



STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

**NOTICE TO BIDDERS
AND
SPECIAL PROVISIONS**

**FOR CONSTRUCTION ON STATE HIGHWAY IN LOS ANGELES COUNTY IN
PASADENA AT THE WESTBOUND MOUNTAIN STREET ON/OFF RAMPS**

In District 07 On Route 210

Under

Bid book dated May 28, 2013

Standard Specifications dated 2010

Project plans approved March 11, 2013

Standard Plans dated 2010

Identified by

Contract No. 07-4T5804

07-LA-210-R24.2

Project ID 0712000128

Federal-Aid Project

ACHSNHPIG-210-1(814)E

Electronic Advertising Contract

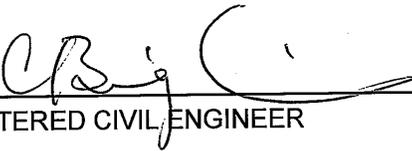
SPECIAL NOTICES

- For federal-aid projects, the Department is modifying its DBE program.

CONTRACT NO. 07-4T5804

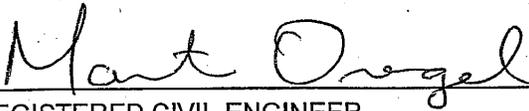
The special provisions contained herein
have been prepared by or under the
direction of the following Registered
Persons.

HIGHWAYS


REGISTERED CIVIL ENGINEER



MAINTAINING TRAFFIC


REGISTERED CIVIL ENGINEER



ELECTRICAL


REGISTERED ELECTRICAL ENGINEER

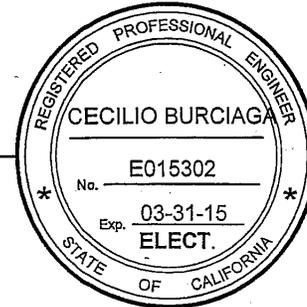


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STANDARD PLANS LIST

The standard plan sheets applicable to this Contract include those listed below. The applicable revised standard plans (RSPs) listed below are included in the project plans.

| | |
|----------|---|
| A10A | Abbreviations (Sheet 1 of 2) |
| A10B | Abbreviations (Sheet 2 of 2) |
| A10C | Lines and Symbols (Sheet 1 of 3) |
| A10D | Lines and Symbols (Sheet 2 of 3) |
| A10E | Lines and Symbols (Sheet 3 of 3) |
| A20A | Pavement Markers and Traffic Lines, Typical Details |
| A20B | Pavement Markers and Traffic Lines, Typical Details |
| A20C | Pavement Markers and Traffic Lines, Typical Details |
| A20D | Pavement Markers and Traffic Lines, Typical Details |
| RSP A24A | Pavement Markings - Arrows |
| A24B | Pavement Markings - Arrows and Symbols |
| A73C | Delineators, Channelizers and Barricades |
| A88A | Curb Ramp Details |
| A88B | Curb Ramp and Island Passageway Details |
| T1A | Temporary Crash Cushion, Sand Filled (Unidirectional) |
| T1B | Temporary Crash Cushion, Sand Filled (Bidirectional) |
| T2 | Temporary Crash Cushion, Sand Filled (Shoulder Installations) |
| T3A | Temporary Railing (Type K) |
| T3B | Temporary Railing (Type K) |
| T59 | Temporary Water Pollution Control Details (Temporary Concrete Washout Facility) |
| T61 | Temporary Water Pollution Control Details (Temporary Drainage Inlet Protection) |
| T62 | Temporary Water Pollution Control Details (Temporary Drainage Inlet Protection) |
| T63 | Temporary Water Pollution Control Details (Temporary Drainage Inlet Protection) |
| T64 | Temporary Water Pollution Control Details (Temporary Drainage Inlet Protection) |
| RS1 | Roadside Signs, Typical Installation Details No. 1 |
| RS2 | Roadside Signs - Wood Post, Typical Installation Details No. 2 |
| RS4 | Roadside Signs, Typical Installation Details No. 4 |
| ES-1A | Electrical Systems (Legend, Notes and Abbreviations) |
| ES-1B | Electrical Systems (Legend, Notes and Abbreviations) |
| ES-1C | Electrical Systems (Legend, Notes and Abbreviations) |

| | |
|------------|--|
| ES-2A | Electrical Systems (Service Equipment) |
| ES-2C | Electrical Systems (Service Equipment Notes, Type III Series) |
| ES-2F | Electrical Systems (Service Equipment Enclosure and Typical Wiring Diagram Type III - C Series) |
| ES-3C | Electrical Systems (Controller Cabinet Foundation Details) |
| ES-4A | Electrical Systems (Signal Heads and Mountings) |
| ES-4B | Electrical Systems (Pedestrian Signal and Ramp Metering) |
| ES-4C | Electrical Systems (Vehicular Signal Heads and Mountings) |
| ES-4D | Electrical Systems (Signal Mounting) |
| ES-4E | Electrical Systems (Signal Faces and Emergency Vehicle Detector Mountings) |
| ES-5A | Electrical Systems (Detectors) |
| ES-5B | Electrical Systems (Detectors) |
| ES-5C | Electrical Systems (Detector, Pedestrian Push Button and Signs) |
| ES-5D | Electrical Systems (Curb Termination and Handhole) |
| ES-6A | Electrical Systems (Lighting Standard, Types 15 and 21) |
| ES-6B | Electrical Systems (Electrolier Anchorage and Grouting for Types 15 and 21, Barrier Rail Mounted) |
| ES-7A | Electrical Systems (Signal and Lighting Standard, Type TS, and Pedestrian Push Button Post) |
| ES-7B | Electrical Systems (Signal and Lighting Standard - Type 1 and Equipment Numbering) |
| ES-7E | Electrical Systems (Signal and Lighting Standard - Case 3 Signal Mast Arm Loading, Wind Velocity = 100 mph and Signal Mast Arm Lengths 15' to 45') |
| ES-7F | Electrical Systems (Signal and Lighting Standard - Case 4 Signal Mast Arm Loading, Wind Velocity = 100 mph and Signal Mast Arm Lengths 25' to 45') |
| ES-7M | Electrical Systems (Signal and Lighting Standard - Detail No. 1) |
| ES-7N | Electrical Systems (Signal and Lighting Standard - Detail No. 2) |
| ES-7O | Electrical Systems (Signal and Lighting Standard - Detail No. 3) |
| ES-7P | Electrical Systems (Internally Illuminated Street Name Sign) |
| ES-7R | Electrical Systems (Signal and Lighting, Miscellaneous Attachment) |
| RSP ES-8A | Electrical Systems (Pull Box) |
| RSP ES-8B | Electrical Systems (Traffic Rated Pull Box) |
| RSP ES-10A | Electrical Systems (Isofootcandle Diagrams) |
| RSP ES-10B | Electrical Systems (Isofootcandle Diagrams) |
| ES-11 | Electrical Systems (Foundation Installations) |
| ES-13A | Electrical Systems (Splicing Details) |
| ES-13B | Electrical Systems (Fuse Rating, Kinking and Banding Detail) |

CANCELED STANDARD PLANS LIST

The standard plan sheets listed below are canceled and not applicable to this contract.

| | |
|-------|------------------------------|
| B3-1 | Canceled on April 20, 2012 |
| B3-2 | Canceled on April 20, 2012 |
| B3-3 | Canceled on April 20, 2012 |
| B3-4 | Canceled on April 20, 2012 |
| B3-7 | Canceled on April 20, 2012 |
| B3-8 | Canceled on April 20, 2012 |
| ES-8 | Canceled on January 20, 2012 |
| ES-10 | Canceled on July 20, 2012 |

NOTICE TO BIDDERS

Bids open Thursday, June 20, 2013

Dated May 28, 2013

General work description: Install traffic signal and construct ADA curb ramps.

The Department will receive sealed bids for CONSTRUCTION ON STATE HIGHWAY IN LOS ANGELES COUNTY IN THE CITY OF PASADENA ON ROUTE 210 AT THE WESTBOUND MOUNTAIN STREET ON/OFF RAMPS.

District-County-Route-Post Mile: 07-LA-210-R24.2

Contract No. 07-4T5804

The Contractor must have either a Class A license or one of the following Class C licenses: C-10.

The DBE Contract goal is 11 percent.

Federal-aid project no.:

ACHSNHPIG-210-1(814)E

Bids must be on a unit price basis.

Complete the work within 40 working days.

The estimated cost of the project is \$310,000.

No prebid meeting is scheduled for this project.

The Department will receive bids until 2:00 p.m. on the bid open date at 3347 Michelson Drive, Suite 100, Irvine, CA 92612-1692. Bids received after this time will not be accepted.

The Department will open and publicly read the bids at the above location immediately after the specified closing time.

District office addresses are provided in the *Standard Specifications*.

Present bidders' inquiries to the Department and view the Department's responses at:

http://www.dot.ca.gov/hq/esc/oe/project_status/bid_inq.html

Questions about alleged patent ambiguity of the plans, specifications, or estimate must be asked before bid opening. After bid opening, the Department does not consider these questions as bid protests.

Submit your bid with bidder's security equal to at least 10 percent of the bid.

Prevailing wages are required on this Contract. The Director of the California Department of Industrial Relations determines the general prevailing wage rates. Obtain the wage rates at the DIR Web site, <http://www.dir.ca.gov>, or from the Department's Labor Compliance Office of the district in which the work is located.

The federal minimum wage rates for this Contract as determined by the United States Secretary of Labor are available at <http://www.dot.ca.gov/hq/esc/oe/federal-wages>.

If the minimum wage rates as determined by the United States Secretary of Labor differs from the general prevailing wage rates determined by the Director of the California Department of Industrial Relations for similar classifications of labor, the Contractor and subcontractors must not pay less than the higher wage rate. The Department does not accept lower State wage rates not specifically included in the federal minimum wage determinations. This includes helper, or other classifications based on hours of experience, or any other classification not appearing in the federal wage determinations. Where federal wage determinations do not contain the State wage rate determination otherwise available for use by the

Contractor and subcontractors, the Contractor and subcontractors must not pay less than the federal minimum wage rate that most closely approximates the duties of the employees in question.

The Department has made available Notices of Suspension and Proposed Debarment from the Federal Highway Administration. For a copy of the notices, go to http://www.dot.ca.gov/hq/esc/oe/contractor_info. Additional information is provided in the Excluded Parties List System at <https://www.epls.gov>.

Department of Transportation

JRG

BID ITEM LIST

| Item No. | Item Code | Item Description | Unit of Measure | Estimated Quantity |
|----------|-----------|--|-----------------|--------------------|
| 1 | 070030 | LEAD COMPLIANCE PLAN | LS | LUMP SUM |
| 2 | 120090 | CONSTRUCTION AREA SIGNS | LS | LUMP SUM |
| 3 | 120100 | TRAFFIC CONTROL SYSTEM | LS | LUMP SUM |
| 4 | 120116 | TYPE II BARRICADE | EA | 12 |
| 5 | 130100 | JOB SITE MANAGEMENT | LS | LUMP SUM |
| 6 | 130200 | PREPARE WATER POLLUTION CONTROL PROGRAM | LS | LUMP SUM |
| 7 | 130620 | TEMPORARY DRAINAGE INLET PROTECTION | EA | 2 |
| 8 | 130900 | TEMPORARY CONCRETE WASHOUT | LS | LUMP SUM |
| 9 | 150715 | REMOVE THERMOPLASTIC PAVEMENT MARKING | SQFT | 310 |
| 10 | 150722 | REMOVE PAVEMENT MARKER | EA | 130 |
| 11 | 153121 | REMOVE CONCRETE (CY) | CY | 28 |
| 12 | 560251 | FURNISH SINGLE SHEET ALUMINUM SIGN (0.063"-FRAMED) | SQFT | 31 |
| 13 | 566011 | ROADSIDE SIGN - ONE POST | EA | 1 |
| 14 | 568015 | INSTALL SIGN (MAST-ARM HANGER METHOD) | EA | 1 |
| 15 | 730070 | DETECTABLE WARNING SURFACE | SQFT | 130 |
| 16 | 731627 | MINOR CONCRETE (CURB, SIDEWALK AND CURB RAMP) | CY | 28 |
| 17 | 840504 | 4" THERMOPLASTIC TRAFFIC STRIPE | LF | 210 |
| 18 | 840506 | 8" THERMOPLASTIC TRAFFIC STRIPE | LF | 240 |
| 19 | 840515 | THERMOPLASTIC PAVEMENT MARKING | SQFT | 410 |
| 20 | 840526 | 4" THERMOPLASTIC TRAFFIC STRIPE (BROKEN 17-7) | LF | 250 |

| Item No. | Item Code | Item Description | Unit of Measure | Estimated Quantity |
|----------|-----------|---|-----------------|--------------------|
| 21 | 860090 | MAINTAINING EXISTING TRAFFIC MANAGEMENT SYSTEM ELEMENTS DURING CONSTRUCTION | LS | LUMP SUM |
| 22 | 860201 | SIGNAL AND LIGHTING | LS | LUMP SUM |
| 23 | 860400 | LIGHTING (TEMPORARY) | LS | LUMP SUM |
| 24 | 860705 | INTERCONNECTION CONDUIT AND CABLE (LS) | LS | LUMP SUM |
| 25 | 861088 | MODIFY RAMP METERING SYSTEM | LS | LUMP SUM |
| 26 | 025599 | MODIFY LIGHTING (CITY) | LS | LUMP SUM |
| 27 | 025600 | MODIFY SIGNAL AND LIGHTING (CITY) | LS | LUMP SUM |
| 28 | 999990 | MOBILIZATION | LS | LUMP SUM |

AA

**DIVISION II GENERAL CONSTRUCTION
10 GENERAL**

Add to section 10-1.02 of the RSS for section 10-1:

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

AA

12 TEMPORARY TRAFFIC CONTROL

Replace the 1st paragraph of section 12-4.02A with:

Work that interferes with traffic is limited to the hours when closures are allowed.

Delete the 2nd through 5th paragraphs of section 12-4.02A.

Replace the 6th paragraph of section 12-4.02A with:

If a minor deviation from the requirements of this section regarding hours of work is required, submit a request at least 15 days before the proposed date of closure. If no significant increase in cost is accrued to the Department and the work can be expedited and better serve the traffic, the deviation may be authorized.

Add to section 12-4.02A:

Closure of the adjacent traffic lane is not required for installing, maintaining, and removing Category 1 and 2 traffic control devices.

The full width of the ramp traveled way must be open for use by traffic on designated holidays.

Designated holidays are as shown in the following table:

| Designated Holidays | |
|----------------------------|--------------------------|
| Holiday | Date observed |
| New Year's Day | January 1st |
| Washington's Birthday | 3rd Monday in February |
| Memorial Day | Last Monday in May |
| Independence Day | July 4th |
| Labor Day | 1st Monday in September |
| Veterans Day | November 11th |
| Thanksgiving Day | 4th Thursday in November |
| Christmas Day | December 25th |

If a designated holiday falls on a Sunday, the following Monday is a designated holiday. If November 11th falls on a Saturday, the preceding Friday is a designated holiday.

Special days are: Martin Luther King Jr, Halloween and Columbus Day.

If an off-ramp is closed, install special signs for exit ramp closures, SP-3 or SP-5, and place the sign on the right shoulder of the freeway upstream of the preceding off-ramp.

If a ramp closure is allowed, post a special advance notice publicity sign, SP-1, as shown at an authorized location, at least 7 days before the ramp closure. Maintain accurate information on the sign and remove or cover sign when work is not actively in progress.

From 3 hours before to 2 hours after Rose Bowl events, work that encroaches onto the following ramps will not be allowed:

1. EB Route 210: Mountain St off-ramp
2. EB Route 210: Mountain St on-ramp
3. WB Route 210: Mountain St off-ramp
4. WB Route 210: Mountain St on-ramp

You may close Mountain St traffic lanes during the hours shown on Chart no. 5 for traffic signal installation and loop detector installation.

Do not perform work on city streets that interferes with traffic between 0600 and 0900 or between 1500 and 1900 hours.

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

If work vehicles or equipment are parked within 6 feet of a traffic lane, close the shoulder area with fluorescent orange traffic cones or portable delineators. Place the cones or delineators on a taper in advance of the parked vehicles or equipment and along the edge of the pavement at 25-foot intervals to a point not less than 25 feet past the last vehicle or piece of equipment. Use at least 9 cones or delineators for the taper. Use W21-5, "Shoulder Work," W21-5b, "Right/Left Shoulder Closed Ahead," and C30A(CA), "Shoulder Closed," signs mounted on crashworthy, portable sign supports with flags. The signs must be placed at an authorized location and at least 48 by 48 inches in size. If a cone or delineator is displaced or overturned, immediately restore the device to its original position or location.

Replace "Sunday" at each occurrence in the 1st paragraph of section 12-4.03 with:

Friday

Replace the 3rd paragraph of section 12-4.03 with:

Use the online Lane Closure System (LCS) and show the locations and times of the proposed closures. Closure schedules submitted with incomplete or inaccurate information will be rejected and returned for correction and resubmittal online. You will be notified of unauthorized closures or closures that require coordination with other parties as a condition for authorization. Fifteen days before submitting the 1st lane closure request, contact the Engineer to schedule for the required LCS training. For the LCS, go to:

<http://lcs.dot.ca.gov>

Replace the 4th paragraph of section 12-4.03 with:

Using LCS, submit closure schedule amendments, including adding additional closures, by noon at least 3 business days before a planned closure. Authorization of amendments will be at the discretion of the Engineer.

Replace the 5th paragraph of section 12-4.03 with:

Using LCS, cancel lane closure requests at least 2 business days before the date of the closure.

Replace "Reserved" in section 12-4.05E with:

| Chart no. 1 | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|--|----|---|---|---------------------------|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| Complete Ramp Closure Hours/Ramp Lane Requirements and Hours of Work | | | | | | | | | | | | | | | | | | | | | | | | | | |
| County: LA | | | | | Route/Direction: 210/East | | | | | | | | | | | | | | | | | | | | | |
| Closure limits: Mountain St off-ramp | | | | | | | | | | | | | | | | | | | | | | | | | | |
| From hour to hour | | 24 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 |
| Mondays through Thursdays | | C | C | C | C | C | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | C | C |
| Fridays | | C | C | C | C | C | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | C | C |
| Saturdays | | C | C | C | C | C | C | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | C | C |
| Sundays | | C | C | C | C | C | C | C | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | C | C |

Legend:

C Ramp may be closed completely

N No work allowed

| Chart no. 2 | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|--|----|---|---|---------------------------|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| Complete Ramp Closure Hours/Ramp Lane Requirements and Hours of Work | | | | | | | | | | | | | | | | | | | | | | | | | | |
| County: LA | | | | | Route/Direction: 210/East | | | | | | | | | | | | | | | | | | | | | |
| Closure limits: Mountain St on-ramp | | | | | | | | | | | | | | | | | | | | | | | | | | |
| From hour to hour | | 24 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 |
| Mondays through Thursdays | | C | C | C | C | C | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | C | C |
| Fridays | | C | C | C | C | C | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | C | C |
| Saturdays | | C | C | C | C | C | C | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | C | C |
| Sundays | | C | C | C | C | C | C | C | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | C | C |

Legend:

C Ramp may be closed completely

N No work allowed

REMARKS: Detour eastbound traffic to continue east on Mountain St; south on Fair Oaks Ave to the on-ramps to Route 134/210. Post at least 7 special portable freeway detour signs, SP-2, along the detour route and remove signs at the end of each closure.
 Detour westbound traffic south on Lincoln Ave; east on Orange Grove Blvd; south on Fair Oaks Ave to the on-ramps to Route 134/210. Post at least 14 special portable freeway detour signs, SP-2, along the detour route and remove signs at the end of each closure.

| Chart no. 3 | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|--|-------------------------------|---|---|---------------------------|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| Complete Ramp Closure Hours/Ramp Lane Requirements and Hours of Work | | | | | | | | | | | | | | | | | | | | | | | | | | |
| County: LA | | | | | Route/Direction: 210/West | | | | | | | | | | | | | | | | | | | | | |
| Closure limits: Mountain St off-ramp | | | | | | | | | | | | | | | | | | | | | | | | | | |
| From hour to hour | | 24 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 |
| Mondays through Thursdays | | C | C | C | C | C | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | C |
| Fridays | | C | C | C | C | C | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | C |
| Saturdays | | C | C | C | C | C | C | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | C |
| Sundays | | C | C | C | C | C | C | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | C |
| Legend: | | | | | | | | | | | | | | | | | | | | | | | | | | |
| C | | Ramp may be closed completely | | | | | | | | | | | | | | | | | | | | | | | | |
| N | | No work allowed | | | | | | | | | | | | | | | | | | | | | | | | |

| Chart no. 4 | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|--|-------------------------------|---|---|---------------------------|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| Complete Ramp Closure Hours/Ramp Lane Requirements and Hours of Work | | | | | | | | | | | | | | | | | | | | | | | | | | |
| County: LA | | | | | Route/Direction: 210/West | | | | | | | | | | | | | | | | | | | | | |
| Closure limits: Mountain St on-ramp | | | | | | | | | | | | | | | | | | | | | | | | | | |
| From hour to hour | | 24 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 |
| Mondays through Thursdays | | C | C | C | C | C | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | C |
| Fridays | | C | C | C | C | C | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | C |
| Saturdays | | C | C | C | C | C | C | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | C |
| Sundays | | C | C | C | C | C | C | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | C |
| Legend: | | | | | | | | | | | | | | | | | | | | | | | | | | |
| C | | Ramp may be closed completely | | | | | | | | | | | | | | | | | | | | | | | | |
| N | | No work allowed | | | | | | | | | | | | | | | | | | | | | | | | |
| REMARKS: Detour eastbound traffic to continue east on Mountain St; north on Fair Oaks Ave; west on Washington Blvd; north on Lincoln Ave to the on-ramp to westbound Route 210. Post at least 20 special portable freeway detour signs, SP-2, along the detour route and remove signs at the end of each closure. Detour westbound traffic to continue west on Mountain St; north on Lincoln Ave to the on-ramp to westbound Route 210. Post at least 10 special portable freeway detour signs, SP-2, along the detour route and remove signs at the end of each closure. | | | | | | | | | | | | | | | | | | | | | | | | | | |

Replace section 12-4.05H with:

| Chart no. 5 Complete City Street Closure Hours/City Street Requirements and Hours of Work | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|------------------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| Location: Route 210: Mountain St | | | | | | | | | | Direction: East / West | | | | | | | | | | | | | | | |
| From hour to hour | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 24 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 |
| Mondays through Thursdays | 1 | 1 | 1 | 1 | 1 | 1 | N | N | N | 1 | 1 | 1 | 1 | 1 | 1 | N | N | N | N | 1 | 1 | 1 | 1 | 1 | |
| Fridays | 1 | 1 | 1 | 1 | 1 | 1 | N | N | N | 1 | 1 | 1 | 1 | 1 | 1 | N | N | N | N | 1 | 1 | 1 | 1 | 1 | |
| Saturdays | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | |
| Sundays | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | |
| Legend: | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | Provide at least 1 city street lane open in direction of travel | | | | | | | | | | | | | | | | | | | | | | | | |
| N | No work allowed | | | | | | | | | | | | | | | | | | | | | | | | |
| REMARKS: The number of through traffic lanes in each direction of travel is 2. | | | | | | | | | | | | | | | | | | | | | | | | | |

Replace section 12-5 with:

12-5 TRAFFIC CONTROL SYSTEM FOR LANE CLOSURE

12-5.01 GENERAL

Section 12-5 includes specifications for closing traffic lanes, ramps, or a combination, with stationary lane closures on multilane highways. The traffic control system for a lane closure or a ramp closure must comply with the details shown.

Traffic control system includes signs.

12-5.02 MATERIALS

Not Used

12-5.03 CONSTRUCTION

Each vehicle used to place, maintain, and remove components of a traffic control system on a multilane highway must be equipped with a Type II flashing arrow sign that must be in operation whenever the vehicle is being used for placing, maintaining, or removing the components. Vehicles equipped with a Type II flashing arrow sign not involved in placing, maintaining, or removing the components if operated within a stationary-type lane closure must display only the caution display mode. The sign must be controllable by the operator of the vehicle while the vehicle is in motion. If a flashing arrow sign is required for a lane closure, the flashing arrow sign must be operational before the lane closure is in place.

Whenever components of the traffic control system are displaced or cease to operate or function as specified from any cause, immediately repair the components to the original condition or replace the components and restore the components to the original location.

For a stationary lane closure, ramp closure, or a combination, made only for the work period, remove the components of the traffic control system from the traveled way and shoulder, except for portable delineators placed along open trenches or excavation adjacent to the traveled way at the end of each work period. You may store the components at selected central locations designated by the Engineer within the limits of the highway.

12-5.04 PAYMENT

Traffic control system for lane closure is paid for as traffic control system.

The requirements in section 4-1.05 for payment adjustment do not apply to traffic control system. Adjustments in compensation for traffic control system will be made for an increase or decrease in traffic control work if ordered and will be made on the basis of the cost of the necessary increased or decreased traffic control. The adjustment will be made on a force account basis for increased work and estimated on the same basis in the case of decreased work.

A traffic control system required by change order work is paid for as a part of the change order work.

AA

14 ENVIRONMENTAL STEWARDSHIP

Replace section 14-11.04 with:

14-11.04 MINIMAL DISTURBANCE OF MATERIAL CONTAINING HAZARDOUS WASTE CONCENTRATIONS OF AERIALY DEPOSITED LEAD

14-11.04A General

14-11.04A(1) Summary

Section 14-11.04 includes specifications for minimal disturbance of material containing hazardous waste concentrations of Aerially Deposited Lead (ADL).

Compliance with 22 CA Code of Regs is not required where there is minimal disturbance of hazardous waste concentrations of ADL.

14-11.04A(2) Project Conditions

Hazardous waste concentrations of ADL are typically found within the top 2 feet of material in unpaved areas of the highway.

Levels found in the area of minimal disturbance range from less than 5.1 to 690 mg/kg total lead, as analyzed by US EPA Method 6010 or US EPA Method 7000 series.

