATION**

The Contractor shall demonstrate that the components of each system are compatible and will perform satisfactorily as a system. Satisfactory performance shall be determined using the following test procedure during the functional test period:

- A. Each system to be used for testing shall consist of an optical emitter assembly, an optical detector, an optical detector cable and a discriminator module.
- B. The discriminator modules shall be installed in the proper input file slot of the Model 2070 controller assembly.
- C. Two tests shall be conducted; one using a Class I signal emitter and a distance of 300 m between the emitter and the detector, the other using a Class II signal emitter and a distance of 550 m between the emitter and the detector. Range adjustments on the module shall be set to "Maximum" for each test.
- D. Each test shall be conducted for a period of one hour, during which the emitter shall be operated for 30 cycles, each consisting of a one minute "on" interval and a one minute "off" interval. During the total test period the emitter signal shall cause the proper response from the Model 2070 controller unit during each "on" interval and there shall be no improper operation of either the Model 2070 controller unit or the monitor during each "off" interval.

**10-3.17 PHOTOELECTRIC CONTROLS**

Contactors shall be the mercury type.

**10-3.18 REMOVING, REINSTALLING OR SALVAGING ELECTRICAL EQUIPMENT**

Salvaged electrical materials shall be hauled to 50 Higuera Street, San Louis Obispo, CA, 93401 and stockpiled.

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

**10-3.19 PAYMENT**

The contract lump sum prices paid for modify signal and lighting shall include highway lighting at intersections in connection with signals only.

Other lighting on the project shall be considered as included in the contract lump sum price paid for modify lighting.

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

Full compensation for installing the battery backup system shall be considered as included in the contract lump sum price paid for modify signal and lighting at the locations involved and no separate payment will be made therefor.

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

#### **SECTION 11. (BLANK)**

#### **SECTION 12. (BLANK)**

### **SECTION 13. RELATIONS WITH RAILROAD**

#### **13-1.01 GENERAL**

The Contractor's attention is directed to the tracks and right-of-way of the Union Pacific Railroad Company at the Las Posidas Overcrossing (P.M. 16.55), on State Route 101 in Santa Barbara, hereinafter referred to as "Railroad", within the limits of the project.

In accordance with the provisions in Section 7-1.12, "Indemnification and Insurance," of the Standard Specifications, the Contractor shall be responsible for all damages to Railroad's track and equipment operating on such track, resulting from his operations.

The Contractor shall not allow any personnel or equipment on Railroad's tracks or right of way.

The Contractor shall conduct his operation in a manner that will prevent debris or any other material from falling onto the tracks and right of way of the Railroad.