Minimal disturbance of hazardous waste concentrations of ADL will occur at the following locations:

- 1. Pull box installation location
- 2. Conduit installation location

14-11.04A(3) Quality Control and Assurance

Handling material containing aerially deposited lead must comply with rules and regulations of the following agencies:

- 1. Cal/OSHA
- 2. RWQCB, Region 4-Los Angeles

14-11.04A(4) Lead Compliance Plan

Submit a lead compliance plan under section 7-1.02K(6)(j)(ii).

14-11.04B Materials

Not Used

14-11.04C Construction

14-11.04C(1) General

Not Used

48-6.01D Quality Control and Assurance

48-6.01D(1) General

Reserved

48-6.01D(2) Welding and Nondestructive Testing

Welding must comply with AWS D1.1 or other recognized welding standard except (1) for previously welded splices and (2) if fillet welds are used where load demands are 1,000 lb or less per inch for each 1/8 inch of fillet weld.

Perform NDT on splices made by field welding at the job site. You may use UT or RT. Each field weld and any repair made to a previously welded splice must be tested. You must select locations for testing. The length of a splice weld where NDT is to be performed must be a cumulative weld length equal to 25 percent of the original splice weld length. The cover pass must be ground smooth at test locations. Acceptance criteria must comply with the specifications for cyclically loaded nontubular connections subject to tensile stress in clause 6 of AWS D1.1. If repairs are required in a portion of the weld, perform additional NDT on the repaired sections. The NDT method chosen must be used for an entire splice evaluation, including any repairs.

For previously welded splices, you must determine and perform all necessary testing and inspection required to certify the ability of the temporary structural support members to sustain the design stresses.

48-6.02 MATERIALS

48-6.02A General

Wire used for messenger wires, tether wires, and guy wires, must comply with ASTM A475, Utilities Grade, 7-wire strand.

Connection hardware for wires must provide termination efficiency factor of not less than 0.80.

Wood poles, push braces, and stubs must comply with Alliance for Telecommunications Industry Solutions O5.1.

Treat wood under AWPA U1, Use Category UC4B, Commodity Specification D.

Other steel components must comply with section 86.

48-6.02B Helical Anchors, Expanded Steel Plate Anchors, Cross Plate Anchors, and Expanding Rock Anchors

Fabricate helical anchors, expanded steel plate anchors, and cross plate anchors under section 55.

Fabricate attachable thimble eyes and expanding rock anchors from suitable ferrous material.

Welding must comply with AWS D1.1.

Fabricate as a continuous piece or as separate segments with mechanical connections between segments. Include integral thimble eye or include attachable thimble eye.

Galvanize all helical anchor parts under section 75.

Paint expanded steel plate anchors, cross plate anchors, and expanding rock anchors as specified for repairing damaged galvanized surfaces in section 75-1.05.

The final assembly must have (1) a minimum ultimate tension strength greater than the minimum required breaking strength of the guy wire, and (2) a minimum ultimate torsion strength greater than twice the minimum installation torque.

48-6.02C Reuse of Materials and Relocation of Temporary Supports

You may reuse structural components and relocate temporary supports provided that the materials remain in acceptable condition for reuse except do not reuse:

1. Components of galvanized high-strength-bolt assemblies that have been or are required to be tensioned past snug tight
2. Galvanized high-strength cap-screws that have been or are required to be tensioned past snug tight
3. Tension control bolts

48-6.03 CONSTRUCTION

48-6.03A General

Install construction bracing as necessary to withstand all imposed loads during erection, construction, and removal of any temporary structural supports.

Install Type K temporary railing on both sides of vehicular openings through temporary structural supports. The Engineer may order you to install temporary railing at other temporary structural supports less than 12 feet from the edge of a traffic lane.

Install all temporary railing protecting temporary structural supports before erecting temporary structural supports. Do not remove temporary railing until authorized.

For overhead line construction not specifically covered in the contract documents, comply with Public Utility Commission General Order No. 95

48-6.03B Foundations

Verify the design soil parameters before starting construction of temporary wood poles.

Remove any accumulated water from the pole excavation prior to placing granular backfill at the bottom of the pole excavation. Thoroughly compact and level the granular backfill at the bottom of pole excavation prior to setting pole.

Backfill around poles with manufactured sand that is free of rocks or other deleterious material. Place the backfill material in 4-inch thick layers. Moisten and thoroughly compact each layer.

Install required pull boxes at least 2 feet clear from face of pole.

Remove accumulated water from the anchor excavation prior to placing expanded steel anchor. Expand the base of the expanded steel anchor prior to placing backfill. Place backfill around expanded steel anchor in 4-inch thick layers. Thoroughly compact each layer.

Protect foundations from softening and undermining.

48-6.03C Erection

If temporary structural supports are over or adjacent to roadways or railroads, all details of the temporary structural support system that contribute to horizontal stability and resistance to impact, except for connections in bracing, must (1) be installed at the time each element of the temporary structural support is erected, and (2) remain in place until the temporary structural support is removed.

Suspend overhead conductors from messenger wire by continuous lashing wire. No spare overhead conductors are allowed unless described. Sag the overhead bundles to maintain required clearances and sags over the temperature range of -30 to 120 degrees F. Required sag is between 4.6 and 5.4 percent of horizontal span unless shown. Minimum vertical clearance over grade is 25 feet unless shown. Sag tether wires to maintain approximately uniform separation from their overhead bundles.

48-6.03D Attachments

If specific connection details are not shown, mount attachments under the manufacturer's written instructions so there is no loss of structural component cross section.

48-6.03E Damping

If at any time during service, the temporary wood poles exhibit excessive vibration, immediately install dampers. Dampers must be effective in mitigating the vibration and must not compromise the temporary wood poles or the supported hardware.

48-6.03F Removal

Remove temporary wood poles so portions not yet removed remain stable at all times.

Remove temporary wood poles and helical anchors. Fill the void with excavated material or sand that is free of deleterious material. Place the backfill material in 4-inch thick layers. Moisten and thoroughly compact each layer.

Dispose of surplus excavated material uniformly along the adjacent roadway.

Dispose of temporary structural support materials and work debris.

48-6.03G Guy Wire Helical Anchors

48-6.03G(1) General

Reserved

48-6.03G(2) Installation Parameters

Use the minimum installation torque shown. You may request an alternative minimum installation torque based on a revised value for empirical torque factor.

For alternative minimum installation torque, use the following equation to calculate the installation torque:

$$T = Q_a(FS/K_t)$$

where:

T = Minimum installation torque, lb-ft

FS = Factor of safety of 2.0

Q_a = Minimum allowable tension capacity shown, lb

K_t = Empirical torque factor, 1/ft (inverse foot)

Include a geotechnical report sealed by a licensed geotechnical engineer with recommended values for empirical torque factor and alternative minimum installation torque with your request.

Do not start installation unless your alternative installation parameters are authorized.

Verify the installation parameters before the start of anchor installation.

48-6.03G(3) Installation

Install under the anchor manufacturer's written instructions and:

1. Do not install anchors underneath utilities or subsurface structures.
2. Maintain horizontal clearances as required by the Engineer.
3. Install to the minimum embedment length.
4. Continuously monitor and record torque during installation. If torque at the minimum embedment length is not equal to or greater than the minimum required, continue installation to greater embedment until the minimum installation torque is achieved for 2 continuous feet.

48-6.03G(4) Removal

After service is complete, remove using reverse torque. Fill the space left behind with excavated material or sand free of deleterious materials. Place the backfill material in 4-inch thick layers. Moisten and thoroughly compact each layer.

48-6.03H Expanded Steel Plate Anchors, Cross Plate Anchors, and Expanding Rock Anchors

48-6.03H(1) General

Reserved.

Add to section 49-3.02B(6)(c):

The synthetic slurry must be one of the materials shown in the following table:

| Material | Manufacturer |
|-----------------------------|--|
| SlurryPro CDP | KB INTERNATIONAL LLC 735 BOARD ST STE 209 CHATTANOOGA TN 37402 (423) 266-6964 |
| Super Mud | PDS CO INC 105 W SHARP ST EL DORADO AR 71731 (870) 863-5707 |
| Shore Pac GCV | CETCO CONSTRUCTION DRILLING PRODUCTS 2870 FORBS AVE HOFFMAN ESTATES IL 60192 (800) 527-9948 |
| Terragel or Novagel Polymer | GEO-TECH SERVICES LLC 220 N. ZAPATA HWY STE 11A-449A LAREDO TX 78043 (210) 259-6386 |

Use synthetic slurries in compliance with the manufacturer's instructions. Synthetic slurries shown in the above table may not be appropriate for a given job site.

Synthetic slurries must comply with the Department's requirements for synthetic slurries to be included in the above table. The requirements are available from the Offices of Structure Design, P.O. Box 168041, MS# 9-4/11G, Sacramento, CA 95816-8041.

SlurryPro CDP synthetic slurry must comply with the requirements shown in the following table:

SLURRYPRO CDP

| Property | Test | Value |
|--|--|------------------------------|
| Density During drilling | Mud Weight (density), API 13B-1, section 1 | ≤ 67.0 pcf ^a |
| Before final cleaning and immediately before placing concrete | | ≤ 64.0 pcf ^a |
| Viscosity During drilling | Marsh Funnel and Cup. API 13B-1, section 2.2 | 50–120 sec/qt |
| Before final cleaning and immediately before placing concrete | | ≤ 70 sec/qt |
| pH | Glass electrode pH meter or pH paper | 6.0–11.5 |
| Sand content, percent by volume Before final cleaning and immediately before placing concrete | Sand, API 13B-1, section 5 | ≤ 0.5 percent |

^aIf authorized, you may use slurry in salt water. The allowable density of slurry in salt water may be increased by 2 pcf.

Slurry temperature must be at least 40 degrees F when tested.

Super Mud synthetic slurry must comply with the requirements shown in the following table:

SUPER MUD

| Property | Test | Value |
|---|--|-------------------------|
| Density During drilling | Mud Weight (Density), API 13B-1, section 1 | ≤ 64.0 pcf ^a |
| Before final cleaning and immediately before placing concrete | | ≤ 64.0 pcf ^a |
| Viscosity During drilling | Marsh Funnel and Cup. API 13B-1, section 2.2 | 32–60 sec/qt |
| Before final cleaning and immediately before placing concrete | | ≤ 60 sec/qt |
| pH | Glass electrode pH meter or pH paper | 8.0–10.0 |
| Sand content, percent by volume Before final cleaning and immediately before placing concrete | Sand, API 13B-1, section 5 | ≤ 0.5 percent |

^aIf authorized, you may use slurry in salt water. The allowable density of slurry in salt water may be increased by 2 pcf.

Slurry temperature must be at least 40 degrees F when tested.

Shore Pac GCV synthetic slurry must comply with the requirements shown in the following table:

SHORE PAC GCV

| Property | Test | Value |
|---|--|-------------------------|
| Density During drilling | Mud Weight (Density), API 13B-1, section 1 | ≤ 64.0 pcf ^a |
| Before final cleaning and immediately before placing concrete | | ≤ 64.0 pcf ^a |
| Viscosity During drilling | Marsh Funnel and Cup. API 13B-1, section 2.2 | 33–74 sec/qt |
| Before final cleaning and immediately before placing concrete | | ≤ 57 sec/qt |
| pH | Glass electrode pH meter or pH paper | 8.0–11.0 |
| Sand content, percent by volume Before final cleaning and immediately before placing concrete | Sand, API 13B-1, section 5 | ≤ 0.5 percent |

^aIf authorized, you may use slurry in salt water. The allowable density of slurry in salt water may be increased by 2 pcf.

Slurry temperature must be at least 40 degrees F when tested.

Replace "Reserved" in section 86-1.06B with:

Traffic Management System (TMS) elements include, but are not limited to ramp metering (RM) system, communication system, traffic monitoring stations, video image vehicle detection system (VIVDS), microwave vehicle detection system (MVDS), loop detection system, changeable message sign (CMS) system, extinguishable message sign (EMS) system, highway advisory radio (HAR) system, closed circuit television (CCTV) camera system, roadway weather information system (RWIS), visibility sensor, and fiber optic system.

Existing TMS elements, including detection systems, shown and located within the project limits must remain in place and be protected from damage. If the construction activities require existing TMS elements to be nonoperational or off line, and if temporary or portable TMS elements are not shown, the Contractor must provide for temporary or portable TMS elements. The Contractor must receive authorization on the type of temporary or portable TMS elements and installation method.

Before work is performed, the Engineer, the Contractor, and the Department's Traffic Operations Electrical representatives must jointly conduct a pre-construction operational status check of all existing TMS elements and each element's communication status with the Traffic Management Center (TMC), including existing TMS elements not shown and elements that may not be impacted by the Contractor's activities. The Department's Traffic Operations Electrical representatives will certify the TMS elements' location and status, and provide a copy of the certified list of the existing TMS elements within the project limits to the Contractor. The status list will include the operational, defined as having full functionality, and the nonoperational components.

The Contractor must obtain authorization at least 72 hours before interrupting existing TMS elements' communication with the TMC that will result in the elements being nonoperational or off line. The Contractor must notify the Engineer at least 72 hours before starting excavation activities.

Traffic monitoring stations and their associated communication systems, which were verified to be operational during the pre-construction operational status check, must remain operational on freeway/highway mainline at all times, except:

1. For a duration of up to 15 days on any continuous segment of the freeway/highway longer than 3 miles
2. For a duration of up to 60 days on any continuous segment of the freeway/highway shorter than 3 miles

If the construction activities require existing detection systems to be nonoperational or off line for a longer time period or the spacing between traffic monitoring stations is more than the specified criteria above, and temporary or portable detection operations are not shown, the Contractor must provide provisions for temporary or portable detection operations. The Contractor must receive authorization on the type of detection and installation before installing the temporary or portable detection.

If existing TMS elements shown or identified during the pre-construction operational status check, except traffic monitoring stations, are damaged or fail due to the Contractor's activity, where the elements are not fully functional, the Engineer must be notified immediately. If the Contractor is notified by the Engineer that existing TMS elements have been damaged, have failed or are not fully functional due to the Contractor's activity, the damaged or failed TMS elements, excluding structure-related elements, must be repaired or replaced, at the Contractor's expense, within 24 hours. For a structure-related elements, the Contractor must install temporary or portable TMS elements within 24 hours. For nonstructure-related TMS elements, the Engineer may authorize temporary or portable TMS elements for use during the construction activities.

The Contractor must demonstrate that repaired or replaced elements operate in a manner equal to or better than the replaced equipment. If the Contractor fails to perform required repairs or replacement work, the Department may perform the repair or replacement work and the cost will be deducted from monies due to the Contractor.

A TMS element must be considered nonoperational or off line for the duration of time that active communications with the TMC is disrupted, resulting in messages and commands not transmitted from or to the TMS element.

The Contractor must provide provisions for replacing existing TMS elements within the project limits, including detection systems, that were not identified on the plans or during the pre-construction operational status check that became damaged due to the Contractor's activities.

If the pre-construction operational status check identified existing TMS elements, then the Contractor, the Engineer, and the Department's Traffic Operations Electrical representatives must jointly conduct a post construction operational status check of all existing TMS elements and each element's communication status with the TMC. The Department's Traffic Operations Electrical representatives will certify the TMS elements' status and provide a copy of the certified list of the existing TMS elements within the project limits to the Contractor. The status list will include the operational, defined as having full functionality, and the nonoperational components. TMS elements that cease to be functional between pre and post construction status checks must be repaired at the Contractor's expense.

The Engineer will authorize the schedule for final replacement, the replacement methods and the replacement elements, including element types and installation methods before repair or replacement work is performed. The final TMS elements must be new and of equal or better quality than the existing TMS elements.

If no electrical work exists on the project and no TMS elements are identified within the project limits, the pre-construction operational status check is change order work.

Furnishing and installing temporary or portable TMS elements that are not shown, but are required when an existing TMS element becomes nonoperational or off line due to construction activities, is change order work.

Furnishing and installing temporary or portable TMS elements and replacing TMS elements that are not shown nor identified during the pre-construction operational status check and were damaged by construction activities is change order work.

If the Contractor is required to submit provisions for the replacement of TMS elements that were not identified, submitting the provisions is change order work.

Add to the 1st paragraph of section 86-1.07:

The first order of work is to install new service equipment enclosure and establish new service.

Add to section 86-2.04A:

Where the side tenon detail at the end of the signal mast arm is shown, you may substitute the applicable tip tenon detail.

The sign mounting hardware must be installed at the locations shown.

Set the Type 1 standards with the handhole on the downstream side of the pole in relation to traffic or as shown.

Add to section 86-2.05A:

Conduit installed underground must be Type 1.

Add to section 86-2.05B:

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

Add to section 86-2.05C:

If a standard coupling cannot be used for joining Type 1 conduit, use a UL-listed threaded union coupling under section 86-2.05C, a concrete-tight split coupling, or a concrete-tight set screw coupling.

If Type 3 conduit is placed in a trench, not in the pavement or under concrete sidewalk, after the bedding material is placed and the conduit is installed, backfill the trench to not less than 4 inches above the conduit with minor concrete under section 90-2, except the concrete must contain not less than 421 pounds of cementitious material per cubic yard. Backfill the remaining trench to finished grade with backfill material.

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

At those locations where conduit is required to be installed under pavement and underground facilities designated as high priority subsurface installation under Govt Code § 4216 et seq. exist, conduit must be placed by the trenching in pavement method under section 86-2.05C.

At other locations where conduit is required to be installed under pavement and if a delay to vehicles will not exceed 5 minutes, conduit may be installed by the trenching in pavement method.

Replace the 3rd paragraph in section 86-2.06A(2) of the RSS for section 86-2.06 with:

In a ground or sidewalk area, embed the bottom of a pull box in crushed rock.

Replace "Reserved" in section 86-2.06B of the RSS for section 86-2.06 with:

86-2.06B(1) General

86-2.06B(1)(a) Summary

Section 86-2.06B includes specifications for installing non-traffic-rated pull boxes.

86-2.06B(1)(b) Submittals

Before shipping pull boxes to the jobsite, submit a list of materials, Contract number, pull box manufacturer, manufacturer's instructions for pull box installation, and your contact information to METS.

Submit reports for pull box from an NRTL-accredited lab.

86-2.06B(1)(c) Quality Control and Assurance

86-2.06B(1)(c)(i) General

Pull boxes may be tested by the Department. Deliver pull boxes and covers to METS and allow 30 days for testing. When testing is complete, you will be notified. You must pick up the boxes and covers from the test site and deliver it to the job site.

Any failure of the pull box or the cover that renders the unit noncompliant with these specifications will be a cause for rejection. If the unit is rejected, you must allow 30 days for retesting. Retesting period starts when the replacement pull box is delivered to the test site. You must pay for all retesting costs. Delays resulting from the submittal of noncompliant materials does not relieve you from executing the Contract within the allotted time.

If the pull box submitted for testing does not comply with the specifications, remove the unit from the test site within 5 business days after notification that it is rejected. If the unit is not removed within that period, it may be shipped to you at your expense.

You must pay for all shipping, handling, and transportation costs related to the testing and retesting.

86-2.06B(1)(c)(ii) Functional Testing

The pull box and cover must be tested under ANSI/SCTE 77, "Specification for Underground Enclosure Integrity."

86-2.06B(1)(c)(iii) Warranty

Provide a 2-year manufacturer replacement warranty for pull box and cover from the date of installation of the pull box and cover. All warranty documentation must be submitted before installation.

Replacement parts must be provided within 5 business days after receipt of failed pull box, cover, or both at no cost to the Department and must be delivered to the Department's Maintenance Electrical Shop at San Gabriel Electrical Maintenance Yard, 9153 Lower Azusa Road, Rosemead, CA 91770, (626) 286-7849.

86-2.06B(2) Materials

The pull box and cover must comply with ANSI/SCTE 77, "Specification for Underground Enclosure Integrity," for tier 22 load rating and must be gray or brown.

Each pull box cover must have an electronic marker cast inside.

Extension for the pull box must be of the same material as the pull box and attached to the pull box to maintain the minimum combined depths as shown.

Include recesses for a hanger if a transformer or other device must be placed in a pull box.

The bolts, nuts, and washers must be a captive bolt design.

The captive bolt design must be capable of withstanding a torque range of 55 to 60 ft-lb and a minimum pull out strength of 750 lb. Perform the test with the cover in place and the bolts torqued. The pull box and cover must not be damaged while performing the test to the minimum pull out strength.

Stainless steel hardware must have an 18 percent chromium content and an 8 percent nickel content.

Galvanize ferrous metal parts under section 75-1-.05.

Manufacturer's instructions must provide guidance on:

1. Quantity and size of entries that can be made without degrading the strength of the pull box below tier 22 load rating
2. Where side entries cannot be made
3. Acceptable method to be used to create the entry

Tier 22 load rating must be labeled or stenciled by the manufacturer on the inside and outside of the pull box and on the underside of the cover.

86-2.06B(3) Construction

Do not install pull box in curb ramps or driveways.

A pull box for a post or a pole standard must be located within 5 feet of the standard. Place a pull box adjacent to the back of the curb or edge of the shoulder. If this is impractical, place the pull box in a suitable, protected, and accessible location.

For pull boxes with a tamper resistant cover adjacent to lighting standards, install a 10 A fuse inside the pull box and a 5 A fuse in the circuit in the lighting standard handhole.

Add to the RSS section 86-2.06:

86-2.06D TAMPER RESISTANT PULL BOX COVERS

86-2.06D(1) General

86-2.06D(1)(a) Summary

This work includes installing tamper resistant (TR) pull box cover jointed to security skirt, steel nuts, lock nut, cap and steel anchor rod.

86-2.06D(1)(b) Submittals

Before shipping TR cover to the job site, submit a list of materials, contract number, manufacturer's name, and manufacturer's instructions for installation.

Submit documents from NRTL that cover complies to AASHTO HS20.

Submit warranty documentation before installation.

86-2.06D(1)(c) Quality Control and Assurance

86-2.06D(1)(c)(i) Warranty

Provide a 1-year replacement warranty from the manufacturer of the TR cover against any defects or failures. The effective date of the warranty is the date of final acceptance.

Provide replacement parts within 5 business days after receipt of failed parts. The Department does not pay for replacement parts. Deliver replacement parts to the following Department's Maintenance Electrical Shop:

San Gabriel Electrical Maintenance Yard
9153 Lower Azusa Road
Rosemead, CA 91770
(626) 286-7849

86-2.06D(2) Materials

Provide the following:

1. A cover with a factory jointed 7 inch deep security skirt sized to encase the pull box. The cover must be of steel tread plate. Cover must be 1/2 inch thick minimum and of non skid surface. The security skirt must be of steel 3/8 inch thick minimum. Cover must be marked for the application as shown.
2. The L shape steel anchor rod not less than 1 inch diameter by 4 feet long for the No. 5 pull box, 1 inch diameter by 5 feet long for No. 6 pull box.
3. Steel hex nuts, lock nuts and cap.
4. Epoxy.
5. Steel plate 3/16" X 3" X 8".

TR cover and accessories must be as, or equal to those manufactured by the following companies or equal:

1. Factory Direct Fastening (FDF), 1608 A North Hillhurst Ave., Los Angeles, CA 90027. Telephone (800) 942-4844.
2. ERC, Inc, 2970 E Maria, Rancho Dominguez, CA 90221. Telephone (310) 603-2970.
3. Pendarvis Manufacturing, 1808 American St., Anaheim, CA 92801. Telephone (714) 992-0950.
4. Case Automation Corp, 5920 Rickenbacker Ave., Riverside, CA 92504. Telephone (951) 202-7088 or (951) 493-6666.

TR cover manufactured by FDF is patented and royalty payments may apply.

Stainless steel hardware must have an 18 percent chromium content and an 8 percent nickel content.

Galvanize ferrous metal parts must comply with section 75-1.05.

Epoxy to fill the lock nut socket space must conform to Loc-tite #E-120HP or Scotch-weld # DP460 or Devcon Plus25 #14278 or equivalent.

86-2.06D(3) Construction

Install TR cover as follows:

1. Dig 8 inch diameter by 5 or 6 feet deep hole and install L shape steel anchor rod, set center of the pull box to coincide with the anchor rod. Include a provision for drain hole for the pull box.
2. Install pull box over the steel anchor rod and conduits.
3. Stabilize and align the anchor rod. Ensure the anchor rod is vertical and concentric with the pull box.
4. Pour concrete around anchor rod and outside pull box. Concrete outside pull box must be 7 inch below finished grade and the skirt will rest on this concrete.
5. Bond and ground TR cover.
6. Position the TR cover to encase the pull box. Secure TR cover to steel anchor rod.
7. Add epoxy to fill the lock nut socket space.
8. Top of TR cover must flush with finished grade.

Replace the 1st paragraph of section 86-2.09E with:

Splices must be insulated by "Method B."

Delete the 6th and 7th paragraphs of section 86-2.09E.

Add to section 86-2.11A:

Each service must be provided with up to 2 main circuit breakers that will disconnect ungrounded service entrance conductors. Where the "Main" circuit breaker consists of 2 circuit breakers as described, each of the circuit breakers must have a minimum interrupting capacity of 10,000 A, rms.

Replace section 86-2.18 with:

86-2.18 NUMBERING ELECTRICAL EQUIPMENT

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

Add to section 86-3.02A(3):

Batteries must have a written warranty against defects in materials and workmanship from the manufacturer prorated for a period of 60 months after installation. You must provide the Engineer with all warranty documentation before installation. Replacement batteries must be available within 5 business days after receipt of failed batteries. The Department pays to ship the failed batteries. Replacement batteries must be delivered to Caltrans Maintenance Electrical Shop at 7316 E. Bandini Blvd., Commerce, CA 90040.

Add to section 86-3.02B:

External cabinet must be capable of housing:

1. 4 batteries
2. Inverter/charger unit
3. Power transfer relay
4. Manually-operated bypass switch
5. Required control panels
6. Wiring and harnesses

Replace the 3rd, 5th, 7th, and 9th paragraphs of section 86-3.02B with:

Dimensions and details for the external cabinet, for attaching the external cabinet to the Model 332L cabinet, and for wiring the Department-furnished equipment will be available in an *Information Handout* as specified in section 2-1.06B or as shown.

The external cabinet must be ventilated by using louvered vents, a filter, and a thermostatically controlled fan. Fan must be AC-operated from the same line output as the Model 332L cabinet. A 2-position terminal block must be provided on the fan panel along with 10 feet of connected hookup wire.

The external cabinet must include all bolts, washers, nuts, and cabinet-to-cabinet coupler fittings necessary for mounting it to the Model 332L cabinet.

External cabinet to Model 332L cabinet couplings must include a conduit for power connections between the 2 cabinets. Couplings must include:

1. 2-inch nylon-insulated steel chase nipple, T & B 1947 or equivalent
2. 2-inch sealing, steel locknut, T & B 146SL or equivalent
3. 2-inch nylon-insulated steel bushing, T & B 1227 or equivalent

Replace the 1st paragraph of section 86-3.02C with:

Mount external cabinet to either the left or right side of the Model 332L cabinet. The typical side-mounting location of the external cabinet is flush with the bottom of the Model 332L cabinet and approximately equidistant from the front and rear door edges.

Replace "Reserved" in section 86-3.02D with:

Payment for assembling and installing battery backup system is included in the payment for signal and lighting.

Add to section 86-3:

86-3.05 MODEM MODULE SYSTEM

86-3.05A General

86-3.05A(1) Summary

Section 86-3.05 includes specifications for Model 400B Modem Module and its installation in a Model 170E controller in the controller assembly.

The Department will furnish the C2P harness for modem interconnect. Comply with section 6-2.03.

The Model 400B Modem Module is used for field to field communications between the signal system master and traffic signal local controllers.

The Model 400B Modem Module must interface to a signal system master using Model 170E controller with Department Traffic Responsive Field Master (TRFM) software and communicate with Model 2070-6B modems in traffic signal local controllers.

86-3.05A(2) Definitions

CTNET: Traffic signal management and surveillance system for Model 170E controllers using AB3418/AB3418E protocol.

signal system master controller: Field master controller used to interface transportation management center and traffic signal controllers.

traffic signal controller: Local controllers used to control traffic signal intersection or pedestrian crosswalk.

TSMSS: Traffic signal management and surveillance system for Model 170E or 2070 controllers using AB3418/AB3418E or NTCIP protocols.

86-3.05A(3) Submittals

Within 30 days of contract approval, submit manufacturer's technical specification for Model 400B Modem Module.

Within 30 days of contract approval, submit 5 copies of installation and test plan for acceptance.

Submit a copy of test results for all the tests conducted for acceptance.

Submit system schematic drawings that identify type and function of all equipment at each location. The drawings must show each equipment interconnect in the system.

Submit system manuals. The system manuals must provide all of the information necessary to operate, maintain, and repair all of the equipment that you installed. Manuals must include master item index that describes the purpose of each manual and a brief description to the directory. It must also reference manufacturer equipment manuals as required for additional support material. It must contain an overall description of the system with illustrative block diagrams including associated equipment and cables. It must identify all equipment and cables in the system stating the exact module and option number employed in the system. Provide manufacturer contact information, technical data specification, parts lists, part description, and settings for every type of equipment or cable. Clearly describe any calibration, configuration, and modification done on any equipment. Manuals must record all changes to equipment manufacturer default settings. Manuals must include fault diagnostic and repair procedures to allow the location and correction of faults to the level of each replaceable module. The manual must include procedures for preventative maintenance in order to maintain the performance parameters of the system, equipment and cables according to the specifications of the manufacturer.

86-3.05A(4) Quality Control and Assurance

Prototype equipment is not acceptable. Equipment must be off the shelf, must be of current standard production units manufactured by original equipment manufacturer, and must have been in production for a minimum of 6 months. Rebuilt, modified, or reconditioned equipment is not allowed.

All equipment must work with the existing Department TRFM and traffic signal software without modification in existing software.

Test the Model 400B Modem Module. Verify 2-way communications between signal system master and all interconnected traffic signal local controllers. Verify at each traffic signal controller location that local controllers receive the AB3418E status request messages sent by the signal system master controller. Verify at the signal system master location that the signal system master controller receives AB3418E status response messages sent by all local controllers.

Perform functional tests of complete system function to demonstrate that the system satisfies the functional specifications. The connectivity of each communication link must be demonstrated including all links from local controllers to signal system masters and all communication links from signal system masters to communication devices.

86-3.05B Materials

Order equipment after acceptance of manufacturer's technical specification and certificate of compliance.

Furnish the Model 400B Modem Module.

Deliver equipment for quality assurance testing to CTNET/TSMSS Office with email D7CTNET@dot.ca.gov and located at Mail Stop 15, CTNET/TSMSS Traffic Signals Branch, California Department of Transportation, Office of Intelligent Transportation Systems, 100 South Main Street, Room 04-031 (Signal Lab), Los Angeles, CA 90012. Notify the Engineer of the delivery. Include in the notification the date and a description of equipment.

Pick up the equipment and quality assurance test results from the CTNET/TSMSS Office after the Engineer notifies you or 30 days after you deliver the equipment. Notify the Engineer of the pickup. Include in the notification the date and description of equipment.

The Model 400B modem module must comply with the specifications for Model 400B Modem Module specified in chapter 2, section 3, "Model 400, 400B, and 400BE Modem Module," of the TEES, and must support 9600 baud rate communications with Model 2070-6B modems.

Install the equipment after quality assurance testing and acceptance of the installation and test plan.

86-3.05C Construction

Notify the Engineer at least 3 business days prior to system installation.

Comply with the manufacturer's recommendations. Model 400B Modem Modules must be installed in modem slot 1 of Model 170E controllers and connected to terminal block TB0 using port C2S in controller and Department-furnished C2P modem interconnect harness.

Signal system master and traffic signal controllers must be interconnected as follows:

| TB-0 Terminal Block Connector | TB-0 terminal Block SIC Typical Color | Traffic Signal Controller | | Signal System Master Controller | |
|-------------------------------|---------------------------------------|---------------------------|--------------|---------------------------------|--------------|
| | | C2S Port Function | C2S Port Pin | C2S Port Function | C2S Port pin |
| A1 | White | Audio IN | A | -- | -- |
| A2 | Blue | Audio IN | B | -- | -- |
| A3 | White | Audio OUT | C | -- | -- |
| A4 | Orange | Audio OUT | E | -- | -- |
| A1 | White | -- | -- | Audio OUT | C |
| A2 | Blue | -- | -- | Audio OUT | E |
| A3 | White | -- | -- | Audio IN | A |
| A4 | Orange | -- | -- | Audio IN | B |

Equipment installation must not affect the normal activity of the controller cabinet's doors. Use cable ties, wire mounting devices, nonmetallic cable strain relief, and fixed diameter clamps in the controller cabinet and equipment rack. Use wire management brackets every 2 feet in the cabinets to route cable. Use cables and wire management system components to avoid physical interference between cables and adjacent equipment, to allow equipment to be removed from cabinets without physical interference, and to keep terminal blocks clearly visible.

86-3.05D Payment

Not Used

Add to section 86-3:

86-3.06 GPS TIME BASE SYSTEM

86-3.06A General

86-3.06A(1) Summary

Section 86-3.06 includes specifications for Global Positioning System (GPS) time source device and its installation in the controller assembly.

The GPS time source device must interface to a signal system master using Model 170E controller with Department Traffic Responsive Field Master (TRFM) software.

86-3.06A(2) Definitions

DB-9 connector: Also known as DB-9 connector, 9 pin D subminiature E size shell connector, for TIA-232 applications.

86-3.06A(3) Submittals

Within 30 days of contract approval, submit manufacturer's technical specifications for GPS time base system.

Within 30 days of contract approval, submit 5 copies of installation and test plan for acceptance.

Submit a copy of manufacturer test results and for all the tests conducted for acceptance.

Submit system schematic drawings that identify type and function of all equipment at each location. The drawings must also show how each equipment in the system is interconnected.

Submit GPS time source device user's manual.

Submit warranty documentation before installing GPS time base system.

86-3.06A(4) Quality Control and Assurance

Prototype equipment is not acceptable. Equipment must be off the shelf, must be of current standard production units manufactured by original equipment manufacturer, and must have been in production for a minimum of 6 months. Rebuilt, modified, or reconditioned equipment is not allowed.

All equipment must work with the existing Department traffic signal software without modification in existing software.

Test GPS time source device and verify that it updates the year, month, day in month, day of week, hour, minutes and seconds on the signal system master controller every 60 seconds.

86-3.06A(4)(a) Warranty

Furnish a 2-year replacement warranty from the manufacturer of the GPS time base system against any defects or failures. The effective date of the warranty is the date of acceptance of the installation. Furnish replacement parts within 10 days after receipt of the failed parts. The Department does not pay for the replacement. Deliver replacement parts to the following Department Maintenance Electrical Shop:

San Gabriel Electrical Maintenance Yard
9153 Lower Azusa Road
Rosemead, CA 91770

86-3.06A(4)(b) Functional Testing

Field tests must be completed for acceptance. Notify the Engineer 15 days before testing the GPS time base system.

86-3.06B Materials

Order equipment after acceptance of manufacturer's technical specification and furnish certificate of compliance.

Furnish the GPS Time Source Device.

Equipment must comply with the TEES and the following:

1. GPS time source device: The device must be designed for use with Model 170E controllers and must include an industrial grade cable with a DB-9 socket connector and a C2 plug to connect the device's DB-9 port to port C40S of a Model 170E controller for serial data communications and power. The device must include user's manual containing full description of ASCII time code formats, reporting protocols, set and query commands, and configurable settings. The device must support serial communications with the existing traffic signal controller hardware and software without modification. The GPS time source device must connect to the wireless modem antenna and include a SMA receptacle to BNC plug straight adapter.

2. GPS time source device for must be stand alone. The device must use a GPS receiver to get time from GPS satellites and provide accurate time to traffic controllers. The device must have a maximum drift of 0.3 second per day when the GPS signal is lost, must have a rechargeable super capacitor for back-up power of the real time clock and memory for up to 24 hours during power outages. The device must support command and response messages for user queries and for configurable settings via serial communications interface used to establish communications with controller unit. The device must comply with the GPS receiver, default configurations, QS command set, data output, protocols, LED indicators, GPS tracking, and environmental requirements specified in TEES, errata 1, chapter 10, section 9, "MODEL 2070-7G UNIVERSAL TIME BASE MODULE." The GPS time source device for Model 170E controllers must comply with the following:

| | |
|---|---|
| Serial Interface GPS Time Source Requirements | Serial Interface: TIA-232, from 300 to 19,200 bps Serial Interface Time Source: Data Accuracy \pm 10 milliseconds adjusted to compensate for data transmission according to data rate setting. |
| Power Requirements | DB-9 pin 9 for power input from Model 170E Traffic Controller C2 socket connector. DB-9 pin 9 Input Voltage: +5 V(dc) regulated DB-9 pin 9 Input Current: 200 mA at +5 V(dc) Optional input Voltage: 24 V(dc) unregulated |
| GPS Requirements | Satellite Tracking: Minimum 1 satellite tracking for time and 4 satellites tracking for location. Track up to 8 satellites simultaneously Receiver Frequency: 1575.42 MHz |
| Mechanical Requirements | Serial Port: DCE DB-9 plug connector. GPS Connector: SMA receptacle or 50 Ohm BNC socket connector with SMA receptacle to BNC plug straight adapter. Dimensions: Maximum combined length, width, and height: 12 inches, 2 mounting flanges with 2 keyhole screw mounts Optional power connector with AC adaptor. |

Install the equipment after quality assurance testing approval of the installation and test plan.

86-3.06C Construction

Follow the manufacturer's recommendations for installation. GPS time source device must be mounted, connected to port C40S of Model 170E controller used as signal system master, and connected to SMA connector of wireless modem antenna specified in section 86-3.06.

Equipment installation must not affect the normal operation of the controller cabinet's doors. Use cable ties, wire mounting devices, non-metallic cable strain relief, and fixed diameter clamps in the controller cabinet and equipment rack. You must use wire management brackets every 2 feet in the cabinets to route cable. You must use cables and wire management system components to avoid physical interference between cables and adjacent equipment, to allow equipment to be removed from cabinets without physical interference, and to keep terminal blocks clearly visible.

The device must be connected to the wireless modem antenna's SMA plug straight connector. The SMA receptacle to BNC plug straight adapter included with the antenna must be used if the device has a BNC receptacle connector. A stand alone GPS time source device's status LEDs must face upward, and must be mounted on the controller cabinet's rack at the same side as terminal block TB0 and close to the top of the rack and to the back of the cabinet.

86-3.06D Payment

Not Used

Add to section 86-3:

86-3.07 WIRELESS DATA SERVICE SYSTEM

86-3.07A General

86-3.07A(1) Summary

Section 86-3.07 includes specifications for wireless data service system materials and their installation in the controller assembly.

The wireless data service system is used for center to field communications and must interface to a signal system master using Model 170E controller with Department Traffic Responsive Field Master (TRFM) software and to CTNET or TSMSS.

86-3.07A(2) Definitions

CTNET: Traffic signal management and surveillance system for Model 170E controllers using AB3418/AB3418E protocol.

signal system master controller: Field master controller used to interface transportation management center with traffic signal controllers.

traffic signal controller: Local controllers used to control traffic signal intersection or pedestrian crosswalk.

TSMSS: Traffic signal management and surveillance system for Model 170E or 2070 controllers using AB3418/AB3418E or NTCIP protocols.

DE-9 connector: Also known as DB-9 connector, 9 pin D subminiature E size shell connector, for EIA/TIA-232 applications.

86-3.07A(3) Submittals

Submit list of equipment and manufacturer's technical specifications for acceptance within 30 days.

Submit 5 copies of installation and test plan for acceptance within 30 days.

Submit a copy of manufacturer test results and for all the tests conducted.

Submit system schematic drawings that identify type and function of all equipment at each location. The drawings must also show how each equipment in the system is interconnected.

Submit system manuals. The system manuals must provide all of the information necessary to operate, maintain, and repair all of the equipment that you installed. Manuals must include master item index that describes the purpose of each manual and a brief description to the directory. It must also reference manufacturer equipment manuals as required for additional support material. It must contain an overall description of the system with illustrative block diagrams including associated equipment and cables. It must identify all equipment and cables in the system stating the exact module and option number employed in the system. Provide manufacturer contact information, technical data specification, parts lists, part description, and settings for every type of equipment or cable. Clearly describe any calibration, configuration, and modification done on any equipment. Manuals must record all changes to equipment manufacturer default settings. Manuals must include fault diagnostic and repair procedures to allow the location and correction of faults to the level of each replaceable module. The manual must include procedures for preventative maintenance in order to maintain the performance parameters of the system, equipment and cables according to the specifications of the manufacturer.

Submit warranty documentation before installing wireless data service system.

86-3.07A(4) Quality Control and Assurance

Arrange to have licensed technicians, qualified to install, work and test the system, present at the time the system is turned on.

Prototype equipment is not acceptable. Equipment must be off the shelf, must be of current standard production units manufactured by original equipment manufacturer, and must have been in production for a minimum of 6 months. Rebuilt, modified, or reconditioned equipment is not allowed.

All equipment must work with the existing CTNET/TSMSS and Department traffic signal software without modification in existing software.

86-3.07A(4)(a) System Testing

Pick up the quality assurance test results from the CTNET/TSMSS Office.

Replace equipment that fails quality assurance testing within 7 days after the Engineer notifies you. Resubmit technical specifications and replace non-compliant equipment within 10 days after the Engineer notifies you.

Test the equipment after installation in the presence of the Engineer. Verify at each traffic signal controller location that local controllers receive the AB3418 and AB3418E status request messages sent by the signal system master controller. Verify at each signal system master location that the signal system master controller receives AB3418 and AB3418E status response messages sent by local controllers. Verify that an existing CTNET/TSMSS computer at the LARTMC or CTNET/TSMSS Office receives AB3418 and AB3418E status response messages from each of the local controllers.

Notify Engineer and CTNET/TSMSS Office after system testing, and provide location type, route name, county, route, and post mile for each location tested.

System testing must include test plan, pre-installation testing, acceptance testing, and final acceptance.

86-3.07A(4)(a)(i) Test Plan

Develop and submit installation and test plan. The test plan must detail the method of installation and testing for each equipment in the system, and the associated schedule of activities. The test plan must comply with the manufacturer's recommended test procedures and industry standard practices.

86-3.07A(4)(a)(ii) Pre-installation Testing

Test all equipment and components prior to installation of the system, and record test results.

Perform a physical inspection of all equipment for quality of workmanship free of manufacturing defects and provide documentation to prove delivery of equipment.

86-3.07A(4)(a)(iii) Acceptance Testing

The acceptance testing must comply with the accepted test plan. The acceptance testing must include conducting acceptance tests and subsequent retests, and documentation of the test results.

Perform functional tests of complete system functions to demonstrate that the system satisfies the functional specifications. The connectivity of each communication link must be demonstrated including all links from local controllers to signal system masters, all communication links from signal system masters to communication devices, and all communication links from signal system master controllers to the LARTMC or CTNET/TSMSS Office.

Record all functional test results. Submit documentation for review and acceptance, no later than 10 days after completion of the acceptance tests and incorporate all comments made during the acceptance stage.

If any aspect of the functional tests violates the specifications, cease all acceptance testing, determine the cause of the failure, modify connections and replace equipment. Acceptance testing must be repeated from the start of functional tests. You are responsible for delay caused by replacement of equipment that violates the specifications.

86-3.07A(4)(a)(iv) Final Acceptance

Final acceptance will occur after compliance with the following:

1. All test results have been accepted
2. System manuals have been accepted
3. All connections that were changed to perform tests have been restored and tested

86-3.07A(4)(b) Warranty

Furnish a 2-year replacement warranty from the manufacturer of the wireless data service system against any defects or failures. The effective date of the warranty is the date of acceptance of the installation. Furnish replacement parts within 10 days after receipt of the failed parts. The Department does not pay for the replacement. Deliver replacement parts to the following department maintenance electrical shop:

San Gabriel Electrical Maintenance Yard
9153 Lower Azusa Road
Rosemead, CA 91770

86-3.07B Materials

Order equipment after acceptance of the equipment list and manufacturer's technical specifications.

Furnish the following equipment for wireless data service system:

1. Wireless modem device
2. Wireless modem AC adaptor
3. Wireless modem antenna
4. Wireless modem serial cable
5. Wireless modem mounting hardware
6. Wireless modem software tool

Equipment must comply with the latest TEES and the following:

1. Wireless modem device: The device must be rugged, have a 5 year memory battery backup, have a Subscriber Identity Module (SIM) Card slot, have dedicated light emitting diodes (LEDs) for status of network registration and functionality, support over-the-air remote configuration and programmable firmware updates, and reduce radio frequency (RF) transmit output power when near a base station. Wireless modem device must support TCP and UDP packet assembly/disassembly (PAD) of serial data frames and its activity must be transparent to existing CTNET/TSMSS and traffic signal software communications without requiring software modification. The wireless modem device must support circuit switched data network communications, and security configuration settings to allow access by IP address. Mount the wireless modem device using wireless modem mounting hardware. The status LEDs on the front panel must face upward. The wireless modem device must be compatible with the existing wireless data services used for other traffic signals, and must support TCP point-to-point communications with the existing CTNET/TSMSS CommServer hardware and software without modification. Wireless modem device must comply with the following:

| | |
|---------------------------|--|
| Electrical Requirement | Input Voltage: From 9 to 28 V(dc) |
| | Input Current: From 20 to 450 mA |
| | Maximum Idle/Transmit/Receive Load requirements: 414 mA at 12 V(dc) |
| | Transmit Power: 1.0 W at 1900 MHz, and 0.8 W at 850 MHz |
| Network/Interface | Serial Interface: TIA-232, from 300 to 115,200 bps Serial Port: DCE DE-9 socket |
| | Ethernet Interface: 10 Mbps 10-BASET and 100 Mbps 100-BASET Ethernet: modular receptacle |
| | Application Interfaces: TCP/IP, UDP/IP, Hypertext Transfer Protocol (HTTP), Telecommunications Network (Telnet), Short Message Service (SMS) |
| | Network: Multiple Band 850/1900 MHz HSUPA with Fallback to HSDPA, UMTS, EDGE, and GPRS (MS-12), and GSM. |
| | Power: multiple pin connector |
| RF Requirement | Transmit Frequency Bands: From 1850 to 1910 MHz, and from 824 to 849 MHz |
| | Receiver Frequency Bands: From 1930 to 1990 MHz and from 869 to 894 MHz |
| | Receiver Sensitivity: -107 dBm typical (2.439 percent BER) |
| | Primary RF Antenna Connector: 50-Ohm SMA |
| Environmental Requirement | Operating Temperature: -22 to +158 °F Humidity: From 5 to 95 percent noncondensing |
| Mechanical Requirement | Maximum Device Size: 13 inches perimeter Integrated mounting including either 4 keyhole screw mounts or mounting bracket |

2. Wireless modem AC adaptor: The adaptor must be UL Listed Class 2 power unit, support a 120 V(ac) at 60 Hz input, have a power connector plug that connects to and fits the power receptacle in the wireless modem device, have plug for 120 V(ac) 15R receptacle, and provide a 12 V(dc) at 800 mA output.

3. Wireless modem antenna: The antenna must include a SMA receptacle to BNC plug low loss straight adapter. The antenna external surface must be Grey Color no. 36375 of Federal Standard 595B or be White coated with non-metallic polymer coating of the Grey color specified, be quad-band and quad-mode cellular/PCS/LTE radio (all carriers) with global positioning system (GPS), have a low profile design for outdoor surface mount on aluminum, stainless steel and cold rolled steel metallic surfaces, and be a weatherproof polycarbonate or polypropylene radome.

Wireless modem antenna must comply with the following:

| | |
|------------------------------|---|
| Electrical Requirement | Maximum Power Input: 10 W or more |
| | RF Nominal Input Impedance: 50-Ohm |
| | GPS Output Impedance: 50-Ohm |
| Cellular/PCS/LTE Requirement | PCS Frequency Range: From 1850 to 1990 MHz |
| | Cellular Frequency Range: From 824 to 894 MHz |
| | LTE Frequency range: From 704 to 787 MHz |
| | Radiation Pattern: Omnidirectional |
| | Minimum Gain: Unity |
| | Noise Figure: 2.0 dB maximum |
| | VSWR: 2:1 maximum over frequency range |
| GPS Requirement | GPS Axial Ratio: 3.0 dB maximum |
| | GPS Gain: 27 with 5 dBi antenna gain |
| | Radiation Pattern: Omnidirectional |
| | GPS Center frequency: 1575.42 MHz |
| | Noise Figure: 2.0 dB maximum |
| | VSWR: 2:1 maximum over frequency range |
| | Polarization: Right Hand Circular Polarization |
| | Voltages: 3.3 Volts and 5 Volts |
| Bandwidth: 2 MHz minimum | |
| Environmental Requirement | Operating Temperature: -22 to +158 °F |
| | Humidity: From 5 to 95 percent noncondensing |
| Mechanical Requirement | Maximum Height: 2 inches, Maximum Diameter: 7 inches |
| | Radio Cable and Connector: 15 feet RG-195 with SMA Plug Connector |
| | GPS Cable and Connector: 15 feet RG-174/U cable with SMA Plug Straight Connector, and SMA Socket to BNC Plug low loss Adapter |
| | Threaded lug and weatherproof watertight bolt mount including mounting hardware, locknut, foam pad and sealing gasket. |

4. Wireless modem serial cable: The cable must be 4 twisted pair no. 24 AWG stranded tinned copper with polyethylene insulation, color coded, low capacitance computer communications (CM) cable for use in TIA-232 applications. The cable must comply with UL-1581 test requirements. The core must be covered with an overall aluminum-polyester foil tape for 100 percent shield coverage, and with an outer chrome PVC jacket. The cable must have stranded tinned copper drain wire, have an operating temperature range of -22 to +176 degrees F and its nominal impedance must be 100 Ohm. The serial cable must be 12 feet in length, must have a C2 plug connector with 6 pins to connect to Model 170E and Model 2070 controllers, must have a DE-9 plug connector to connect to a modem device, must not establish contact between modem and controller chassis, and must use the wiring shown in the table below:

| C2 Plug Connector | | Wiring | Modem (DCE) TIA-232 Signal | DE-9 plug |
|--------------------|-----|-----------------|----------------------------|-----------|
| DTE TIA-232 Signal | Pin | | | Pin |
| RD | L | Connected | RD | 2 |
| TD | K | Connected | TD | 3 |
| RTS | J | Connected | RTS | 7 |
| CTS | M | Connected | CTS | 8 |
| DC GND | N | Connected | Signal GND | 5 |
| DCD | H | Connected | DCD | 1 |
| -- | -- | Jumpered to DSR | DTR | 4 |
| -- | -- | Jumpered to DTR | DSR | 6 |

5. Wireless modem mounting hardware: The mounting hardware must include 4 self-tapping screws and washers that match the keyhole screw mounts or mounting bracket of the wireless modem device.
6. Wireless modem software tool: The software tool must include user's manual, multiple site license, and software tools on compact discs at no additional cost. The wireless software tool must access wireless modem devices in the field from the LARTMC or the CTNET/TSMSS Office. The wireless modem software tool must support local and remote configuration, firmware upgrades, diagnostics, monitoring of signal level at receiver, and reset of the wireless modem device. The user's manual and system manual must describe the function of all configuration parameters accessed by the wireless modem software, describe default values, and provide valid range or values for all configuration settings.

Deliver equipment for quality assurance testing to CTNET/TSMSS Office with email D7CTNET@dot.ca.gov and located at Mail Stop 15, CTNET/TSMSS Traffic Signals Branch, California Department of Transportation, Office of Intelligent Transportation Systems, 100 South Main Street, Room 04-031 (Signal Lab), Los Angeles, CA 90012. Notify the Engineer of the delivery. Include in the notification the date and a list of equipment.

Pick up the equipment and quality assurance test results from the CTNET/TSMSS Office after the Engineer notifies you or 30 days after you deliver the equipment. Notify the Engineer of the pickup. Include in the notification the date and a list of equipment.

Install the equipment after quality assurance testing and acceptance of the installation and test plan.

Notify the Engineer at least 3 business days prior to system installation.

86-3.07C Construction

Comply with the manufacturer's. Wireless modem device must be mounted, connected to port C20S of Model 170E controller used as signal system master, and connected to SMA connector of wireless modem antenna. Wireless modem antenna must be surface mounted, and connected to GPS time source

device specified in section 86-3.05 and wireless modem device. Wireless modem AC adaptor must be connected to equipment outlet, not controller outlet, and to wireless modem device.

Equipment installation must not affect the normal activity of the controller cabinet's doors. Use cable ties, wire mounting devices, nonmetallic cable strain relief, and fixed diameter clamps in the controller cabinet and equipment rack. Use wire management brackets every 2 feet in the cabinets to route cable. Use cables and wire management system components to avoid physical interference between cables and adjacent equipment, to allow equipment to be removed from cabinets without physical interference, and to keep terminal blocks clearly visible.

Use the wireless modem device to measure signal strength. Before antenna is permanently installed, conduct signal strength measurements and submit a copy of the signal strength measurements report for acceptance of the antenna to be installed. After acceptance, install the wireless modem, connect it to the antenna, measure the radio signal strength in dBm with the cabinet doors and panels closed, and verify that the radio signal exceeds the signal strength specifications. If the antenna does not comply with the signal strength specifications, verify that the wireless modem device falls back to EDGE or GPRS. Use a serial cable, a laptop computer, and the wireless modem software tool to measure the signal strength. Antenna installation must be weatherproof and watertight. The center of the antenna must be placed at the same distance from the sides and a maximum of 5 inches from the back of the controller cabinet. Seal the cabinet after you install antenna and use specified sealant inside the cabinet on antenna hole.

Sealant must be UL listed heat resistant, weatherproof, waterproof, watertight and high temperature silicone sealant, withstand -45 to +350 degrees F when cured, withstand +10 to +100 degrees F before drying, and resist vibration. Water deflection assemblies must not be damaged and must be re-installed if removed during the installation of the wireless modem antenna. The installation of the wireless modem antenna must comply with the manufacturer's recommendations and include sealing gasket and tight locknut torque. Conduct signal strength measurements after installation and submit a copy of the report for acceptance. Replace the antenna if it does not comply with the following signal strength specifications: the signal strength measurements must exceed -90 dBm and the wireless modem device receiver sensitivity by 17 dB or more.

The mounting hardware must secure in place the wireless modem device to a mounting plate. Mounting screws must not touch the cabinet walls.

86-3.07D Payment

Not Used

Replace section 86-4.01D(1)(c)(ii) with:

86-4.01D(1)(c)(ii) Warranty

You must provide a manufacturer's written warranty against defects in materials and workmanship for LED signal modules for a minimum period of 48 months after installation of LED signal modules. Replacement LED signal modules must be provided within 15 days after receipt of failed LED modules at your expense. The Department pays for shipping the failed modules to you. All warranty documentation must be submitted to the Engineer before installation. Replacement LED signal modules must be delivered to Department's Maintenance Electrical Shop at San Gabriel Electrical Maintenance Yard at 9153 Lower Azusa Road, Rosemead, CA 91770.

Add to section 86-4.01D(2)(a):

LED signal module must be manufactured for 12-inch circular sections.

Replace section 86-4.03I(1)(c)(ii) with:

86-4.03I(1)(c)(ii) Warranty

You must provide a manufacturer's written warranty against defects in materials and workmanship for LED countdown PSF modules for a minimum period of 48 months after installation of LED countdown PSF modules. Replacement LED countdown PSF modules must be provided within 15 days after receipt of failed LED countdown PSF modules at your expense. The Department pays for shipping the failed modules to you. All warranty documentation must be submitted to the Engineer before installation. Replacement LED countdown PSF modules must be delivered to Department's Maintenance Electrical Shop at 9153 Lower Azusa Road, Rosemead, CA 91770.

Add to section 86-4.03I(2):

Installation of the LED countdown PSF module into the pedestrian signal face only requires the removal of lenses, reflectors, lamps, and existing LED modules.

Add to section 86-4.03J:

The "Meter On" sign must be a Type A pedestrian signal modified so the reflector is a single chamber with 2 incandescent lamps.

Replace section 86-4.03K with:

86-4.03K LIGHTING EMITTING DIODE COUNTDOWN PEDESTRIAN SIGNAL FACE MODULES

86-4.03K(1) General

86-4.03K(1)(a) Summary

Section 86-4.03K includes specifications for installing LED countdown PSF module into a standard Type A pedestrian signal housing. Comply with TEES.

86-4.03K(1)(b) Submittals

Before shipping to the job site, submit all LED countdown PSF modules with the following to METS:

1. Delivery form including Contract number and contact information
2. List containing all LED countdown PSF module serial nos.
3. Installation manual and schematic wiring diagram
4. Manufacturer's name, trademark, model no., lot number, and month and year of manufacture

Submit documentation of a production QA performed by the manufacturer that ensures the LED countdown PSF modules comply with the section 86-4.03 specifications. Submit documentation as an informational submittal. The documentation must include test data verifying the modules comply with the following requirements:

1. Luminous intensity as shown in the table titled "Luminance Values"
2. Power factor after burn-in
3. Test current flow measurements in amperes after burn-in. The measured values must comply with the design qualification figures. Record the measured ampere values with rated voltage on the product labels.

Submit warranty documentation as an informational submittal before installing LED countdown PSF modules.

86-4.03K(1)(c) Quality Control and Assurance

86-4.03K(1)(c)(i) General

If the Engineer determines by visual inspection that there is exterior physical damage, assembly anomalies, scratches, abrasions, cracks, chips, discoloration, or other defects to the surface of the lens, the module will be rejected.

The Department tests LED countdown PSF modules under ANSI/ASQ Z1.4 and California Test 606. The module submitted for testing must be representative of typical production units. All parameters specified in section 86-4.03K specifications may be tested on the module.

Comply with section 86-2.14A.

86-4.03K(c)(ii) Warranty

Furnish a 5-year replacement warranty from the manufacturer of the LED countdown PSF module against any defects or failures. The effective date of the warranty is the date of acceptance of the installation. Furnish replacement parts within 15 days after receipt of the failed parts. The Department does not pay for the replacement. Deliver replacement parts to the following department maintenance electrical shop:

San Gabriel Electrical Maintenance Yard
9153 Lower Azusa Road
Rosemead, CA 91770

86-4.03K(2) Materials

86-4.03K(2)(a) General

All LED countdown PSF module must be from the same manufacturer.

LED countdown PSF module must:

1. Be installed in a standard Type A pedestrian signal housing
2. Use LED as the light source
3. Be designed to mount behind or to replace face plates of a standard Type A housing as specified in ITE publication, Equipment and Material Standards, chapter 3, "Pedestrian Traffic Control Signal Indications" and the *California MUTCD*
4. Have a minimum power consumption of 10 W for the "upraised hand"
5. Use the required color and be ultra-bright type rated for 100,000 hours of continuous operation for a temperature range of -40 to +74 degrees C
6. Be able to replace the signal lamp optical units
7. Fit into a pedestrian signal section housing without modifications
8. Be a single, self-contained device, not requiring on-site assembly for installation
9. Have the following information permanently marked on the back of the module:
 - 9.1. Manufacturer's name
 - 9.2. Trademark
 - 9.3. Model no.
 - 9.4. Serial no.
 - 9.5. Lot number
 - 9.6. Month and year of manufacture
 - 9.7. Required operating characteristics, including:
 - 9.7.1. Rated voltage
 - 9.7.2. Power consumption
 - 9.7.3. Volt-ampere (VA)
 - 9.7.4. Power factor
10. Have prominent and permanent vertical markings for accurate indexing and orientation within the signal housing if a specific mounting orientation is required. Markings must include an up arrow, or the word "up" or "top." Marking must be a minimum of 1-inch diameter

The circuit board and the power supply must be contained inside of the LED countdown PSF module. The circuit board must comply with chapter 1, section 6 of TEES.

The individual LEDs must be wired such that a catastrophic loss or a failure of 1 LED does not result in the loss of:

1. More than 5 percent of the luminous output of the PSF module
2. Entire string of LEDs or the indication

The LEDs must be evenly distributed in each indication. Do not use outline shape.

No special tools for the installation are allowed.

The assembly and manufacturing process for the LED countdown PSF module must be designed to ensure internal components are adequately supported to withstand mechanical shock and vibration from high winds and other sources.

Material used for the LED countdown PSF module must comply with ASTM D 3935.

The enclosure containing the power supply or the electronic components of the LED countdown PSF module, except the lens, must be made of UL94VO flame-retardant material.

Each symbol must not be less than 9 inches high and 5.25 inches wide. The uniformity of the signal output across the emitting section of the module lens for the "walking person" and "upraised hand" symbols and the countdown display must not exceed a ratio of 5 to 1 between the highest and lowest luminance values. The symbols must comply with ITE publication, Equipment and Material Standards, chapter 3, "Pedestrian Traffic Control Signal Indications," and the *California MUTCD*.

The LED countdown PSF module must be designed to operate over the specified ambient temperature and voltage range and be readable both day and night at all distances up to the full width of the area to be crossed.

The LED countdown PSF module must maintain an average luminance value for over 60 months of continuous use in signal operation for a temperature range of -40 to +74 degrees C. In addition, upon initial testing at 25 degrees C, the LED countdown PSF module must have at least the luminance values shown in the following table:

| Luminance Values | |
|---|-----------|
| PSF module | Luminance |
| "Upraised hand" and 2-digit countdown timer | 1,094 FL |
| "Walking person" | 1,547 FL |

The color output of LED countdown PSF module must comply with the chromaticity requirements in section 5.3 of ITE publication, Equipment and Material Standards, chapter 3, "Pedestrian Traffic Control Signal Indications."

When operating over a temperature range of -40 to +74 degrees C, the measured chromaticity coordinates of the LED countdown PSF module must comply with the following chromaticity requirements for 60 months:

| Chromaticity Standards (CIE Chart) | |
|--|--|
| "Upraised hand" and 2-digit countdown timer (portland orange) | Y: not greater than 0.390 nor less than 0.331 nor less than 0.997-X |
| "Walking person" (lunar white) | X: not less than 0.280 nor greater than 0.320 Y: not less than 1.055*X - 0.0128 nor greater than 1.055*X + 0.0072 |

The LED countdown PSF module must not exceed the power consumption requirements shown in the following table:

| Maximum Power Consumption Requirements | | |
|---|----------|----------|
| PSF module display | at 24 °C | at 74 °C |
| "Upraised hand" | 10.0 W | 12.0 W |
| "Walking person" | 9.0 W | 12.0 W |
| 2-digit countdown timer | 6.0 W | 8.0 W |

The wiring and terminal block must comply with section 13.02 of ITE publication, Equipment and Material Standards, chapter 2, "Vehicle Traffic Control Signal Heads." The LED countdown PSF module must be supplied with spade lugs and 3 secured, color-coded, 3-foot long, 600 V(ac), 20 AWG minimum stranded jacketed copper wires. Wires must comply with NEC, rated for service at +105 degrees C.

The LED countdown PSF module must operate:

1. At a frequency of 60 ± 3 Hz over a voltage range from 95 to 135 V(ac) without perceptible flicker to the unaided eye. Fluctuations of the line voltage must have no visible effect on the luminous intensity of the indications. The rated voltage for measurements must be 120 V(ac).
2. Compatible with currently-used Department controller assemblies including solid-state load switches, flashers, and conflict monitors. Comply with TEES chapters 3 and 6. If a 20 mA alternating current or less is applied to the unit, the voltage read across the 2 leads must be 15 V(ac) or less.
3. With a "smart" control and regulation module that exhibits countdown displays automatically adjusted to the traffic controller programmed intervals.

The mode of operation of the countdown PSF module must be during the pedestrian change interval. The module will begin counting down when the flashing "upraised hand" interval turns on, counting down to "0," and turn off when the steady "upraised hand" interval turns on.

The LED countdown PSF module on-board circuitry must:

1. Include voltage surge protection to withstand high-repetition noise transients. The voltage surge protection must comply with NEMA Standard TS2, section 2.1.6
2. Comply with the Class A emission limits provided in 47 CFR 15, subpart B concerning the emission of electronic noise

The LED countdown PSF module must provide a power factor of 0.90 or greater.

The total harmonic distortion from a current and a voltage induced into an alternating current power line by an LED countdown PSF module must not exceed 20 percent at an operating temperature of 25 degrees C.

The LED countdown PSF module circuitry must prevent perceptible light emission to the unaided eye when a voltage, 50 V(ac) or less is applied to the unit.

When power is applied to the LED countdown PSF module, light emission must occur within 90 ms.

The "upraised hand" and "walking person" symbol indications must be electrically isolated from each other. Sharing a power supply or interconnect circuitry between the 3 indications is not allowed.

86-4.03K(3) Construction

Not Used

86-4.03K(4) Payment

Not Used

Add to section 86-5.01A(1):

Loop wire must be Type 2.

Loop detector lead-in cable must be Type B.

Slots must be filled with hot-melt rubberized asphalt sealant.

For Type E detector loops, sides of the slot must be vertical and the minimum radius of the slot entering and leaving the circular part of the loop must be 1-1/2 inches. Slot width must be a maximum of 5/8 inch. Loop wire for circular loops must be Type 2. Slots of circular loops must be filled with hot-melt rubberized asphalt sealant.

The depth of the loop sealant above the top of the uppermost loop wire in the sawed slots must be 2 inches, minimum.

Replace section 86-5.03 with:

86-5.03 ACCESSIBLE PEDESTRIAN SIGNALS

86-5.03A General

86-5.03A(1) Summary

Section 86-5.03 includes specifications for installing accessible pedestrian signal (APS). Comply with TEES.

86-5.03A(2) Definitions

APS: As defined in the *California MUTCD*.

accessible walk indication: Activated audible and vibrotactile action during the walk interval.

ambient sound: Background sound level in dB at a given location.

ambient sound sensing microphone: Microphone that measures the ambient sound level in dB and automatically adjusts the APS speaker's volume, accordingly.

APS pedestrian push button (APS PPB) assembly: Assembly that must include a PPB to actuate the APS components.

audible speech walk message: Audible prerecorded message that communicates to pedestrians which street has the walk interval.

programming mechanism: Device to program the APS operation.

push button information message: Audible prerecorded message actuated when the push button is pressed and the walk interval is not timing.

push button locator tone: As defined in the *California MUTCD*.

vibrotactile pedestrian device: As defined in the *California MUTCD*.

86-5.03A(3) Submittals

Submit the APS wiring diagram and product data.

Submit 2 APS user and operator manuals for each signalized location as an informational submittal. Each manual must include a master item index that describes the purpose and a brief description to the directory. The index must include an overall description of the APS and its associated equipment and cables with illustrative block diagrams, manufacturer contact information, technical data specification, a parts list, part descriptions, and settings. The manuals must include fault diagnostic and repair procedures and procedures for preventative maintenance in order to maintain APS performance parameters.

Before shipping to the job site, submit all APSs with the following to METS:

1. Delivery form including Contract number and contact information
2. List containing all APS serial nos.
3. Manufacturer's name, trademark, model no., lot number, and month and year of manufacture
4. Programming mechanism if not integral to the APS

Submit a record of completed field tests, APS final configuration, audible sound levels and threshold, and a list of all parameter settings.

Submit warranty documentation as an informational submittal before installing APSs.

86-5.03A(4) Quality Control and Assurance

86-5.03A(4)(a) General

The APS must be compatible with the Department-furnished Model 170E/2070L controller assembly.

The power to the APS must be connected to the pedestrian signal section terminal blocks.

The Department may test each APS. All functional and dimensional parameters specified in section 86-5.02 specifications may be tested on the APS.

Comply with section 86-2.14A.

86-5.03A(4)(b) Functional Testing

Field tests must be completed twice, when traffic is noisy such as during peak traffic hours and when traffic is quiet such as during off peak hours. Notify the Engineer 15 days before testing the APS.

86-5.03A(4)(c) Warranty

Furnish a 2-year replacement warranty from the manufacturer of the APS against any defects or failures. The effective date of the warranty is the date of acceptance of the installation. Furnish replacement parts within 10 days after receipt of the failed parts. The Department does not pay for the replacement. Deliver replacement parts to the following department maintenance electrical shop:

San Gabriel Electrical Maintenance Yard
9153 Lower Azusa Road
Rosemead, CA 91770

86-5.03A(4)(d) Training

Provide a minimum of 4 hours of training by a certified manufacturer's representative for up to 6 Department employees selected by the Engineer. The content of the training must include instructions for installing, programming, adjusting, calibrating, and maintaining the APS.

Furnish materials and equipment for the training. Notify the Engineer 15 days before the training. The time and location of the training must be agreed upon by you and the Engineer. If no agreement can be reached, the Engineer determines the time and location.

86-5.03B Materials

The APS PPB assembly must include:

1. PPB actuator with a minimum diameter of 2 inches. The PPB must be rainproof and shockproof in any weather condition. If a mechanical switch is used, the switch must have:
 - 1.1. Operating force of 3.5 lb
 - 1.2. Maximum pretravel of 5/64 inch
 - 1.3. Minimum overtravel of 1/32 inch
 - 1.4. Differential travel from 0.002 to 0.04 inch
2. Vibrotactile device on the push button or on the arrow.
3. Enclosure with an ambient sound level sensing microphone and weatherproof speaker. Type B PPB assembly may be substituted with an APS PPB assembly enclosure, but must be less than 7 lb, be less than 16 by 6 by 5 inches, and fit the standard. Maximum diameter of the hole for passage of wiring must not exceed 1.125 inches. Attachment to the pole must be with 2 screws of a diameter from 1/4 to 3/8 inch suitable for use in tapped holes. Clear space between any 2 holes in the post must be at least twice the diameter of the larger hole.

The APS PPB color must match color no. 33538 of FED-STD-595.

The APS speakers and electronic equipment must be installed inside the APS PPB assembly enclosure. Speakers must not interfere with the PPB or its mounting hardware. Speaker grills must be located on the APS PPB assembly enclosure.

The conductor cable between the APS PPB assembly and the pedestrian signal head must be a nine-no. 20-conductor cable complying with MIL-W-16878D. The wiring must comply with section 13.02 of ITE publication, Equipment and Material Standards, chapter 2, "Vehicle Traffic Control Signal Heads" and the NEC rated for service at +105 degrees C.

Electronic switches, a potentiometer, or a handheld device must be used to control and program the volume level and the messaging for the APS. After successful installation of the APS, hand over the programming mechanism to the Engineer.

The APS must:

1. Include a provision to enable and disable the APS operation
2. Have a failsafe operation. In the event of APS failure, the PPB, when pressed, must activate the pedestrian "walk" signal timing
3. Provide information using:
 - 3.1. Audible speech walk message that plays when the PPB is pressed. The message must include the name of the street to be crossed associated with that push button. An example of the message is: "Peachtree, "walk" sign is on to cross Peachtree." The message must be repeated for the duration of the walk interval. The APS must include at least 5 sound options to be played during the walk interval. The Engineer may field select the "walk" sound option. The message must be activated for use from the beginning of the walk interval. The message must have a percussive tone consisting of multiple frequencies with a dominant component of 880 Hz. If the tone is selected as the message, it must repeat 8 to 10 ticks per second.
 - 3.2. Push button information message that provides the name of the street to be crossed associated with that push button. The message must play when the PPB is pressed. An example of the message is: "Wait to cross Howard at Grand. Wait."
 - 3.3. Push button locator tone that clicks or beeps. The locator tone must come from the PPB and repeat at 1 tone per second interval. Each tone has a maximum duration of 0.15 second. The locator tone volume must adjust in response to ambient sound and be audible up to 12 feet from the push button or to the building line, whichever is less.
4. Have a functional push button that activates the pedestrian "walk" signal whenever pressed, even if the audible speech walk message, the push button information message, the push button locator tone, and the vibrating surface features are disabled

86-5.03C Construction

Arrange to have a manufacturer's representative at the job site when the APS is installed, modified, connected, or reconnected. The APS must not interfere with the Department-furnished controller assembly, the signal installation on signal standards, the pedestrian signal heads, or the terminal compartment blocks. The APS electronic control equipment must reside inside the APS PPB assembly and the standard pedestrian signal head.

You are responsible for the compatibility of the components and for making the necessary calibration adjustments to deliver the performance specified. Furnish the equipment and hardware, then set up, calibrate, and verify the performance of the APS.

Upon successful completion of the APS installation, disable the APS function if the function is not required immediately.

86-5.03D Payment

Not Used

Add to section 86-6.01:

Ballasts must be the lag regulator type.

Replace "Reserved" in section 86-6.02 with:

86-6.02 LED LUMINAIRES

86-6.02A General

86-6.02A(1) Summary

Section 86-6.02 includes specifications for installing LED luminaires.

86-6.02A(2) Definitions

CALiPER: Commercially Available LED Product Evaluation and Reporting. A U.S. DOE program that individually tests and provides unbiased information on the performance of commercially available LED luminaires and lights.

correlated color temperature: Absolute temperature in kelvin of a blackbody whose chromaticity most nearly resembles that of the light source.

house side lumens: Lumens from a luminaire directed to light up areas between the fixture and the pole (e.g., sidewalks at intersection or areas off of the shoulders on freeways).

International Electrotechnical Commission (IEC): Organization that prepares and publishes international standards for all electrical, electronic and related technologies.

junction temperature: Temperature of the electronic junction of the LED device. The junction temperature is critical in determining photometric performance, estimating operational life, and preventing catastrophic failure of the LED.

L70: Extrapolated life in hours of the luminaire when the luminous output depreciates 30 percent from initial values.

LM-79: Test method from the Illumination Engineering Society of North America (IESNA) specifying test conditions, measurements, and report format for testing solid state lighting devices, including LED luminaires.

LM-80: Test method from the IESNA specifying test conditions, measurements, and report format for testing and estimating the long term performance of LEDs for general lighting purposes.

National Voluntary Laboratory Accreditation Program (NVLAP): U.S. DOE program that accredits independent testing laboratories to qualify.

power factor: Ratio of the real power component to the complex power component.

street side lumens: Lumens from a luminaire directed to light up areas between the fixture and the roadway (e.g., traveled ways, freeway lanes).

surge protection device (SPD): Subsystem or component that can protect the unit against short duration voltage and current surges.

total harmonic distortion: Ratio of the rms value of the sum of the squared individual harmonic amplitudes to the rms value of the fundamental frequency of a complex waveform.

86-6.02A(3) Submittals

Submit a sample luminaire to METS for testing after the manufacturer's testing is completed. Include the manufacturer's testing data.

Product submittals must include:

1. LED luminaire checklist.
2. Product specification sheets, including:
 - 2.1. Maximum power in watts.
 - 2.2. Maximum designed junction temperature.
 - 2.3. Heat sink area in square inches.
 - 2.4. Designed junction to ambient thermal resistance calculation with thermal resistance components clearly defined.
 - 2.5. L70 in hours when extrapolated for the average nighttime operating temperature.
3. IES LM-79 and IES LM-80 compliant test reports from a CALiPER-qualified or NVLAP-approved testing laboratory for the specific model submitted.
4. Photometric file based on LM-79 test report.
5. Initial and depreciated isofootcandle diagrams showing the specified minimum illuminance for the particular application. The diagrams must be calibrated to feet and show a 40 by 40 foot grid. The diagrams must be calibrated to the mounting height specified for that particular application. The depreciated isofootcandle diagrams must be calculated at the minimum operational life.
6. Test report showing SPD performance as tested under ANSI/IEEE C62.41.2 and ANSI/IEEE C62.45.
7. Test report showing mechanical vibration test results as tested under California Test 611 or equal.
8. Data sheets from the LED manufacturer that include information on life expectancy based on junction temperature.
9. Data sheets from the power supply manufacturer that include life expectancy information.

Submit documentation of a production QA performed by the luminaire manufacturer that ensures the minimum performance levels of the modules comply with the section 86-6.02 specifications and includes a documented process for resolving problems. Submit documentation as an informational submittal.

Submit warranty documentation as an informational submittal before installing LED luminaires.

86-6.02A(4) Quality Control and Assurance

86-6.02A(4)(a) General

The Department may perform random sample testing on the shipments. The Department completes testing within 30 days after delivery to METS. Luminaires are tested under California Test 678. All parameters specified in section 86-6.02 specifications may be tested on the shipment sample. When testing is complete, the Department notifies you. Pick up the equipment from the test site and deliver to the job site.

One sample luminaire must be fitted with a thermistor or thermo-couple temperature sensor. A temperature sensor must be mounted on the LED solder pad as close to the LED as possible. A temperature sensor must be mounted on the power supply case. Light bar or modular systems must have 1 sensor for each module mounted as close to the center of the module as possible. Other configurations must have at least 5 sensors per luminaire. Contact METS for advice on sensor location. Thermocouples must be either Type K or C. Thermistors must be a negative temperature coefficient type with a nominal resistance of 20 k Ω . The appropriate thermocouple wire must be used. The leads must be a minimum of 6 feet. Documentation must accompany the test unit that details the type of sensor used.

The sample luminaires must be energized for a minimum of 24 hours, at 100 percent on-time duty cycle, at a temperature of +70 degrees F before performing any testing.

The luminaire lighting performance must be depreciated for the minimum operating life by using the LED manufacturer's data or the data from the LM-80 test report, whichever results in a higher lumen depreciation.

Failure of the luminaire that renders the unit noncompliant with section 86-6.02 specifications is cause for rejection. If a unit is rejected, allow 30 days for retesting. The retesting period starts when the replacement luminaire is delivered to the test site.

If a luminaire submitted for testing does not comply with section 86-6.02, remove the unit from METS within 5 business days after notification the unit is rejected. If the unit is not removed within that period, the Department may ship the unit to you and deduct the cost.

86-6.02A(4)(b) Warranty

Furnish a 7-year replacement warranty from the manufacturer of the luminaires against any defects or failures. The effective date of the warranty is the date of installation. Furnish replacement luminaires within 10 days after receipt of the failed luminaire. The Department does not pay for the replacement. Deliver replacement luminaires to the following department maintenance electrical shop:

San Gabriel Electrical Maintenance Yard
9153 Lower Azusa Road
Rosemead, CA 91770

86-6.02B Materials

86-6.02B(1) General

The luminaire must include an assembly that uses LEDs as the light source. The assembly must include a housing, an LED array, and an electronic driver. The luminaire must:

1. Be UL listed under UL 1598 for luminaires in wet locations or an equivalent standard from a recognized testing laboratory
2. Have a minimum operational life of 63,000 hours
3. Operate at an average operating time of 11.5 hours per night
4. Be designed to operate at an average nighttime operating temperature of 70 degrees F
5. Have an operating temperature range from -40 to +130 degrees F
6. Be defined by the following application:

| Application | Replaces |
|-------------|--|
| Roadway 1 | 200 Watt HPS mounted at 34 ft |
| Roadway 2 | 310 Watt HPS mounted at 40 ft |
| Roadway 3 | 310 Watt HPS mounted at 40 ft with back side control |
| Roadway 4 | 400 Watt HPS mounted at 40 ft |

The individual LEDs must be connected such that a catastrophic loss or a failure of 1 LED does not result in the loss of more than 20 percent of the luminous output of the luminaire.

86-6.02B(2) Luminaire Identification

Each luminaire must have the following identification permanently marked inside the unit and outside of its packaging box:

1. Manufacturer's name
2. Trademark
3. Model no.
4. Serial no.
5. Date of manufacture (month-year)
6. Lot number
7. Contract number
8. Rated voltage
9. Rated wattage
10. Rated power in VA

86-6.02B(3) Electrical Requirements

The luminaire must operate from a 60 ± 3 Hz AC power source. The fluctuations of line voltage must have no visible effect on the luminous output. The operating voltage may range from 120 to 480 V(ac). The luminaire must operate over the entire voltage range or the voltage range must be selected from either of the following options:

1. Luminaire must operate over a voltage range of 95 to 277 V(ac). The operating voltages for this option are 120 V(ac) and 240 V(ac).
2. Luminaire must operate over a voltage range of 347 to 480 V(ac). The operating voltage for this option is 480 V(ac).

The power factor of the luminaire must be 0.90 or greater. The total harmonic distortion, current and voltage, induced into an AC power line by a luminaire must not exceed 20 percent. The maximum power consumption allowed for the luminaire must be as shown in the following table:

| Application | Maximum consumption (Watts) |
|-------------|--------------------------------|
| Roadway 1 | 165 |
| Roadway 2 | 235 |
| Roadway 3 | 235 |
| Roadway 4 | 300 |

86-6.02B(4) Surge Suppression and Electromagnetic Interference

The luminaire on-board circuitry must include an SPD to withstand high repetition noise transients caused by utility line switching, nearby lightning strikes, and other interferences. The SPD must protect the luminaire from damage and failure due to transient voltages and currents as defined in Tables 1 and 4 of ANSI/IEEE C64.41.2 for location category C-High. The SPD must comply with UL 1449. The SPD performance must be tested under ANSI/IEEE C62.45 based on ANSI/IEEE C62.41.2 definitions for standard and optional waveforms for location category C-High.

The luminaires and associated on-board circuitry must comply with the Class A emission limits provided in 47 CFR 15, subpart B concerning the emission of electronic noise.

86-6.02B(5) Compatibility

The luminaire must be operationally compatible with currently used lighting control systems and photoelectric controls.

86-6.02B(6) Photometric Requirements

The luminaire must maintain a minimum illuminance level throughout the minimum operating life. The L70 of the luminaire must be the minimum operating life or greater. The measurements must be calibrated to standard photopic calibrations. The minimum maintained illuminance values measured at a point must be as shown in the following table:

| Application | Mounting height (ft) | Minimum maintained illuminance (fc) | Light pattern figure (isofootcandle curve) |
|-------------|-------------------------|--|---|
| Roadway 1 | 34 | 0.15 | <p>Pattern defined by an ellipse with the equation:</p> $\frac{x^2}{(82)^2} + \frac{(y - 20)^2}{(52)^2} = 1$ <p>where: x = direction longitudinal to the roadway y = direction transverse to the roadway and the luminaire is offset from the center of the pattern by 20 feet to the house side of the pattern.</p> |
| Roadway 2 | 40 | 0.2 | <p>Pattern defined by an ellipse with the equation:</p> $\frac{x^2}{(82)^2} + \frac{(y - 20)^2}{(52)^2} = 1$ <p>where: x = direction longitudinal to the roadway y = direction transverse to the roadway and the luminaire is offset from the center of the pattern by 20 feet to the house side of the pattern.</p> |
| Roadway 3 | 40 | 0.2 | <p>Pattern defined by an ellipse with the equation:</p> $\frac{x^2}{(92)^2} + \frac{(y - 23)^2}{(55)^2} = 1$ <p>for $y \geq 0$ (street side)</p> <p>where: x = direction longitudinal to the roadway y = direction transverse to the roadway and the luminaire is offset from the center of the pattern by 23 feet to the house side of the pattern.</p> |
| Roadway 4 | 40 | 0.2 | <p>Pattern defined by an ellipse with the equation:</p> $\frac{x^2}{(92)^2} + \frac{(y - 23)^2}{(55)^2} = 1$ <p>where: x = direction longitudinal to the roadway y = direction transverse to the roadway and the luminaire is offset from the center of the pattern by 23 feet to the house side of the pattern</p> |

The luminaire must have a correlated color temperature range from 3,500 to 6,500 K. The color rendering index must be 65 or greater.

The luminaire must not allow more than:

1. 10 percent of the rated lumens to project above 80 degrees from vertical
2. 2.5 percent of the rated lumens to project above 90 degrees from vertical

86-6.02B(7) Thermal Management

The passive thermal management of the heat generated by the LEDs must have enough capacity to ensure proper operation of the luminaire over the minimum operation life. The LED maximum junction temperature for the minimum operation life must not exceed 221 degrees F.

The junction-to-ambient thermal resistance must be 95 degrees F per watt or less. The use of fans or other mechanical devices is not allowed. The heat sink material must be aluminum or other material of equal or lower thermal resistance.

The luminaire must contain circuitry that automatically reduces the power to the LEDs to a level that ensures the maximum junction temperature is not exceeded when the ambient outside air temperature is 100 degrees F or greater.

86-6.02B(8) Physical and Mechanical Requirements

The luminaire must be a single, self-contained device, not requiring job site assembly for installation. The power supply for the luminaire is integral to the unit. The weight of the luminaire must not exceed 35 lb. The maximum effective projected area when viewed from either side or either end must be 1.4 sq ft. The housing color must match a color no. from 26152 to 26440 or from 36231 to 36375, or color no. 36440 of FED-STD-595.

The housing must be fabricated from materials designed to withstand a 3,000-hour salt spray test under ASTM B 117. All aluminum used in housings and brackets must be of a marine grade alloy with less than 0.2 percent copper. All exposed aluminum must be anodized.

Each refractor or lens must be made from UV-inhibited high impact plastic such as acrylic or polycarbonate or heat- and impact-resistant glass and be resistant to scratching. Polymeric materials except lenses of enclosures containing either the power supply or electronic components of the luminaire must be made of UL94VO flame retardant materials. Paint or powder coating of the housing must comply with section 86-2.16. A chromate conversion undercoating must be used underneath a thermoplastic polyester powder coat.

Each housing must be provided with a slip fitter capable of mounting on a 2-inch pipe tenon. This slip fitter must fit on mast arms with outside diameters from 1-5/8 to 2-3/8 inches. The slip fitter must be capable of being adjusted a minimum of ± 5 degrees from the axis of the tenon in a minimum of five steps: +5, +2.5, 0, -2.5, -5. The clamping brackets of the slip fitter must not bottom out on the housing bosses when adjusted within the designed angular range. No part of the slip fitter mounting brackets on the luminaires must develop a permanent set in excess of 1/32 inch when the two or four 3/8-inch diameter cap screws used for mounting are tightened to 10 ft-lb. Two sets of cap screws may be furnished to allow the slip fitter to be mounted on the pipe tenon in the acceptable range without the cap screws bottoming out in the threaded holes. The cap screws and the clamping brackets must be made of corrosion resistant materials or treated to prevent galvanic reactions and be compatible with the luminaire housing and the mast arm.

The assembly and manufacturing process for the LED luminaire must be designed to ensure internal components are adequately supported to withstand mechanical shock and vibration from high winds and other sources. When tested under California Test 611, the luminaire to be mounted horizontally on the mast arm must be capable of withstanding the following cyclic loading for a minimum of 2 million cycles without failure of any luminaire part:

Cyclic Loading

| Plane | Power supply | Minimum peak acceleration level |
|-------------------------|--------------|---|
| Vertical | Installed | 3.0 g peak-to-peak sinusoidal loading (same as 1.5 g peak) |
| Horizontal ^a | Installed | 1.5 g peak-to-peak sinusoidal loading (same as 0.75 g peak) |

^aPerpendicular to the direction of the mast arm

The housing must be designed to prevent the buildup of water on top of the housing. Exposed heat sink fins must be oriented to allow water to freely run off of the luminaire and carry dust and other accumulated debris away from the unit. The optical assembly of the luminaire must be protected against dust and moisture intrusion to at least an ANSI/IEC rating of IP66. The power supply enclosure must be protected to at least an ANSI/IEC rating of IP43.

Each mounted luminaire must be furnished with an ANSI C136.10-compliant, locking type photo control receptacle and a rain tight shorting cap. The receptacle must comply with section 86-6.11A.

When the components are mounted on a down-opening door, the door must be hinged and secured to the luminaire housing separately from the refractor or flat lens frame. The door must be secured to the housing such that accidental opening is prevented. A safety cable must mechanically connect the door to the housing.

Field wires connected to the luminaire must terminate on a barrier type terminal block secured to the housing. The terminal screws must be captive and equipped with wire grips for conductors up to no. 6. Each terminal position must be clearly identified.

The power supply must be rated for outdoor operation and have at least an ANSI/IEC rating of IP65.

The power supply must be rated for a minimum operational life equal to the minimum operational life of the luminaire or greater.

The power supply case temperature must have a self rise of 77 degrees F or less above ambient temperature in free air with no additional heat sinks.

The power supply must have 2 leads to accept standard 0-10 V(dc). The dimming control must be compatible with IEC 60929. If the control leads are open or the analog control signal is lost, the circuit must default to 100-percent power.

Conductors and terminals must be identified.

Replace "Reserved" in section 86-6.06C with:

86-6.06C(1) General

The Contractor must furnish and install in-roadway warning lights (IRWLs) under section 86-1.02, the details shown, and the special provisions.

IRWL systems must consist of the following:

1. LED light sources
2. Service equipment enclosures
3. IRWL equipment enclosures
4. Service
5. Pedestrian activation equipment

IRWL systems must be rated at 120 V(ac), 60 Hz, from 12 V(dc) to 24 V(dc), with a maximum rating of 10 W.

IRWL units must be designed for mounting onto a base plate assembly installed in the pavement or a base can assembly mounted on the pavement. IRWLs must be moisture and corrosion resistant.

Submit a certificate of compliance for IRWLs.

86-6.06C(2) Light Emitting Diode Light Source

LED light sources must consist of a housing, base plate, refractor and lens. LED light sources must utilize aluminum indium gallium phosphate (AlInGaP) technology and must be the ultra-bright type rated for 100,000 hours of continuous operation from -40 to +74 degrees C. The LED color must be yellow with a peak wavelength from 590 nanometers to 600 nanometers. LEDs must have a 30-degree viewing angle. Luminance of each IRWL must be a minimum of 650-foot lamberts measured under California Test 606.

86-6.06C(3) Service Equipment Enclosure

Service equipment enclosures must comply with section 86-2.11. Service equipment enclosures must be designed for outdoor use and have a dead front panel and hasp for padlocking the cover. Painting of service equipment enclosures must comply with section 86-2.16.

86-6.06C(4) In-Roadway Warning Light Equipment Enclosure

IRWL equipment enclosures must be Department -Furnished Model 2070 controller assembly with Model 332L controller cabinet.

Flasher units for IRWLs must be installed in IRWL equipment enclosures. Flasher units must indicate when the IRWL is activated. The flash rate must be between 50 and 60 flashes per minute. The flash rate and period for the IRWL must comply with Chapter 4L of the *California MUTCD*. The flash rate must comply with Section 8.3.3 of the National Electrical Manufacturers Association Standards Publications No. TS-1 "Traffic Control System." The minimum pedestrian crossing time must be based on a walking speed of 4 feet per second.

86-6.06C(5) Service

86-6.06C(5)(a) AC Power

Electrical service installation must comply with the requirements of the serving utility and section 86-2.11.

Barrier type terminal blocks must be rated at 10 A, 600 V, be molded from phenolic or nylon material, and have plated brass screw terminals and integral type marking strips. Each terminal position must have a permanent printed or engraved label. Labels must comply with the designations on the IRWL equipment enclosure wiring diagram provided by the manufacturer. Equipment installed inside IRWL equipment enclosures must be labeled. Terminal blocks, circuit breakers, and a power supply must be UL approved.

IRWL systems must operate from a nominal-supplied voltage, 120 V(ac) \pm 5 percent, 60 Hz inputs. Branch circuit breakers must be 10 A and a minimum of 5 branch circuit breakers must be installed inside the IRWL equipment enclosure to control AC power entering the enclosure.

86-6.06C(6) Pedestrian Activation System

Pedestrian activation systems must be manual. Manual systems must consist of a standard pedestrian push button (PPB) assembly, post, and push button. PPB assemblies must comply with section 86-5.02.

86-6.06C(7) Installation

Unless otherwise shown, the IRWL unit must not extend more than 3/4 inch above the pavement surface. The trenching method must comply with section 86-2.05C. IRWLs must be installed under the manufacturer's specifications.

Conduit must be installed under section 86-2.05C.

Replace the 3rd item of the 1st paragraph of section 86-6.09 with:

3. Type A sign

AA

DIVISION X MATERIALS

87 MATERIALS—GENERAL

Replace section 87-2 with:
87-2 AGGREGATE

87-2.01 GENERAL

87-2.01A Summary

Section 87-2 includes specifications for furnishing aggregate.

87-2.01B Definitions

stockpile lot: Stockpile or portion of a stockpile of steel slag aggregate used.

87-2.01C Submittals

Submit a certificate of compliance for:

1. Each stockpile lot
2. Steel slag

87-2.02 MATERIALS

87-2.02A General

Do not use air-cooled iron blast furnace slag to produce aggregate for:

1. Structure backfill material
2. Pervious backfill material
3. Permeable material
4. Reinforced or prestressed PCC component or structure
5. Nonreinforced PCC component or structure for which a Class 1 surface finish under section 51-1.03F(3) is required

Do not use aggregate produced from slag resulting from a steel-making process except in:

1. Imported borrow
2. AS
3. Class 2 AB
4. HMA

Steel slag used to produce aggregate for AS and Class 2 AB must be crushed such that 100 percent of the material will pass a 3/4-inch sieve and then control aged for at least 3 months under conditions that will maintain all portions of the stockpiled material at a moisture content in excess of 6 percent of the dry weight of the aggregate.

For steel slag aggregate, provide separate stockpiles for controlled aging of the slag. An individual stockpile must not contain less than 10,000 tons or more than 50,000 tons of slag. The material in each individual stockpile must be assigned a unique lot number, and each stockpile must be identified with a permanent system of signs. Maintain a permanent record of:

1. Dates for:
 - 1.1. Completion of stockpile
 - 1.2. Start of controlled aging
 - 1.3. Completion of controlled aging
 - 1.4. Making of tests
2. Test results

For each stockpile of steel slag aggregate, moisture tests must be made at least once each week. The time covered by tests that show a moisture content of 6 percent or less is not included in the aging time.

Notify METS and the Engineer upon completion of each stockpile and the start of controlled aging and upon completion of controlled aging. Do not add aggregate to a stockpile unless a new aging period is started.

Steel slag used for imported borrow must be weathered for at least 3 months.

Each delivery of aggregate containing steel slag for AS or Class 2 AB must include a delivery tag for each load. The tag must identify the lot by the stockpile number, slag aging location, and stockpile completion and controlled aging start date.

You may blend air-cooled iron blast furnace slag or natural aggregate in proper combinations with steel slag aggregate to produce the specified gradings.

California Test 202 is modified by California Test 105 whenever the difference in sp gr between the coarse and fine portions of the aggregate or between the blends of different aggregates is 0.2 or more.

For slag used as aggregate in HMA, the Kc factor requirements in California Test 303 do not apply.

If steel slag aggregates are used to produce HMA, no other aggregates may be used in the mixture except that up to 50 percent of the material passing the no. 4 sieve may consist of iron blast furnace slag aggregates, natural aggregates, or a combination of these. If iron blast furnace aggregates, natural aggregates, or a combination of these are used in the mixture, each aggregate type must be fed to the drier at a uniform rate. Maintain the feed rate of each aggregate type within 10 percent of the amount set. Provide adequate means for controlling and checking the feeder accuracy.

Store steel slag aggregate separately from iron blast furnace slag aggregate. Store each slag aggregate type separately from natural aggregate.

For HMA produced from steel slag aggregates, iron blast furnace slag aggregates, natural aggregates, or any combination of these, the same aggregate must be used throughout any one layer. Once an aggregate type is selected, do not change it without authorization.

Aggregate containing slag must comply with the applicable quality requirements for the bid items in which the aggregate is used.

87-2.03 CONSTRUCTION

Do not place aggregate produced from slag within 1 foot of a non-cathodically protected pipe or structure unless the aggregate is incorporated in concrete pavement, in HMA, or in treated base.

Do not place slag aggregate used for embankments within 18 inches of finished slope lines measured normal to the plane of the slope.

Whenever slag aggregate is used for imported borrow, place a layer of topsoil at least 24 inches thick after compaction over the slag aggregate in highway planting areas.

87-2.04 PAYMENT

The Department reduces the payment quantity of HMA if:

1. Steel slag aggregates are used to produce HMA
2. The sp gr of a compacted stabilometer test specimen is in excess of 2.40

The Department prepares the stabilometer test specimen under California Test 304 and determines the sp gr of the specimen under Method C of California Test 308.

The Department determines the HMA payment quantity by multiplying the quantity of HMA placed in the work by 2.40 and dividing the result by the sp gr of the compacted stabilometer test specimen. The Department applies this quantity reduction as often as necessary to ensure accurate results.

**REVISED STANDARD SPECIFICATIONS
APPLICABLE TO THE 2010 EDITION
OF THE STANDARD SPECIFICATIONS**

REVISED STANDARD SPECIFICATIONS DATED 04-19-13

Revised standard specifications are under headings that correspond with the main-section headings of the *Standard Specifications*. A main-section heading is a heading shown in the table of contents of the *Standard Specifications*. A date under a main-section heading is the date of the latest revision to the section.

Each revision to the *Standard Specifications* begins with a revision clause that describes a revision to the *Standard Specifications* or introduces a revision to the *Standard Specifications*. For a revision clause that describes a revision, the date on the right above the clause is the publication date of the revision. For a revision clause that introduces a revision, the date on the right above a revised term, phrase, clause, paragraph, or section is the publication date of the revised term, phrase, clause, paragraph, or section. For a multiple-paragraph or multiple-section revision, the date on the right above a paragraph or section is the publication date of the paragraphs or sections that follow.

Any paragraph added or deleted by a revision clause does not change the paragraph numbering of the *Standard Specifications* for any other reference to a paragraph of the *Standard Specifications*.

DIVISION I GENERAL PROVISIONS

1 GENERAL

04-19-13

Replace "current" in the 2nd paragraph of section 1-1.05 with:

most recent

04-20-12

Add to the 4th paragraph of section 1-1.05:

04-20-12

Any reference directly to a revised standard specification section is for convenience only. Lack of a direct reference to a revised standard specification section does not indicate a revised standard specification for the section does not exist.

Add to the 1st table in section 1-1.06:

04-19-13

| | |
|-----|----------------------------------|
| LCS | Department's lane closure system |
| POC | pedestrian overcrossing |
| QSD | qualified SWPPP developer |
| QSP | qualified SWPPP practitioner |
| TRO | time-related overhead |
| WPC | water pollution control |

Delete the abbreviation and its meaning for *UDBE* in the 1st table of section 1-1.06.

06-20-12

Delete "Contract completion date" and its definition in section 1-1.07B.

10-19-12

Delete "critical delay" and its definition in section 1-1.07B.

10-19-12

Replace "day" and its definition in section 1-1.07B with:

10-19-12

day: 24 consecutive hours running from midnight to midnight; calendar day.

1. **business day:** Day on the calendar except a Saturday and a holiday.
2. **working day:** Time measure unit for work progress. A working day is any 24-consecutive-hour period except:
 - 2.1. Saturday and holiday.
 - 2.2. Day during which you cannot perform work on the controlling activity for at least 50 percent of the scheduled work shift with at least 50 percent of the scheduled labor and equipment due to any of the following:
 - 2.2.1. Adverse weather-related conditions.
 - 2.2.2. Maintaining traffic under the Contract.
 - 2.2.3. Suspension of a controlling activity that you and the Engineer agree benefits both parties.
 - 2.2.4. Unanticipated event not caused by either party such as:
 - 2.2.4.1. Act of God.
 - 2.2.4.2. Act of a public enemy.
 - 2.2.4.3. Epidemic.
 - 2.2.4.4. Fire.
 - 2.2.4.5. Flood.
 - 2.2.4.6. Governor-declared state of emergency.
 - 2.2.4.7. Landslide.
 - 2.2.4.8. Quarantine restriction.
 - 2.2.5. Issue involving a third party, including:
 - 2.2.5.1. Industry or area-wide labor strike.
 - 2.2.5.2. Material shortage.
 - 2.2.5.3. Freight embargo.
 - 2.2.5.4. Jurisdictional requirement of a law enforcement agency.
 - 2.2.5.5. Workforce labor dispute of a utility or nonhighway facility owner resulting in a nonhighway facility rearrangement not described and not solely for the Contractor's convenience. Rearrangement of a nonhighway facility includes installation, relocation, alteration, or removal of the facility.
 - 2.3. Day during a concurrent delay.
3. **original working days:**
 - 3.1. Working days to complete the work shown on the *Notice to Bidders* for a non-cost plus time based bid.
 - 3.2. Working days bid to complete the work for a cost plus time based bid.

Where working days is specified without the modifier "original" in the context of the number of working days to complete the work, interpret the number as the number of original working days as adjusted by any time adjustment.

Replace "Contract" in the definition of "early completion time" in section 1-1.07B with:

10-19-12

work

Replace "excusable delay" and its definition in section 1-1.07B with:

10-19-12

delay: Event that extends the completion of an activity.

1. **excusable delay:** Delay caused by the Department and not reasonably foreseeable when the work began such as:
 - 1.1. Change in the work
 - 1.2. Department action that is not part of the Contract
 - 1.3. Presence of an underground utility main not described in the Contract or in a location substantially different from that specified
 - 1.4. Described facility rearrangement not rearranged as described, by the utility owner by the date specified, unless the rearrangement is solely for the Contractor's convenience
 - 1.5. Department's failure to obtain timely access to the right-of-way
 - 1.6. Department's failure to review a submittal or provide notification in the time specified
2. **critical delay:** Excusable delay that extends the scheduled completion date
3. **concurrent delay:** Occurrence of at least 2 of the following events in the same period of time, either partially or entirely:
 - 3.1. Critical delay
 - 3.2. Delay to a controlling activity caused by you
 - 3.3. Non-working day

Replace "project" in the definition of "scheduled completion date" in section 1-1.07B with:

10-19-12

work

Add to section 1-1.07B:

10-19-12

Contract time: Number of original working days as adjusted by any time adjustment.

06-20-12

Disadvantaged Business Enterprise: Disadvantaged Business Enterprise as defined in 49 CFR 26.5.

Replace "PO BOX 911" in the District 3 mailing address in the table in section 1-1.08 with:

04-20-12

703 B ST

Add to the table in section 1-1.11:

01-20-12

| | | | |
|--|---|----|----|
| Office Engineer--All Projects Currently Advertised | http://www.dot.ca.gov/hq/esc/oe/weekly_ads/all_advertised.php | -- | -- |
|--|---|----|----|

AA

2 BIDDING

10-19-12

Replace the 3rd paragraph of section 2-1.06B with:

01-20-12

If an *Information Handout* or cross sections are available:

1. You may view them at the Contract Plans and Special Provisions link at the Office Engineer–All Projects Currently Advertised Web site
2. For an informal-bid contract, you may obtain them at the Bidders' Exchange street address

01-20-12

Add a paragraph break between the 1st and 2nd sentences of the 5th paragraph of section 2-1.06B.

Add between "and" and "are" in item 2 in the list in the 7th paragraph of section 2-1.06B:

they

04-20-12

06-20-12

Delete "Underutilized" in "Underutilized Disadvantaged Business Enterprises" in the heading of section 2-1.12B.

Delete *U* in *UDBE* at each occurrence in section 2-1.12B.

06-20-12

Replace the 2nd paragraph of section 2-1.12B(1) with:

To ensure equal participation of DBEs provided in 49 CFR 26.5, the Department shows a goal for DBEs.

06-20-12

Delete the 3rd paragraph of section 2-1.12B(1):

06-20-12

Replace the 7th paragraph of section 2-1.12B(1) with:

All DBE participation will count toward the Department's federally-mandated statewide overall DBE goal.

06-20-12

Replace "offered" at the end of the 2nd sentence of item 7 in the list of 2nd paragraph of section 2-1.12B(3) with:

provided

06-20-12

Delete the 2nd paragraph of section 2-1.33A.

01-20-12

Replace the 3rd paragraph of section 2-1.33A with:

Except for each subcontracted bid item number and corresponding percentage and proof of each required SSPC QP certification, do not fax submittals.

01-20-12

Add to section 2-1.33C:

10-19-12

On the *Subcontractor List*, you must either submit each subcontracted bid item number and corresponding percentage with your bid or fax these numbers and percentages to (916) 227-6282 within 24 hours after bid opening. Failure to do so results in a nonresponsive bid.

Replace the paragraph in section 2-1.35 with:

01-20-12

Submit proof of each required SSPC QP certification with your bid or fax it to (916) 227-6282 no later than 4:00 p.m. on the 2nd business day after bid opening. Failure to do so results in a nonresponsive bid.

AA

3 CONTRACT AWARD AND EXECUTION

10-19-12

Add to the end of section 3-1.04:

10-19-12

You may request to extend the award period by faxing a request to (916) 227-6282 before 4:00 p.m. on the last day of the award period. If you do not make this request, after the specified award period:

- 1. Your bid becomes invalid
- 2. You are not eligible for the award of the contract

Replace the paragraph in section 3-1.11 with:

10-19-12

Complete and deliver to the Office Engineer a *Payee Data Record* when requested by the Department.

Replace section 3-1.13 with:

07-27-12

3-1.13 FORM FHWA-1273

For a federal-aid contract, form FHWA-1273 is included with the Contract form in the documents sent to the successful bidder for execution. Comply with its provisions. Interpret the training and promotion section as specified in section 7-1.11A.

Add to item 1 in the list in the 2nd paragraph of section 3-1.18:

07-27-12

, including the attached form FHWA-1273

Delete item 4 of the 2nd paragraph of section 3-1.18.

10-19-12

AA

5 CONTROL OF WORK

10-19-12

Add between "million" and ", professionally" in the 3rd paragraph of section 5-1.09A:

and 100 or more working days

10-19-12

Add to the list in the 4th paragraph of section 5-1.09A:

9. Considering discussing with and involving all stakeholders in evaluating potential VECPs

10-19-12

Add to the end of item 1.1 in the list in the 7th paragraph of section 5-1.09A:

, including VECPs

10-19-12

Replace the 1st paragraph of section 5-1.09C with:

For a contract with a total bid over \$10 million and 100 or more working days, training in partnering skills development is required.

10-19-12

Delete the 2nd paragraph of section 5-1.09C.

10-19-12

Replace "at least 2 representatives" in the 5th paragraph of section 5-1.09C with:

field supervisory personnel

10-19-12

Replace the 1st and 2nd sentences in the 7th paragraph of section 5-1.13B(1) with:

If a DBE is decertified before completing its work, the DBE must notify you in writing of the decertification date. If a business becomes a certified DBE before completing its work, the business must notify you in writing of the certification date.

06-20-12

Replace "90" in the last sentence of the 7th paragraph of section 5-1.13B(1) with:

30

06-20-12

Replace "Underutilized" in "Underutilized Disadvantaged Business Enterprises" in the heading of section 5-1.13B(2) with:

Performance of

06-20-12

Delete *U* in *UDBE* at each occurrence in section 5-1.13B(2).

06-20-12

Replace the 3rd paragraph of section 5-1.13B(2) with:

06-20-12

Do not terminate or substitute a listed DBE for convenience and perform the work with your own forces or obtain materials from other sources without authorization from the Department.

Replace item 6 in the list in the 4th paragraph of section 5-1.13B(2) with:

06-20-12

6. Listed DBE is ineligible to work on the project because of suspension or debarment.

Add to the list in the 4th paragraph of section 5-1.13B(2):

06-20-12

8. Listed DBE voluntarily withdraws with written notice from the Contract.
9. Listed DBE is ineligible to receive credit for the type of work required.
10. Listed DBE owner dies or becomes disabled resulting in the inability to perform the work on the Contract.
11. Department determines other documented good cause.

Add between the 4th and 5th paragraphs of section 5-1.13B(2):

07-20-12

Notify the original DBE of your intent to use other forces or material sources and provide the reasons. Provide the DBE with 5 days to respond to your notice and advise you and the Department of the reasons why the use of other forces or sources of materials should not occur. Your request to use other forces or material sources must include:

1. 1 or more of the reasons listed in the preceding paragraph
2. Notices from you to the DBE regarding the request
3. Notices from the DBE to you regarding the request

Add between "terminated" and ", you" in the 5th paragraph of section 5-1.13B(2):

07-20-12

or substituted

Replace "Contract" in item 1 in the list in the 5th paragraph of section 5-1.13C with:

10-19-12

work

Replace "Reserved" in section 5-1.20C with:

10-19-12

If the Contract includes an agreement with a railroad company, the Department makes the provisions of the agreement available in the *Information Handout* in the document titled "Railroad Relations and Insurance Requirements." Comply with the requirements in the document.

Add between the 2nd and 3rd paragraphs of section 5-1.23A:

10-19-12

Submit action and informational submittals to the Engineer.

Add to section 5-1.36C:

07-20-12

If the Contract does not include an agreement with a railroad company, do not allow personnel or equipment on railroad property.

Prevent material, equipment, and debris from falling onto railroad property.

Add between the 1st and 2nd paragraphs of section 5-1.37A:

10-19-12

Do not remove any padlock used to secure a portion of the work until the Engineer is present to replace it. Notify the Engineer at least 3 days before removing the lock.

Replace the 1st sentence of the 1st paragraph of section 5-1.39C(2) with:

10-19-12

Section 5-1.39C(2) applies if a plant establishment period of 3 years or more is shown on the *Notice to Bidders*.

Replace "working days" in the 1st paragraph of section 5-1.43E(1)(a) with:

10-19-12

original working days

^^

6 CONTROL OF MATERIALS

04-19-13

Replace section 6-2.05C with:

04-19-13

6-2.05C Steel and Iron Materials

Steel and iron materials must be melted and manufactured in the United States except:

1. Foreign pig iron and processed, pelletized, and reduced iron ore may be used in the domestic production of the steel and iron materials
2. If the total combined cost of the materials does not exceed the greater of 0.1 percent of the total bid or \$2,500, materials produced outside the United States may be used if authorized

Furnish steel and iron materials to be incorporated into the work with certificates of compliance and certified mill test reports. Mill test reports must indicate where the steel and iron were melted and manufactured.

All melting and manufacturing processes for these materials, including an application of a coating, must occur in the United States. Coating includes all processes that protect or enhance the value of the material to which the coating is applied.

^^

7 LEGAL RELATIONS AND RESPONSIBILITY TO THE PUBLIC

07-27-12

Replace "20 days" in the 14th paragraph of section 7-1.04 with:

25 days

09-16-11

Replace "90 days" in the 14th paragraph of section 7-1.04 with:

125 days

09-16-11

Add between the 18th and 19th paragraphs of section 7-1.04:

09-16-11

Temporary facilities that could be a hazard to public safety if improperly designed must comply with design requirements described in the Contract for those facilities or, if none are described, with standard design criteria or codes appropriate for the facility involved. Submit shop drawings and design calculations for the temporary facilities and show the standard design criteria or codes used. Shop drawings and supplemental calculations must be sealed and signed by an engineer who is registered as a civil engineer in the State.

Replace the 2nd paragraph of section 7-1.11A with:

07-27-12

A copy of form FHWA-1273 is included in section 7-1.11B. The training and promotion section of section II refers to training provisions as if they were included in the special provisions. The Department specifies the provisions in section 7-1.11D of the *Standard Specifications*. If a number of trainees or apprentices is required, the Department shows the number on the *Notice to Bidders*. Interpret each FHWA-1273 clause shown in the following table as having the same meaning as the corresponding Department clause:

FHWA-1273 Nondiscrimination Clauses

| FHWA-1273 section | FHWA-1273 clause | Department clause |
|------------------------|--|---|
| Training and Promotion | In the event a special provision for training is provided under this contract, this subparagraph will be superseded as indicated in the special provision. | If section 7-1.11D applies, section 7-1.11D supersedes this subparagraph. |
| Records and Reports | If on-the-job training is being required by special provision, the contractor will be required to collect and report training data. | If the Contract requires on-the-job training, collect and report training data. |

Replace the form in section 7-1.11B with:

07-20-12

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

- I. General
- II. Nondiscrimination
- III. Nonsegregated Facilities
- IV. Davis-Bacon and Related Act Provisions
- V. Contract Work Hours and Safety Standards Act Provisions
- VI. Subletting or Assigning the Contract
- VII. Safety: Accident Prevention
- VIII. False Statements Concerning Highway Projects
- IX. Implementation of Clean Air Act and Federal Water Pollution Control Act
- X. Compliance with Governmentwide Suspension and Debarment Requirements
- XI. Certification Regarding Use of Contract Funds for Lobbying

3. A breach of any of the stipulations contained in these Required Contract Provisions may be sufficient grounds for withholding of progress payments, withholding of final payment, termination of the contract, suspension / debarment or any other action determined to be appropriate by the contracting agency and FHWA.

4. Selection of Labor: During the performance of this contract, the contractor shall not use convict labor for any purpose within the limits of a construction project on a Federal-aid highway unless it is labor performed by convicts who are on parole, supervised release, or probation. The term Federal-aid highway does not include roadways functionally classified as local roads or rural minor collectors.

ATTACHMENTS

A. Employment and Materials Preference for Appalachian Development Highway System or Appalachian Local Access Road Contracts (included in Appalachian contracts only)

II. NONDISCRIMINATION

The provisions of this section related to 23 CFR Part 230 are applicable to all Federal-aid construction contracts and to all related construction subcontracts of \$10,000 or more. The provisions of 23 CFR Part 230 are not applicable to material supply, engineering, or architectural service contracts.

I. GENERAL

1. Form FHWA-1273 must be physically incorporated in each construction contract funded under Title 23 (excluding emergency contracts solely intended for debris removal). The contractor (or subcontractor) must insert this form in each subcontract and further require its inclusion in all lower tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services).

In addition, the contractor and all subcontractors must comply with the following policies: Executive Order 11246, 41 CFR 60, 29 CFR 1625-1627, Title 23 USC Section 140, the Rehabilitation Act of 1973, as amended (29 USC 794), Title VI of the Civil Rights Act of 1964, as amended, and related regulations including 49 CFR Parts 21, 26 and 27; and 23 CFR Parts 200, 230, and 633.

The applicable requirements of Form FHWA-1273 are incorporated by reference for work done under any purchase order, rental agreement or agreement for other services. The prime contractor shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider.

The contractor and all subcontractors must comply with: the requirements of the Equal Opportunity Clause in 41 CFR 60-1.4(b) and, for all construction contracts exceeding \$10,000, the Standard Federal Equal Employment Opportunity Construction Contract Specifications in 41 CFR 60-4.3.

Form FHWA-1273 must be included in all Federal-aid design-build contracts, in all subcontracts and in lower tier subcontracts (excluding subcontracts for design services, purchase orders, rental agreements and other agreements for supplies or services). The design-builder shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider.

Note: The U.S. Department of Labor has exclusive authority to determine compliance with Executive Order 11246 and the policies of the Secretary of Labor including 41 CFR 60, and 29 CFR 1625-1627. The contracting agency and the FHWA have the authority and the responsibility to ensure compliance with Title 23 USC Section 140, the Rehabilitation Act of 1973, as amended (29 USC 794), and Title VI of the Civil Rights Act of 1964, as amended, and related regulations including 49 CFR Parts 21, 26 and 27; and 23 CFR Parts 200, 230, and 633.

Contracting agencies may reference Form FHWA-1273 in bid proposal or request for proposal documents, however, the Form FHWA-1273 must be physically incorporated (not referenced) in all contracts, subcontracts and lower-tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services related to a construction contract).

The following provision is adopted from 23 CFR 230, Appendix A, with appropriate revisions to conform to the U.S. Department of Labor (US DOL) and FHWA requirements.

2. Subject to the applicability criteria noted in the following sections, these contract provisions shall apply to all work performed on the contract by the contractor's own organization and with the assistance of workers under the contractor's immediate superintendence and to all work performed on the contract by piecework, station work, or by subcontract.

1. Equal Employment Opportunity: Equal employment opportunity (EEO) requirements not to discriminate and to take affirmative action to assure equal opportunity as set forth under laws, executive orders, rules, regulations (28 CFR 35, 29 CFR 1630, 29 CFR 1625-1627, 41 CFR 60 and 49 CFR 27) and orders of the Secretary of Labor as modified by the provisions prescribed herein, and imposed pursuant to 23 U.S.C. 140 shall constitute the EEO and specific affirmative action standards for the contractor's project activities under

this contract. The provisions of the Americans with Disabilities Act of 1990 (42 U.S.C. 12101 et seq.) set forth under 28 CFR 35 and 29 CFR 1630 are incorporated by reference in this contract. In the execution of this contract, the contractor agrees to comply with the following minimum specific requirement activities of EEO:

a. The contractor will work with the contracting agency and the Federal Government to ensure that it has made every good faith effort to provide equal opportunity with respect to all of its terms and conditions of employment and in their review of activities under the contract.

b. The contractor will accept as its operating policy the following statement:

"It is the policy of this Company to assure that applicants are employed, and that employees are treated during employment, without regard to their race, religion, sex, color, national origin, age or disability. Such action shall include: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship, pre-apprenticeship, and/or on-the-job training."

2. EEO Officer: The contractor will designate and make known to the contracting officers an EEO Officer who will have the responsibility for and must be capable of effectively administering and promoting an active EEO program and who must be assigned adequate authority and responsibility to do so.

3. Dissemination of Policy: All members of the contractor's staff who are authorized to hire, supervise, promote, and discharge employees, or who recommend such action, or who are substantially involved in such action, will be made fully cognizant of, and will implement, the contractor's EEO policy and contractual responsibilities to provide EEO in each grade and classification of employment. To ensure that the above agreement will be met, the following actions will be taken as a minimum:

a. Periodic meetings of supervisory and personnel office employees will be conducted before the start of work and then not less often than once every six months, at which time the contractor's EEO policy and its implementation will be reviewed and explained. The meetings will be conducted by the EEO Officer.

b. All new supervisory or personnel office employees will be given a thorough indoctrination by the EEO Officer, covering all major aspects of the contractor's EEO obligations within thirty days following their reporting for duty with the contractor.

c. All personnel who are engaged in direct recruitment for the project will be instructed by the EEO Officer in the contractor's procedures for locating and hiring minorities and women.

d. Notices and posters setting forth the contractor's EEO policy will be placed in areas readily accessible to employees, applicants for employment and potential employees.

e. The contractor's EEO policy and the procedures to implement such policy will be brought to the attention of employees by means of meetings, employee handbooks, or other appropriate means.

4. Recruitment: When advertising for employees, the contractor will include in all advertisements for employees the notation: "An Equal Opportunity Employer." All such advertisements will be placed in publications having a large circulation among minorities and women in the area from which the project work force would normally be derived.

a. The contractor will, unless precluded by a valid bargaining agreement, conduct systematic and direct recruitment through public and private employee referral sources likely to yield qualified minorities and women. To meet this requirement, the contractor will identify sources of potential minority group employees, and establish with such identified sources procedures whereby minority and women applicants may be referred to the contractor for employment consideration.

b. In the event the contractor has a valid bargaining agreement providing for exclusive hiring hall referrals, the contractor is expected to observe the provisions of that agreement to the extent that the system meets the contractor's compliance with EEO contract provisions. Where implementation of such an agreement has the effect of discriminating against minorities or women, or obligates the contractor to do the same, such implementation violates Federal nondiscrimination provisions.

c. The contractor will encourage its present employees to refer minorities and women as applicants for employment. Information and procedures with regard to referring such applicants will be discussed with employees.

5. Personnel Actions: Wages, working conditions, and employee benefits shall be established and administered, and personnel actions of every type, including hiring, upgrading, promotion, transfer, demotion, layoff, and termination, shall be taken without regard to race, color, religion, sex, national origin, age or disability. The following procedures shall be followed:

a. The contractor will conduct periodic inspections of project sites to insure that working conditions and employee facilities do not indicate discriminatory treatment of project site personnel.

b. The contractor will periodically evaluate the spread of wages paid within each classification to determine any evidence of discriminatory wage practices.

c. The contractor will periodically review selected personnel actions in depth to determine whether there is evidence of discrimination. Where evidence is found, the contractor will promptly take corrective action. If the review indicates that the discrimination may extend beyond the actions reviewed, such corrective action shall include all affected persons.

d. The contractor will promptly investigate all complaints of alleged discrimination made to the contractor in connection with its obligations under this contract, will attempt to resolve such complaints, and will take appropriate corrective action within a reasonable time. If the investigation indicates that the discrimination may affect persons other than the complainant, such corrective action shall include such other persons. Upon completion of each investigation, the contractor will inform every complainant of all of their avenues of appeal.

6. Training and Promotion:

a. The contractor will assist in locating, qualifying, and increasing the skills of minorities and women who are

applicants for employment or current employees. Such efforts should be aimed at developing full journey level status employees in the type of trade or job classification involved.

b. Consistent with the contractor's work force requirements and as permissible under Federal and State regulations, the contractor shall make full use of training programs, i.e., apprenticeship, and on-the-job training programs for the geographical area of contract performance. In the event a special provision for training is provided under this contract, this subparagraph will be superseded as indicated in the special provision. The contracting agency may reserve training positions for persons who receive welfare assistance in accordance with 23 U.S.C. 140(a).

c. The contractor will advise employees and applicants for employment of available training programs and entrance requirements for each.

d. The contractor will periodically review the training and promotion potential of employees who are minorities and women and will encourage eligible employees to apply for such training and promotion.

7. Unions: If the contractor relies in whole or in part upon unions as a source of employees, the contractor will use good faith efforts to obtain the cooperation of such unions to increase opportunities for minorities and women. Actions by the contractor, either directly or through a contractor's association acting as agent, will include the procedures set forth below:

a. The contractor will use good faith efforts to develop, in cooperation with the unions, joint training programs aimed toward qualifying more minorities and women for membership in the unions and increasing the skills of minorities and women so that they may qualify for higher paying employment.

b. The contractor will use good faith efforts to incorporate an EEO clause into each union agreement to the end that such union will be contractually bound to refer applicants without regard to their race, color, religion, sex, national origin, age or disability.

c. The contractor is to obtain information as to the referral practices and policies of the labor union except that to the extent such information is within the exclusive possession of the labor union and such labor union refuses to furnish such information to the contractor, the contractor shall so certify to the contracting agency and shall set forth what efforts have been made to obtain such information.

d. In the event the union is unable to provide the contractor with a reasonable flow of referrals within the time limit set forth in the collective bargaining agreement, the contractor will, through independent recruitment efforts, fill the employment vacancies without regard to race, color, religion, sex, national origin, age or disability; making full efforts to obtain qualified and/or qualifiable minorities and women. The failure of a union to provide sufficient referrals (even though it is obligated to provide exclusive referrals under the terms of a collective bargaining agreement) does not relieve the contractor from the requirements of this paragraph. In the event the union referral practice prevents the contractor from meeting the obligations pursuant to Executive Order 11246, as amended, and these special provisions, such contractor shall immediately notify the contracting agency.

8. Reasonable Accommodation for Applicants / Employees with Disabilities: The contractor must be familiar

with the requirements for and comply with the Americans with Disabilities Act and all rules and regulations established there under. Employers must provide reasonable accommodation in all employment activities unless to do so would cause an undue hardship.

9. Selection of Subcontractors, Procurement of Materials and Leasing of Equipment: The contractor shall not discriminate on the grounds of race, color, religion, sex, national origin, age or disability in the selection and retention of subcontractors, including procurement of materials and leases of equipment. The contractor shall take all necessary and reasonable steps to ensure nondiscrimination in the administration of this contract.

a. The contractor shall notify all potential subcontractors and suppliers and lessors of their EEO obligations under this contract.

b. The contractor will use good faith efforts to ensure subcontractor compliance with their EEO obligations.

10. Assurance Required by 49 CFR 26.13(b):

a. The requirements of 49 CFR Part 26 and the State DOT's U.S. DOT-approved DBE program are incorporated by reference.

b. The contractor or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR Part 26 in the award and administration of DOT-assisted contracts. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the contracting agency deems appropriate.

11. Records and Reports: The contractor shall keep such records as necessary to document compliance with the EEO requirements. Such records shall be retained for a period of three years following the date of the final payment to the contractor for all contract work and shall be available at reasonable times and places for inspection by authorized representatives of the contracting agency and the FHWA.

a. The records kept by the contractor shall document the following:

(1) The number and work hours of minority and non-minority group members and women employed in each work classification on the project;

(2) The progress and efforts being made in cooperation with unions, when applicable, to increase employment opportunities for minorities and women; and

(3) The progress and efforts being made in locating, hiring, training, qualifying, and upgrading minorities and women;

b. The contractors and subcontractors will submit an annual report to the contracting agency each July for the duration of the project, indicating the number of minority, women, and non-minority group employees currently engaged in each work classification required by the contract work. This information is to be reported on [Form FHWA-1391](#). The staffing data should represent the project work force on board in all or any part of the last payroll period preceding the end of July. If on-the-job training is being required by special provision, the contractor

will be required to collect and report training data. The employment data should reflect the work force on board during all or any part of the last payroll period preceding the end of July.

III. NONSEGREGATED FACILITIES

This provision is applicable to all Federal-aid construction contracts and to all related construction subcontracts of \$10,000 or more.

The contractor must ensure that facilities provided for employees are provided in such a manner that segregation on the basis of race, color, religion, sex, or national origin cannot result. The contractor may neither require such segregated use by written or oral policies nor tolerate such use by employee custom. The contractor's obligation extends further to ensure that its employees are not assigned to perform their services at any location, under the contractor's control, where the facilities are segregated. The term "facilities" includes waiting rooms, work areas, restaurants and other eating areas, time clocks, restrooms, washrooms, locker rooms, and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing provided for employees. The contractor shall provide separate or single-user restrooms and necessary dressing or sleeping areas to assure privacy between sexes.

IV. DAVIS-BACON AND RELATED ACT PROVISIONS

This section is applicable to all Federal-aid construction projects exceeding \$2,000 and to all related subcontracts and lower-tier subcontracts (regardless of subcontract size). The requirements apply to all projects located within the right-of-way of a roadway that is functionally classified as Federal-aid highway. This excludes roadways functionally classified as local roads or rural minor collectors, which are exempt. Contracting agencies may elect to apply these requirements to other projects.

The following provisions are from the U.S. Department of Labor regulations in 29 CFR 5.5 "Contract provisions and related matters" with minor revisions to conform to the FHWA-1273 format and FHWA program requirements.

1. Minimum wages

a. All laborers and mechanics employed or working upon the site of the work, will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR part 3)), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics.

Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions

of paragraph 1.d. of this section; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in 29 CFR 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: Provided, That the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under paragraph 1.b. of this section) and the Davis-Bacon poster (WH-1321) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.

b. (1) The contracting officer shall require that any class of laborers or mechanics, including helpers, which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. The contracting officer shall approve an additional classification and wage rate and fringe benefits therefore only when the following criteria have been met:

(i) The work to be performed by the classification requested is not performed by a classification in the wage determination; and

(ii) The classification is utilized in the area by the construction industry; and

(iii) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(2) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the contracting officer agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by the contracting officer to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, DC 20210. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(3) In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and the contracting officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the contracting officer shall refer the questions, including the views of all interested parties and the recommendation of the contracting officer, to the Wage and Hour Administrator for determination. The Wage and Hour Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the contracting officer or

will notify the contracting officer within the 30-day period that additional time is necessary.

(4) The wage rate (including fringe benefits where appropriate) determined pursuant to paragraphs 1.b.(2) or 1.b.(3) of this section, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

c. Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

d. If the contractor does not make payments to a trustee or other third person, the contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program. Provided, That the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

2. Withholding

The contracting agency shall upon its own action or upon written request of an authorized representative of the Department of Labor, withhold or cause to be withheld from the contractor under this contract, or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work, all or part of the wages required by the contract, the contracting agency may, after written notice to the contractor, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

3. Payrolls and basic records

a. Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5(a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-

Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

b. (1) The contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to the contracting agency. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under 29 CFR 5.5(a)(3)(i), except that full social security numbers and home addresses shall not be included on weekly transmittals. Instead the payrolls shall only need to include an individually identifying number for each employee (e.g., the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH-347 is available for this purpose from the Wage and Hour Division Web site at <http://www.dol.gov/esa/whd/forms/wh347instr.htm> or its successor site. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractors and subcontractors shall maintain the full social security number and current address of each covered worker, and shall provide them upon request to the contracting agency for transmission to the State DOT, the FHWA or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this section for a prime contractor to require a subcontractor to provide addresses and social security numbers to the prime contractor for its own records, without weekly submission to the contracting agency..

(2) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

(i) That the payroll for the payroll period contains the information required to be provided under §5.5 (a)(3)(ii) of Regulations, 29 CFR part 5, the appropriate information is being maintained under §5.5 (a)(3)(i) of Regulations, 29 CFR part 5, and that such information is correct and complete;

(ii) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in Regulations, 29 CFR part 3;

(iii) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

(3) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph 3.b.(2) of this section.

(4) The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under section 1001 of title 18 and section 231 of title 31 of the United States Code.

c. The contractor or subcontractor shall make the records required under paragraph 3.a. of this section available for inspection, copying, or transcription by authorized representatives of the contracting agency, the State DOT, the FHWA, or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, the FHWA may, after written notice to the contractor, the contracting agency or the State DOT, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

4. Apprentices and trainees

a. Apprentices (programs of the USDOL).

Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship Training, Employer and Labor Services, or with a State Apprenticeship Agency recognized by the Office, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Office of Apprenticeship Training, Employer and Labor Services or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice.

The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the contractor's or subcontractor's registered program shall be observed.

Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly

rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination.

In the event the Office of Apprenticeship Training, Employer and Labor Services, or a State Apprenticeship Agency recognized by the Office, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

b. Trainees (programs of the USDOL).

Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration.

The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration.

Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed.

In the event the Employment and Training Administration withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

c. Equal employment opportunity. The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR part 30.

d. Apprentices and Trainees (programs of the U.S. DOT).

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

5. Compliance with Copeland Act requirements. The contractor shall comply with the requirements of 29 CFR part 3, which are incorporated by reference in this contract.

6. Subcontracts. The contractor or subcontractor shall insert Form FHWA-1273 in any subcontracts and also require the subcontractors to include Form FHWA-1273 in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in 29 CFR 5.5.

7. Contract termination; debarment. A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the contract, and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.

8. Compliance with Davis-Bacon and Related Act requirements. All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR parts 1, 3, and 5 are herein incorporated by reference in this contract.

9. Disputes concerning labor standards. Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and the contracting agency, the U.S. Department of Labor, or the employees or their representatives.

10. Certification of eligibility.

a. By entering into this contract, the contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

b. No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

c. The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001.

V. CONTRACT WORK HOURS AND SAFETY STANDARDS ACT

The following clauses apply to any Federal-aid construction contract in an amount in excess of \$100,000 and subject to the overtime provisions of the Contract Work Hours and Safety Standards Act. These clauses shall be inserted in addition to the clauses required by 29 CFR 5.5(a) or 29 CFR 4.6. As used in this paragraph, the terms laborers and mechanics include watchmen and guards.

1. Overtime requirements. No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

2. Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in paragraph (1.) of this section, the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (1.) of this section, in the sum of \$10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (1.) of this section.

3. Withholding for unpaid wages and liquidated damages. The FHWA or the contracting agency shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (2.) of this section.

4. Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (1.) through (4.) of this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (1.) through (4.) of this section.

VI. SUBLETTING OR ASSIGNING THE CONTRACT

This provision is applicable to all Federal-aid construction contracts on the National Highway System.

1. The contractor shall perform with its own organization contract work amounting to not less than 30 percent (or a greater percentage if specified elsewhere in the contract) of the total original contract price, excluding any specialty items designated by the contracting agency. Specialty items may be performed by subcontract and the amount of any such specialty items performed may be deducted from the total original contract price before computing the amount of work required to be performed by the contractor's own organization (23 CFR 635.116).

a. The term "perform work with its own organization" refers to workers employed or leased by the prime contractor, and equipment owned or rented by the prime contractor, with or without operators. Such term does not include employees or equipment of a subcontractor or lower tier subcontractor, agents of the prime contractor, or any other assignees. The term may include payments for the costs of hiring leased employees from an employee leasing firm meeting all relevant Federal and State regulatory requirements. Leased employees may only be included in this term if the prime contractor meets all of the following conditions:

(1) the prime contractor maintains control over the supervision of the day-to-day activities of the leased employees;

(2) the prime contractor remains responsible for the quality of the work of the leased employees;

(3) the prime contractor retains all power to accept or exclude individual employees from work on the project; and

(4) the prime contractor remains ultimately responsible for the payment of predetermined minimum wages, the submission of payrolls, statements of compliance and all other Federal regulatory requirements.

b. "Specialty Items" shall be construed to be limited to work that requires highly specialized knowledge, abilities, or equipment not ordinarily available in the type of contracting organizations qualified and expected to bid or propose on the contract as a whole and in general are to be limited to minor components of the overall contract.

2. The contract amount upon which the requirements set forth in paragraph (1) of Section VI is computed includes the cost of material and manufactured products which are to be purchased or produced by the contractor under the contract provisions.

3. The contractor shall furnish (a) a competent superintendent or supervisor who is employed by the firm, has full authority to direct performance of the work in accordance with the contract requirements, and is in charge of all construction operations (regardless of who performs the work) and (b) such other of its own organizational resources (supervision, management, and engineering services) as the contracting officer determines is necessary to assure the performance of the contract.

4. No portion of the contract shall be sublet, assigned or otherwise disposed of except with the written consent of the contracting officer, or authorized representative, and such consent when given shall not be construed to relieve the contractor of any responsibility for the fulfillment of the contract. Written consent will be given only after the contracting agency has assured that each subcontract is

evidenced in writing and that it contains all pertinent provisions and requirements of the prime contract.

5. The 30% self-performance requirement of paragraph (1) is not applicable to design-build contracts; however, contracting agencies may establish their own self-performance requirements.

VII. SAFETY: ACCIDENT PREVENTION

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

1. In the performance of this contract the contractor shall comply with all applicable Federal, State, and local laws governing safety, health, and sanitation (23 CFR 635). The contractor shall provide all safeguards, safety devices and protective equipment and take any other needed actions as it determines, or as the contracting officer may determine, to be reasonably necessary to protect the life and health of employees on the job and the safety of the public and to protect property in connection with the performance of the work covered by the contract.

2. It is a condition of this contract, and shall be made a condition of each subcontract, which the contractor enters into pursuant to this contract, that the contractor and any subcontractor shall not permit any employee, in performance of the contract, to work in surroundings or under conditions which are unsanitary, hazardous or dangerous to his/her health or safety, as determined under construction safety and health standards (29 CFR 1926) promulgated by the Secretary of Labor, in accordance with Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 3704).

3. Pursuant to 29 CFR 1926.3, it is a condition of this contract that the Secretary of Labor or authorized representative thereof, shall have right of entry to any site of contract performance to inspect or investigate the matter of compliance with the construction safety and health standards and to carry out the duties of the Secretary under Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C.3704).

VIII. FALSE STATEMENTS CONCERNING HIGHWAY PROJECTS

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

In order to assure high quality and durable construction in conformity with approved plans and specifications and a high degree of reliability on statements and representations made by engineers, contractors, suppliers, and workers on Federal-aid highway projects, it is essential that all persons concerned with the project perform their functions as carefully, thoroughly, and honestly as possible. Willful falsification, distortion, or misrepresentation with respect to any facts related to the project is a violation of Federal law. To prevent any misunderstanding regarding the seriousness of these and similar acts, Form FHWA-1022 shall be posted on each Federal-aid highway project (23 CFR 635) in one or more places where it is readily available to all persons concerned with the project:

18 U.S.C. 1020 reads as follows:

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

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

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

Shall be fined under this title or imprisoned not more than 5 years or both."

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

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

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

1. That any person who is or will be utilized in the performance of this contract is not prohibited from receiving an award due to a violation of Section 508 of the Clean Water Act or Section 306 of the Clean Air Act.
2. That the contractor agrees to include or cause to be included the requirements of paragraph (1) of this Section X in every subcontract, and further agrees to take such action as the contracting agency may direct as a means of enforcing such requirements.

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

This provision is applicable to all Federal-aid construction contracts, design-build contracts, subcontracts, lower-tier subcontracts, purchase orders, lease agreements, consultant contracts or any other covered transaction requiring FHWA approval or that is estimated to cost \$25,000 or more – as defined in 2 CFR Parts 180 and 1200.

1. Instructions for Certification – First Tier Participants:

- a. By signing and submitting this proposal, the prospective first tier participant is providing the certification set out below.
- b. The inability of a person to provide the certification set out below will not necessarily result in denial of participation in this

covered transaction. The prospective first tier participant shall submit an explanation of why it cannot provide the certification set out below. The certification or explanation will be considered in connection with the department or agency's determination whether to enter into this transaction. However, failure of the prospective first tier participant to furnish a certification or an explanation shall disqualify such a person from participation in this transaction.

c. The certification in this clause is a material representation of fact upon which reliance was placed when the contracting agency determined to enter into this transaction. If it is later determined that the prospective participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the contracting agency may terminate this transaction for cause of default.

d. The prospective first tier participant shall provide immediate written notice to the contracting agency to whom this proposal is submitted if any time the prospective first tier participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.

e. The terms "covered transaction," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 CFR Parts 180 and 1200. "First Tier Covered Transactions" refers to any covered transaction between a grantee or subgrantee of Federal funds and a participant (such as the prime or general contract). "Lower Tier Covered Transactions" refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). "First Tier Participant" refers to the participant who has entered into a covered transaction with a grantee or subgrantee of Federal funds (such as the prime or general contractor). "Lower Tier Participant" refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

f. The prospective first tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency entering into this transaction.

g. The prospective first tier participant further agrees by submitting this proposal that it will include the clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transactions," provided by the department or contracting agency, entering into this covered transaction, without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the \$25,000 threshold.

h. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the Excluded Parties List System website (<https://www.epls.gov/>), which is compiled by the General Services Administration.

i. Nothing contained in the foregoing shall be construed to require the establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of the prospective participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

j. Except for transactions authorized under paragraph (f) of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause or default.

2. Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion – First Tier Participants:

a. The prospective first tier participant certifies to the best of its knowledge and belief, that it and its principals:

(1) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency;

(2) Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;

(3) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph (a)(2) of this certification; and

(4) Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default.

b. Where the prospective participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

2. Instructions for Certification - Lower Tier Participants:

(Applicable to all subcontracts, purchase orders and other lower tier transactions requiring prior FHWA approval or estimated to cost \$25,000 or more - 2 CFR Parts 180 and 1200)

a. By signing and submitting this proposal, the prospective lower tier is providing the certification set out below.

b. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department, or agency with which

this transaction originated may pursue available remedies, including suspension and/or debarment.

c. The prospective lower tier participant shall provide immediate written notice to the person to which this proposal is submitted if at any time the prospective lower tier participant learns that its certification was erroneous by reason of changed circumstances.

d. The terms "covered transaction," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 CFR Parts 180 and 1200. You may contact the person to which this proposal is submitted for assistance in obtaining a copy of those regulations. "First Tier Covered Transactions" refers to any covered transaction between a grantee or subgrantee of Federal funds and a participant (such as the prime or general contract). "Lower Tier Covered Transactions" refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). "First Tier Participant" refers to the participant who has entered into a covered transaction with a grantee or subgrantee of Federal funds (such as the prime or general contractor). "Lower Tier Participant" refers to any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

e. The prospective lower tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency with which this transaction originated.

f. The prospective lower tier participant further agrees by submitting this proposal that it will include this clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction," without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the \$25,000 threshold.

g. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the Excluded Parties List System website (<https://www.epls.gov/>), which is compiled by the General Services Administration.

h. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

i. Except for transactions authorized under paragraph e of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the

department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion--Lower Tier Participants:

1. The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency.

2. Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

XI. CERTIFICATION REGARDING USE OF CONTRACT FUNDS FOR LOBBYING

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts which exceed \$100,000 (49 CFR 20).

1. The prospective participant certifies, by signing and submitting this bid or proposal, to the best of his or her knowledge and belief, that:

a. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

b. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

2. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31 U.S.C. 1352. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

3. The prospective participant also agrees by submitting its bid or proposal that the participant shall require that the language of this certification be included in all lower tier subcontracts, which exceed \$100,000 and that all such recipients shall certify and disclose accordingly.

AA

8 PROSECUTION AND PROGRESS

10-19-12

Replace "working days" in the 1st paragraph of section 8-1.02B(1) with:

original working days

10-19-12

Replace "working days" at each occurrence in the 1st paragraph of section 8-1.02C(1) with:

original working days

10-19-12

Delete the 4th paragraph of section 8-1.02C(1).

04-20-12

Replace "Contract" in the 9th paragraph of section 8-1.02C(1) with:

work

10-19-12

Replace the 1st paragraph of section 8-1.02C(3)(a) with:

Submit a description of your proposed schedule software for authorization.

04-20-12

Delete the last paragraph of section 8-1.02C(3)(a).

04-20-12

Replace section 8-1.02C(3)(b) with:

8-1.02C(3)(b) Reserved

10-19-12

Delete the 3rd paragraph of section 8-1.02C(5).

04-20-12

Replace "Contract" in the last paragraph of section 8-1.02C(5) with:

original

10-19-12

Replace "working days" in the 1st paragraph of section 8-1.02D(1) with:

original working days

10-19-12

Replace "8-1.02D(1)" in the 2nd paragraph of section 8-1.02D(1) with:

8-1.02C(1)

01-20-12

Replace "Contract" in the 3rd paragraph of section 8-1.02D(2) with:

10-19-12

work

Replace "Contract" in item 9 in the list in the 4th paragraph of section 8-1.02D(4) with:

10-19-12

work

Replace "Contract completion" in the 4th paragraph of section 8-1.02D(6) with:

10-19-12

work completion

Replace "Contract working days" in the 4th paragraph of section 8-1.02D(6) with:

10-19-12

original working days

Delete items 1.3 and 1.4 in the list in the 1st paragraph of section 8-1.02D(10).

04-20-12

Replace the last paragraph of section 8-1.04B with:

10-19-12

The Department does not adjust time for starting before receiving notice of Contract approval.

Replace the 1st paragraph of section 8-1.05 with:

10-19-12

Contract time starts on the last day specified to start job site activities in section 8-1.04 or on the day you start job site activities, whichever occurs first.

Replace the 2nd paragraph of section 8-1.05 with:

10-19-12

Complete the work within the Contract time.

Delete "unless the Contract is suspended for reasons unrelated to your performance" in the 4th paragraph of section 8-1.05.

10-19-12

Replace the headings and paragraphs in section 8-1.06 with:

10-19-12

The Engineer may suspend work wholly or in part due to conditions unsuitable for work progress. Provide for public safety and a smooth and unobstructed passageway through the work zone during the suspension as specified under sections 7-1.03 and 7-1.04. Providing the passageway is force account work. The Department makes a time adjustment for the suspension due to a critical delay.

The Engineer may suspend work wholly or in part due to your failure to (1) fulfill the Engineer's orders, (2) fulfill a Contract part, or (3) perform weather-dependent work when conditions are favorable so that weather-related unsuitable conditions are avoided or do not occur. The Department may provide for a

| Cost | Percent markup |
|------------------|----------------|
| Labor | 30 |
| Materials | 10 |
| Equipment rental | 10 |

Delete ", Huntington Beach," in the 3rd paragraph of section 9-1.07A.

04-20-12

Replace the formula in section 9-1.07B(2) with:

$$Qh = HMATT \times Xa$$

04-20-12

Replace "weight of dry aggregate" in the definition of the variable *Xa* in section 9-1.07B(2) with:

total weight of HMA

04-20-12

Replace the formula in section 9-1.07B(3) with:

$$Qrh = RHMATT \times 0.80 \times Xarb$$

04-20-12

Replace "weight of dry aggregate" in the definition of the variable *Xarb* in section 9-1.07B(3) with:

total weight of rubberized HMA

04-20-12

Replace the heading of section 9-1.07B(4) with:

Hot Mix Asphalt with Modified Asphalt Binder

04-20-12

Add between "in" and "modified" in the introductory clause of section 9-1.07B(4):

HMA with

04-20-12

Replace the formula in section 9-1.07B(4) with:

$$Qmh = MHMATT \times [(100 - Xam) / 100] \times Xmab$$

04-20-12

Replace "weight of dry aggregate" in the definition of the variable *Xmab* in section 9-1.07B(4) with:

total weight of HMA

04-20-12

Replace the formula in section 9-1.07B(5) with:

$$Qrap = HMATT \times Xaa$$

04-20-12

Replace "weight of dry aggregate" in the definitions of the variables *Xaa* and *Xta* in section 9-1.07B(5) with:

04-20-12

total weight of HMA

Add after the variable definitions in section 9-1.07B(9):

04-20-12

The quantity of extender oil is included in the quantity of asphalt.

Replace the headings and paragraphs in section 9-1.11 with:

10-19-12

9-1.11A General

Section 9-1.11 applies if a bid item for time-related overhead is included in the Contract. If a bid item for time-related overhead is included, you must exclude the time-related overhead from every other bid item price.

9-1.11B Payment Quantity

The TRO quantity does not include the number of working days to complete plant establishment work.

For a contract with a TRO lump sum quantity on the Bid Item List, the Department pays you based on the following conversions:

1. LS unit of measure is replaced with WDAY
2. Lump sum quantity is replaced with the number of working days bid
3. Lump sum unit price is replaced with the item total divided by the number of working days bid

9-1.11C Payment Inclusions

Payment for the TRO bid item includes payment for time-related field- and home-office overhead for the time required to complete the work.

The field office overhead includes time-related expenses associated with the normal and recurring construction activities not directly attributed to the work, including:

1. Salaries, benefits, and equipment costs of:
 - 1.1. Project managers
 - 1.2. General superintendents
 - 1.3. Field office managers
 - 1.4. Field office staff assigned to the project
2. Rent
3. Utilities
4. Maintenance
5. Security
6. Supplies
7. Office equipment costs for the project's field office

The home-office overhead includes the fixed general and administrative expenses for operating your business, including:

1. General administration
2. Insurance
3. Personnel and subcontract administration
4. Purchasing
5. Accounting
6. Project engineering and estimating

Payment for the TRO bid item does not include payment for:

1. The home-office overhead expenses specifically related to:
 - 1.1. Your other contracts or other businesses
 - 1.2. Equipment coordination
 - 1.3. Material deliveries
 - 1.4. Consultant and legal fees
2. Non-time-related costs and expenses such as mobilization, licenses, permits, and other charges incurred once during the Contract
3. Additional overhead involved in incentive/disincentive provisions to satisfy an internal milestone or multiple calendar requirements
4. Additional overhead involved in performing additional work that is not a controlling activity
5. Overhead costs incurred by your subcontractors of any tier or suppliers

9-1.11D Payment Schedule

For progress payments, the total work completed for the TRO bid item is the number of working days shown for the pay period on the *Weekly Statement of Working Days*.

For progress payments, the Department pays a unit price equal to the lesser of the following amounts:

1. Price per working day as bid or as converted under section 9-1.11B.
2. 20 percent of the total bid divided by the number of original working days

For a contract without plant establishment work, the Department pays you the balance due of the TRO item total as specified in section 9-1.17B.

For a contract with plant establishment work, the Department pays you the balance due of the TRO item total in the 1st progress payment after all non-plant establishment work is completed.

9-1.11E Payment Adjustments

The 3rd paragraph of section 9-1.17C does not apply.

The Department does not adjust the unit price for an increase or decrease in the TRO quantity except as specified in section 9-1.11E.

Section 9-1.17D(2)(b) does not apply except as specified for the audit report below.

If the TRO bid item quantity exceeds 149 percent of the quantity shown on the Bid Item List or as converted under section 9-1.11B, the Engineer may adjust or you may request an adjustment of the unit price for the excess quantity. For the adjustment, submit an audit report within 60 days of the Engineer's request. The report must be prepared as specified for an audit report for an overhead claim in section 9-1.17D(2)(b).

Within 20 days of the Engineer's request, make your financial records available for an audit by the State for the purpose of verifying the actual rate of TRO described in your audit. The actual rate of TRO described is subject to the Engineer's authorization.

The Department pays the authorized actual rate for TRO in excess of 149 percent of the quantity shown on the Bid Item List or as converted under section 9-1.11B.

The Department pays for 1/2 the cost of the report; the Contractor pays for the other 1/2. The cost is determined under section 9-1.05.

Delete "revised Contract" in item 1 of the 1st paragraph of section 9-1.16E(2).

10-19-12

Replace "2014" in the 1st paragraph of section 9-1.16F with:

10-19-12

2020

Cancel closure requests using LCS at least 48 hours before the time of the closure.

Add between the 7th and 8th paragraphs of section 12-4.03:

10-19-12

The contingency plan must identify the operations, equipment, processes, and materials that may fail and delay a reopening of a closure to traffic. List the additional or alternate equipment, materials, or workers necessary to ensure continuing operations and on-time opening of closures whenever a problem occurs. If the additional or alternate equipment, materials, or workers are not on site, specify their location, the method for mobilizing these items, and the required time to complete mobilization.

Based on the Engineer's review, additional materials, equipment, workers, or time to complete operations from that specified in the contingency plan may be required.

Provide a general time-scaled logic diagram displaying the major activities and sequence of planned operations that comply with the requirements of section 12-4.03. For each operation, identify the critical event when the contingency plan will be activated.

Submit any revisions to the contingency plan for an operation at least 3 business days before starting that operation. Do not close any lanes until the contingency plan has been authorized.

The 5th paragraph of section 5-1.23B(1) does not apply to reviewing contingency plans.

Replace section 12-7 with:

09-16-11

12-7 RESERVED

^^

13 WATER POLLUTION CONTROL

04-19-13

04-19-13

Delete item 3 in the list in the 4th paragraph of section 13-1.01A.

Add to section 13-1.01A:

01-20-12

Comply with the Department's general permit issued by the State Water Resources Control Board for *Order No. 99-06-DWQ, NPDES No. CAS000003, National Pollutant Discharge Elimination System (NPDES) Permit, Statewide Storm Water Permit and Waste Discharge Requirements (WDRs) for the State of California, Department of Transportation (Caltrans)*. The Department's general permit governs stormwater and nonstormwater discharges from the Department's properties, facilities, and activities. The Department's general permit may be viewed at the Web site for the State Water Resources Control Board, Storm Water Program, Caltrans General Permit.

Add to the list in the 1st paragraph of section 13-1.01D(3)(b):

10-21-11

- 3. Have completed SWRCB approved QSD training and passed the QSD exam

Add to the list in the 2nd paragraph of section 13-1.01D(3)(b):

10-21-11

- 3. Have completed SWRCB approved QSP training and passed the QSP exam

Replace "NEL violation" in item 3.6.2 in the list in the 1st paragraph of section 13-1.01D(3)(c) with:

04-19-13

receiving water monitoring trigger

Replace the 1st paragraph in section 13-2.01B with:

04-19-13

Within 7 days after Contract approval, submit 2 copies of your WPCP for review. Allow 5 business days for review.

After the Engineer authorizes the WPCP, submit an electronic copy and 3 printed copies of the authorized WPCP.

If the RWQCB requires review of the authorized WPCP, the Engineer submits the authorized WPCP to the RWQCB for its review and comment. If the Engineer orders changes to the WPCP based on the RWQCB's comments, amend the WPCP within 3 business days.

Replace the 1st paragraph in section 13-3.01B(2)(a) with:

04-19-13

Within 15 days of Contract approval, submit 3 copies of your SWPPP for review. The Engineer provides comments and specifies the date when the review stopped if revisions are required. Change and resubmit a revised SWPPP within 15 days of receiving the Engineer's comments. The Department's review resumes when a complete SWPPP has been resubmitted.

When the Engineer authorizes the SWPPP, submit an electronic copy and 4 printed copies of the authorized SWPPP.

If the RWQCB requires review of the authorized SWPPP, the Engineer submits the authorized SWPPP to the RWQCB for its review and comment. If the Engineer requests changes to the SWPPP based on the RWQCB's comments, amend the SWPPP within 10 days.

Replace "NELs" in item 3.1 in the 3rd paragraph of section 13-3.01B(2)(a) with:

04-19-13

receiving water monitoring triggers

Replace section 13-3.01B(6)(c) with:

04-19-13

13-3.01B(6)(c) Receiving Water Monitoring Trigger Report

Whenever a receiving water monitoring trigger is exceeded, notify the Engineer and submit a receiving water monitoring trigger report within 48 hours after conclusion of a storm event. The report must include:

1. Field sampling results and inspections, including:
 - 1.1. Analytical methods, reporting units, and detection limits
 - 1.2. Date, location, time of sampling, visual observation and measurements
 - 1.3. Quantity of precipitation from the storm event
2. Description of BMPs and corrective actions

Replace "NEL" in the 6th paragraph of section 13-3.01C(1) with:

04-19-13

receiving water monitoring trigger

Replace section 13-3.01C(3) with:

04-19-13

13-3.01C(3) Receiving Water Monitoring Trigger

For a risk level 3 project, receiving water monitoring triggers must comply with the values shown in the following table:

Receiving Water Monitoring Trigger

| Parameter | Test method | Detection limit (min) | Unit | Value |
|-----------|--|-----------------------|------|--|
| pH | Field test with calibrated portable instrument | 0.2 | pH | Lower limit = 6.0 Upper limit = 9.0 |
| Turbidity | Field test with calibrated portable instrument | 1 | NTU | 500 NTU max |

The storm event daily average for storms up to the 5-year, 24-hour storm must not exceed the receiving water monitoring trigger for turbidity.

The daily average sampling results must not exceed the receiving water monitoring trigger for pH.

Delete "and NELs are violated" in the 3rd paragraph of section 13-3.03C.

04-19-13

Replace "working days" at each occurrence in section 13-3.04 with.

original working days

10-19-12

Delete the 1st sentence in the 2nd paragraph of section 13-4.03C(3).

04-19-13

Add between the 2nd and 3rd paragraphs of section 13-4.03C(3):

Manage stockpiles by implementing water pollution control practices on:

1. Active stockpiles before a forecasted storm event
2. Inactive stockpiles according to the WPCP or SWPPP schedule

04-19-13

Replace the paragraph in section 13-4.04 with:

Not Used

04-20-12

Delete "or stockpile" in the 3rd paragraph of section 13-5.02F.

10-19-12

5. Be fastened securely to the existing frame without projections above the surface of the road or into the clear opening

Add to the end of section 15-4.01A(2):

Allow 20 days for review of the bridge removal work plan.

04-19-13

Replace the 1st paragraph of section 15-5.01C(1) with:

Before starting deck rehabilitation activities, complete the removal of any traffic stripes, pavement markings, and pavement markers.

10-19-12

Replace the 2nd and 3rd paragraphs of section 15-5.01C(2) with:

Perform the following activities in the order listed:

10-19-12

1. Abrasive blast the deck surface with steel shot. Perform abrasive blasting after the removal of any unsound concrete and placement of any rapid setting concrete patches.
2. Sweep the deck surface.
3. Blow the deck surface clean using high-pressure air.

Replace the 2nd paragraph of section 15-5.01C(4) with:

Before removing asphalt concrete surfacing, verify the depth of the surfacing at the supports and midspans of each structure (1) in each shoulder, (2) in the traveled way, and (3) at the roadway crown, if a crown is present.

10-19-12

Delete "and concrete expansion dams" in the 3rd paragraph of section 15-5.01C(4).

04-19-13

Replace the 2nd paragraph of section 15-5.03A(2) with:

For a contract with less than 60 original working days, submit certificates of compliance for the filler material and bonding agents.

10-19-12

Replace "51-1.02C" in the 1st paragraph of section 15-5.03B with:

51-1.02F

04-19-13

Replace the 4th paragraph of section 15-5.03B with:

For a contract with less than 60 original working days, alternative materials must be authorized before use.

10-19-12

Add between the 5th and 6th paragraphs of section 15-5.03C:

The final surface finish of the patched concrete surface must comply with section 51-1.03F.

10-19-12

Delete the 4th paragraph of section 15-5.05C.

10-19-12

Replace "51-1.03F(5)" in the 3rd paragraph of section 15-5.06C(1) with:

51-1.01D(4)

10-19-12

Replace "51-1.03E(5)" in the 5th paragraph of section 15-5.06C(1) with:

51-1.03F(5)

10-19-12

Delete the 9th paragraph of section 15-5.06C(1).

10-19-12

Delete the 15th paragraph of section 15-5.06C(1).

04-19-13

Add to section 15-5.06C(1):

Texture the polyester concrete surface before gelling occurs by longitudinal tining under 51-1.03F(5)(b)(iii), except do not perform initial texturing.

10-19-12

Replace section 15-5.06C(2) with:

15-5.06C(2) Reserved

04-19-13

Delete the 3rd paragraph of section 15-5.06D.

04-19-13

Replace the 1st paragraph in section 15-5.07B(4) with:

Payment for furnishing dowels is not included in the payment for core and pressure grout dowel.

10-19-12

Replace section 15-5.09 with:

15-5.09 POLYESTER CONCRETE EXPANSION DAMS

04-19-13

15-5.09A General

Section 15-5.09 includes specifications for constructing polyester concrete expansion dams.

Polyester concrete expansion dams must comply with the specifications for polyester concrete overlays in section 15-5.06, except a trial slab is not required.

Replace "sets" in the 3rd and 4th paragraphs of section 19-3.01A(2)(d) with:

copies

04-19-13

Add to section 19-3.01A(3)(b):

For soil nail walls, wall zones are specified in the special provisions.

01-20-12

For ground anchor walls, a wall zone is the entire wall unless otherwise specified in the special provisions.

Delete the 2nd sentence in the 4th paragraph of section 19-3.01A(3)(b).

01-20-12

Replace "90" in the paragraph of section 19-3.02G with:

90-1

01-18-13

Replace the heading of section 19-3.03C with:

19-3.03B(4) Cofferdams

04-19-13

Replace the heading of section 19-3.03D with:

19-3.03B(5) Water Control and Foundation Treatment

04-19-13

Replace the 1st paragraph of section 19-3.03E(3) with:

Compact structure backfill behind lagging of soldier pile walls by hand tamping, mechanical compaction, or other authorized means.

01-20-12

Replace the 2nd paragraph of section 19-3.03F with:

Do not backfill over or place material over slurry cement backfill until 4 hours after placement. When concrete sand is used as aggregate and the in-place material is free draining, you may start backfilling as soon as the surface water is gone.

01-20-12

Add between the 2nd and 3rd paragraphs of section 19-3.03K:

Before you excavate for the installation of ground anchors in a wall zone:

01-20-12

1. Complete stability testing
2. Obtain authorization of test data

- 2. Paving construction foreman
- 3. Traffic control foreman

Be prepared to discuss:

- 1. Quality control
- 2. Acceptance testing
- 3. Placement
- 4. Training on placement methods
- 5. Checklist of items for proper placement
- 6. Unique issues specific to the project, including:
 - 6.1. Weather
 - 6.2. Alignment and geometrics
 - 6.3. Traffic control issues
 - 6.4. Haul distances
 - 6.5. Presence and absence of shaded areas
 - 6.6. Any other local issues

37-1.02 MATERIALS

Not Used

37-1.03 CONSTRUCTION

Not Used

37-1.04 PAYMENT

Not Used

Replace "Reserved" in section 37-2.01D(1) with:

01-18-13

Aggregate suppliers, chip spreader operators, emulsion distributor, and for coated chips, the coated chips producer must attend the prepaving conference.

Add to section 37-2.03A:

04-20-12

If you fail to place the permanent traffic stripes and pavement markings within the specified time, the Department withholds 50 percent of the estimated value of the seal coat work completed that has not received permanent traffic stripes and pavement markings.

Add to section 37-3.01D(1):

01-18-13

Micro-surfacing spreader operators must attend the prepaving conference.

AA

39 HOT MIX ASPHALT

02-22-13

Add to section 39-1.01B:

02-22-13

processed RAP: RAP that has been fractionated.

substitution rate: Amount of RAP aggregate substituted for virgin aggregate in percent.

binder replacement: Amount of RAP binder in OBC in percent.

surface course: Upper 0.2 feet of HMA exclusive of OGFC.

Add to the end of the paragraph in section 39-1.02A:

10-19-12

as shown

Replace the paragraphs in section 39-1.02F with:

02-22-13

39-1.02F(1) General

You may produce HMA Type A or B using RAP. HMA produced using RAP must comply with the specifications for HMA, except aggregate quality specifications do not apply to RAP. You may substitute RAP at a substitution rate not exceeding 25 percent of the aggregate blend. Do not use RAP in OGFC and RHMA-G.

Assign the substitution rate of RAP aggregate for virgin aggregate with the JMF submittal. The JMF must include the percent of RAP used.

Provide enough space for meeting RAP handling requirements at your facility. Provide a clean, graded, well-drained area for stockpiles. Prevent material contamination and segregation.

If RAP is from multiple sources, blend the RAP thoroughly and completely. RAP stockpiles must be homogeneous.

Isolate the processed RAP stockpiles from other materials. Store processed RAP in conical or longitudinal stockpiles. Processed RAP must not be agglomerated or be allowed to congeal in large stockpiles.

AASHTO T 324 (Modified) is AASHTO T 324, "Hamburg Wheel-Track Testing of Compacted Hot Mix Asphalt (HMA)," with the following parameters:

1. Target air voids must equal 7 ± 1 percent
2. Number of test specimens must be 4
3. Test specimen must be a 6-inch gyratory compacted specimen
4. Test temperature must be set at 140 ± 2 degrees F
5. Measurements for impression must be taken at every 100 passes
6. Inflection point defined as the number of wheel passes at the intersection of the creep slope and the stripping slope
7. Testing shut off must be set at 25,000 passes

39-1.02F(2) Substitution Rate of 15 Percent or Less

For a RAP substitution rate of 15 percent or less, you may stockpile RAP during the entire project.

39-1.02F(3) Substitution Rate Greater than 15 Percent

For a RAP substitution rate greater than 15 percent, fractionate RAP into 2 sizes, a coarse fraction RAP retained on 1/4-inch screen and a fine fraction RAP passing 1/4-inch screen.

Sample and test processed RAP at a minimum frequency of 1 sample per 1000 tons with a minimum of 6 samples for each processed RAP stockpile. The asphalt binder content and specific gravity must meet the processed RAP quality characteristics. If a processed RAP stockpile is augmented, sample and test processed RAP quality characteristics at a minimum frequency of 1 sample per 500 tons of augmented RAP.

The processed RAP asphalt binder content must be within ± 2.0 percent of the average processed RAP stockpile asphalt binder content when tested under ASTM D 2172, Method B. If a new processed RAP stockpile is required, the average binder content of the new processed RAP stockpile must be within ± 2.0 percent of the average binder content of the original processed RAP stockpile.

The maximum specific gravity for processed RAP must be within ± 0.06 when tested under California Test 309 of the average maximum specific gravity reported on page 4 of your *Contractor Hot Mix Asphalt Design Data* form.

Replace "less than 10 percent" in note "b" in the table in the 5th paragraph of section 39-1.02E with:

01-20-12

10 percent or less

Replace items 7 and 8 in the 5th paragraph of section 39-1.03A with:

02-22-13

7. Substitution rate by more than 5 percent if your assigned RAP substitution rate is 15 percent or less
8. Substitution rate by more than 3 percent if your assigned RAP substitution rate is greater than 15 percent
9. Average binder content by more than 2 percent from the average binder content of the original processed RAP stockpile used in the mix design
10. Maximum specific gravity of processed RAP by more than ± 0.060 from the average maximum specific gravity of processed RAP reported on page 4 of your *Contractor Hot Mix Asphalt Design Data* form
11. Any material in the JMF

Replace the 1st paragraph of section 39-1.03B with:

02-22-13

Perform a mix design that produces HMA with the values for the quality characteristics shown in the following table:

HMA Mix Design Requirements

| Quality characteristic | Test method | HMA type | | |
|--|---------------------|-----------|-----------|------------------|
| | | A | B | RHMA-G |
| Air void content (%) | California Test 367 | 4.0 | 4.0 | Section 39-1.03B |
| Voids in mineral aggregate (% min.) No. 4 grading 3/8" grading 1/2" grading 3/4" grading | California Test 367 | 17.0 | 17.0 | -- |
| | | 15.0 | 15.0 | -- |
| | | 14.0 | 14.0 | 18.0–23.0 |
| | | 13.0 | 13.0 | 18.0–23.0 |
| Voids filled with asphalt (%) No. 4 grading 3/8" grading 1/2" grading 3/4" grading | California Test 367 | 65.0–75.0 | 65.0–75.0 | Note a |
| | | 65.0–75.0 | 65.0–75.0 | |
| | | 65.0–75.0 | 65.0–75.0 | |
| | | 65.0–75.0 | 65.0–75.0 | |
| Dust proportion No. 4 and 3/8" gradings 1/2" and 3/4" gradings | California Test 367 | 0.6–1.2 | 0.6–1.2 | Note a |
| | | 0.6–1.2 | 0.6–1.2 | |
| Stabilometer value (min.) No. 4 and 3/8" gradings 1/2" and 3/4" gradings | California Test 366 | 30 | 30 | -- |
| | | 37 | 35 | 23 |

^a Report this value in the JMF submittal.

For RAP substitution rate greater than 15 percent, the mix design must comply with the additional quality characteristics shown in the following table:

**Additional HMA Mix Design Requirements
for RAP Substitution Rate Greater Than 15 Percent**

| Quality characteristic | Test method | HMA type | | |
|--|--|----------|--------|--------|
| | | A | B | RHMA-G |
| Hamburg wheel track (minimum number of passes at 0.5 inch average rut depth) | AASHTO T 324 (Modified) ^a | | | |
| PG-58 | | 10,000 | 10,000 | -- |
| PG-64 | | 15,000 | 15,000 | |
| PG-70 | | 20,000 | 20,000 | |
| PG-76 or higher | | 25,000 | 25,000 | |
| Hamburg wheel track (inflection point minimum number of passes) | AASHTO T 324 (Modified) ^a | | | |
| PG-58 | | 10,000 | 10,000 | -- |
| PG-64 | | 10,000 | 10,000 | |
| PG-70 | | 12,500 | 12,500 | |
| PG-76 or higher | | 15000 | 15000 | |
| Moisture susceptibility (minimum dry strength, psi) | California Test 371 ^a | 120 | 120 | -- |
| Moisture susceptibility (tensile strength ration, %) | California Test 371 ^a | 70 | 70 | -- |

^aTest plant produced HMA.

For HMA with RAP, the maximum binder replacement must be 25.0 percent of OBC for surface course and 40.0 percent of OBC for lower courses.

For HMA with a binder replacement less than or equal to 25 percent of OBC, you may request that the PG asphalt binder grade with upper and lower temperature classifications be reduced by 6 degrees C from the specified grade.

For HMA with a binder replacement greater than 25 percent but less than or equal to 40 percent of OBC, you must use a PG asphalt binder grade with upper and lower temperature classifications reduced by 6 degrees C from the specified grade.

Replace item 4 in the list in the 1st paragraph of section 39-1.03C with:

4. JMF renewal on a *Caltrans Job Mix Formula Renewal* form, if applicable

01-20-12

Add after the last paragraph of section 39-1.03C:

For RAP substitution rate greater than 15 percent, submit with the JMF submittal:

1. California Test 371 tensile strength ratio and minimum dry strength test results
2. AASHTO T 324 (Modified) test results

02-22-13

For RAP substitution rate greater than 15 percent, submit California Test 371 and AASHTO T 324 (Modified) test results to the Engineer and to:

Moisture_Tests@dot.ca.gov

Replace the 2nd paragraph of section 39-1.03E with:

04-20-12

Use the OBC specified on your *Contractor Hot Mix Asphalt Design Data* form. No adjustments to asphalt binder content are allowed. Based on your testing and production experience, you may submit an adjusted aggregate gradation TV on a *Contractor Job Mix Formula Proposal* form before verification testing. Aggregate gradation TV must be within the TV limits specified in the aggregate gradation tables.

Add between the 3rd and 4th paragraphs of section 39-1.03E:

04-20-12

Asphalt binder set point for HMA must be the OBC specified on your *Contractor Hot Mix Asphalt Design Data* form. When RAP is used, asphalt binder set point for HMA must be:

$$\text{Asphalt Binder Set Point} = \frac{\frac{BC_{OBC}}{\left(1 - \frac{BC_{OBC}}{100}\right)} - R_{RAP} \left[\frac{BC_{RAP}}{\left(1 - \frac{BC_{RAP}}{100}\right)} \right]}{100 + \frac{BC_{OBC}}{\left(1 - \frac{BC_{OBC}}{100}\right)}}$$

Where:

BC_{OBC} = optimum asphalt binder content, percent based on total weight of mix

R_{RAP} = RAP ratio by weight of aggregate

BC_{RAP} = asphalt binder content of RAP, percent based on total weight of RAP mix

Replace item 4 in the list in the 8th paragraph of section 39-1.03E with:

04-20-12

4. HMA quality specified in the table titled "HMA Mix Design Requirements" except:
 - 4.1. Air void content, design value ± 2.0 percent
 - 4.2. Voids filled with asphalt, report only
 - 4.3. Dust proportion, report only

Replace the 12th paragraph of section 39-1.03E with:

04-20-12

If tests on plant-produced samples do not verify the JMF, the Engineer notifies you and you must submit a new JMF or submit an adjusted JMF based on your testing. JMF adjustments may include a change in aggregate gradation TV within the TV limits specified in the aggregate gradation tables.

Replace the 14th paragraph of section 39-1.03E with:

01-20-12

A verified JMF is valid for 12 months.

Replace the last sentence in the 15th paragraph of section 39-1.03E with:

01-20-12

This deduction does not apply to verifications initiated by the Engineer or JMF renewal.

Replace the 16th paragraph of section 39-1.03E with:

02-22-13

Except for RAP substitution rate greater than 15 percent, for any HMA produced under the QC/QA process the Department does not use California Test 371 test results for verification.

Add between the 1st and 2nd paragraphs of section 39-1.03F:

04-20-12

Target asphalt binder content on your Contractor *Job Mix Formula Proposal* form and the OBC specified on your *Contractor Hot Mix Asphalt Design Data* form must be the same.

Delete the 4th paragraph of section 39-1.03F.

01-20-12

Replace items 3 and 5 in the list in the 6th paragraph of section 39-1.03F with:

01-20-12

3. Engineer verifies each proposed JMF renewal within 20 days of receiving verification samples.
5. For each HMA type and aggregate gradation specified, the Engineer verifies at the Department's expense 1 proposed JMF renewal within a 12-month period.

Add between the 6th and 7th paragraphs of section 39-1.03F:

01-20-12

The most recent aggregate quality test results within the past 12 months may be used for verification of JMF renewal or the Engineer may perform aggregate quality tests for verification of JMF renewal.

Replace section 39-1.03G with:

04-20-12

39-1.03G Job Mix Formula Modification

For an accepted JMF, you may change asphalt binder source one time during production.

Submit your modified JMF request a minimum of 3 business days before production. Each modified JMF submittal must consist of:

1. Proposed modified JMF on *Contractor Job Mix Formula Proposal* form
2. Mix design records on *Contractor Hot Mix Asphalt Design Data* form for the accepted JMF to be modified
3. JMF verification on *Hot Mix Asphalt Verification* form for the accepted JMF to be modified
4. Quality characteristics test results for the modified JMF as specified in section 39-1.03B. Perform tests at the mix design OBC as shown on the *Contractor Asphalt Mix Design Data* form
5. If required, California Test 371 test results for the modified JMF.

With an accepted modified JMF submittal, the Engineer verifies each modified JMF within 5 business days of receiving all verification samples. If California Test 371 is required, the Engineer tests for California Test 371 within 10 days of receiving verification samples.

The Engineer verifies the modified JMF after the modified JMF HMA is placed on the project and verification samples are taken within the first 750 tons following sampling requirements in section 39-1.03E, "Job Mix Formula Verification." The Engineer tests verification samples for compliance with:

1. Stability as shown in the table titled "HMA Mix Design Requirements"
2. Air void content at design value ± 2.0 percent
3. Voids in mineral aggregate as shown in the table titled "HMA Mix Design Requirements"
4. Voids filled with asphalt, report only

5. Dust proportion, report only

If the modified JMF is verified, the Engineer revises your *Hot Mix Asphalt Verification* form to include the new asphalt binder source. Your revised form will have the same expiration date as the original form.

If a modified JMF is not verified, stop production and any HMA placed using the modified JMF is rejected.

The Engineer deducts \$2,000 from payments for each modified JMF verification. The Engineer deducts an additional \$2,000 for each modified JMF verification that requires California Test 371.

Add to section 39-1.03:

01-20-12

39-1.03H Job Mix Formula Acceptance

You may start HMA production if:

1. The Engineer's review of the JMF shows compliance with the specifications.
2. The Department has verified the JMF within 12 months before HMA production.
3. The Engineer accepts the verified JMF.

Replace "3 days" in the 1st paragraph of section 39-1.04A with:

01-20-12

3 business days

Replace the 2nd sentence in the 2nd paragraph of section 39-1.04A with:

01-20-12

During production, take samples under California Test 125. You may sample HMA from:

Replace the 2nd paragraph of section 39-1.04E with:

02-22-13

For RAP substitution rate of 15 percent or less, sample RAP once daily.

For RAP substitution rate of greater than 15percent, sample processed RAP twice daily.

Perform QC testing for processed RAP aggregate gradation under California Test 367, appendix B, and submit the results with the combined aggregate gradation.

Replace "5 days" in the 1st paragraph of section 39-1.06 with:

01-20-12

5 business days

Replace the 3rd paragraph of section 39-1.08A with:

04-20-12

During production, you may adjust hot or cold feed proportion controls for virgin aggregate and RAP.

Add to section 39-1.08A:

04-20-12

During production, asphalt binder set point for HMA Type A, HMA Type B, HMA Type C, and RHMA-G must be the OBC shown in *Contractor Hot Mix Asphalt Design Data* form. For OGFC, asphalt binder set

point must be the OBC shown on *Caltrans Hot Mix Asphalt Verification* form. If RAP is used, asphalt binder set point for HMA must be calculated as specified in section 39-1.03E.

02-22-13

For RAP substitution rate of 15 percent or less, you may adjust the RAP by ± 5 percent.

For RAP substitution greater than 15, you may adjust the RAP by ± 3 percent.

04-20-12

You must request adjustments to the plant asphalt binder set point based on new RAP stockpiles average asphalt binder content. Do not adjust the HMA plant asphalt binder set point until authorized.

Replace the 3rd paragraph of section 39-1.08B with:

09-16-11

Asphalt rubber binder must be from 375 to 425 degrees F when mixed with aggregate.

Replace section 39-1.11 with:

01-18-13

39-1.11 CONSTRUCTION

39-1.11A General

Do not place HMA on wet pavement or a frozen surface.

You may deposit HMA in a windrow and load it in the paver if:

1. Paver is equipped with a hopper that automatically feeds the screed
2. Loading equipment can pick up the windrowed material and deposit it in the paver hopper without damaging base material
3. Activities for deposit, pickup, loading, and paving are continuous
4. HMA temperature in the windrow does not fall below 260 degrees F

You may place HMA in 1 or more layers on areas less than 5 feet wide and outside the traveled way, including shoulders. You may use mechanical equipment other than a paver for these areas. The equipment must produce uniform smoothness and texture.

HMA handled, spread, or windrowed must not stain the finished surface of any improvement, including pavement.

Do not use petroleum products such as kerosene or diesel fuel to release HMA from trucks, spreaders, or compactors.

HMA must be free of:

1. Segregation
2. Coarse or fine aggregate pockets
3. Hardened lumps

39-1.11B Longitudinal Joints

39-1.11B(1) General

Longitudinal joints in the top layer must match specified lane edges. Alternate the longitudinal joint offsets in the lower layers at least 0.5 foot from each side of the specified lane edges. You may request other longitudinal joint placement patterns.

A vertical longitudinal joint of more than 0.15 ft is not allowed at any time between adjacent lanes open to traffic.

For HMA thickness of 0.15 ft or less, the distance between the ends of the adjacent surfaced lanes at the end of each day's work must not be greater than can be completed in the following day of normal paving.

For HMA thickness greater than 0.15 ft, you must place HMA on adjacent traveled way lanes so that at the end of each work shift the distance between the ends of HMA layers on adjacent lanes is from 5 to 10 feet. Place additional HMA along the transverse edge at each lane's end and along the exposed longitudinal edges between adjacent lanes. Hand rake and compact the additional HMA to form temporary conforms. You may place Kraft paper or another authorized bond breaker under the conform tapers to facilitate the taper removal when paving operations resume.

39-1.11B(2) Tapered Notched Wedge

For divided highways with an HMA lift thickness greater than 0.15 foot, you may construct a 1-foot wide tapered notched wedge joint as a longitudinal joint between adjacent lanes open to traffic. A vertical notch of 0.75 inch maximum must be placed at the top and bottom of the tapered wedge.

The tapered notched wedge must retain its shape while exposed to traffic. Pave the adjacent lane within 1 day.

Construct the tapered portion of the tapered notched wedge with an authorized strike-off device. The strike-off device must provide a uniform slope and must not restrict the main screed of the paver.

You may use a device attached to the screed to construct longitudinal joints that will form a tapered notched wedge in a single pass. The tapered notched wedge must be compacted to a minimum of 91 percent compaction.

Perform QC testing on the completed tapered notch wedge joint as follows:

1. Perform field compaction tests at the rate of 1 test for each 750-foot section along the joint. Select random locations for testing within each 750-foot section.
2. Perform field compaction tests at the centerline of the joint, 6 inches from the upper vertical notch, after the adjacent lane is placed and before opening the pavement to traffic.
3. Determine maximum density test results.
4. Determine percent compaction of the longitudinal joint as the ratio of the average of the field compaction values and the maximum density test results.

For HMA under QC/QA construction process, the additional quality control compaction results associated with the tapered notch wedge will not be included in the computation of any quality factor and process control.

For acceptance of the completed tapered notch wedge joint, take two 4- or 6-inch diameter cores 6 inches from the upper vertical notch of the completed longitudinal joint for every 3,000 feet at locations designated by the Engineer. Take cores after the adjacent lane is placed and before opening the pavement to traffic. Cores must be taken in the presence of the Engineer and must be marked to identify the test sites. Submit the cores. One core will be used for determination of the field density and 1 core will be used for dispute resolution. The Engineer determines:

1. Field compaction by measuring the bulk specific gravity of the cores under California Test 308, Method A
2. Percent compaction as the ratio of the average of the bulk specific gravity of the core for each day's production to the maximum density test value

For HMA under QC/QA construction process, the additional quality assurance testing by the Engineer to determine field compaction associated with the tapered notch wedge will not be included in the Engineer's verification testing and in the computation of any quality factor and process control.

Determine percent compaction values each day the joint is completed and submit values within 24 hours of testing. If the percent compaction of 1 day's production is less than 91 percent, that day's notched wedge joint is rejected. Discontinue placement of the tapered notched wedge and notify the Engineer of changes you will make to your construction process in order to meet the specifications.

For HMA under QC/QA construction process, quantities of HMA placed in the completed longitudinal joint will have a quality factor QF_{QC5} of 1.0.

39-1.11C Widening Existing Pavement

If widening existing pavement, construct new pavement structure to match the elevation of the existing pavement's edge before placing HMA over the existing pavement.

39-1.11D Shoulders, Medians, and Other Road Connections

Until the adjoining through lane's top layer has been paved, do not pave the top layer of:

1. Shoulders
2. Tapers
3. Transitions
4. Road connections
5. Driveways
6. Curve widenings
7. Chain control lanes
8. Turnouts
9. Turn pockets

If the number of lanes changes, pave each through lane's top layer before paving a tapering lane's top layer. Simultaneous to paving a through lane's top layer, you may pave an adjoining area's top layer, including shoulders. Do not operate spreading equipment on any area's top layer until completing final compaction.

39-1.11E Leveling

If leveling with HMA is specified, fill and level irregularities and ruts with HMA before spreading HMA over the base, existing surfaces, or bridge decks. You may use mechanical equipment other than a paver for these areas. The equipment must produce uniform smoothness and texture. HMA used to change an existing surface's cross slope or profile is not paid for as HMA (leveling).

If placing HMA against the edge of existing pavement, sawcut or grind the pavement straight and vertical along the joint and remove extraneous material.

39-1.11F Compaction

Rolling must leave the completed surface compacted and smooth without tearing, cracking, or shoving. Complete finish rolling activities before the pavement surface temperature is:

1. Below 150 degrees F for HMA with unmodified binder
2. Below 140 degrees F for HMA with modified binder
3. Below 200 degrees F for RHMA-G

If a vibratory roller is used as a finish roller, turn the vibrator off.

Do not use a pneumatic-tired roller to compact RHMA-G.

For Standard and QC/QA construction processes, if 3/4-inch aggregate grading is specified, you may use a 1/2-inch aggregate grading if the specified total paved thickness is at least 0.15 foot and less than 0.20 foot thick.

Spread and compact HMA under sections 39-3.03 and 39-3.04 if any of the following applies:

1. Specified paved thickness is less than 0.15 foot.
2. Specified paved thickness is less than 0.20 foot and 3/4-inch aggregate grading is specified and used.
3. You spread and compact at:
 - 3.1. Asphalt concrete surfacing replacement areas
 - 3.2. Leveling courses
 - 3.3. Areas for which the Engineer determines conventional compaction and compaction measurement methods are impeded

Do not open new HMA pavement to public traffic until its mid-depth temperature is below 160 degrees F.

If you request and if authorized, you may cool HMA Type A and Type B with water when rolling activities are complete. Apply water under section 17-3.

Spread sand at a rate from 1 to 2 lb/sq yd on new RHMA-G, RHMA-O, and RHMA-O-HB pavement when finish rolling is complete. Sand must be free of clay or organic matter. Sand must comply with section 90-1.02C(4)(c). Keep traffic off the pavement until spreading sand is complete.

Replace the 5th and 6th paragraphs of section 39-1.12C with:

07-20-12

On tangents and horizontal curves with a centerline radius of curvature 2,000 feet or more, the PI_0 must be at most 2.5 inches per 0.1-mile section.

On horizontal curves with a centerline radius of curvature between 1,000 feet and 2,000 feet including pavement within the superelevation transitions, the PI_0 must be at most 5 inches per 0.1-mile section.

Add to section 39-1.12:

01-20-12

39-1.12E Reserved

Add to section 39-1.14:

01-20-12

Prepare the area to receive HMA for miscellaneous areas and dikes, including any excavation and backfill as needed.

Replace "6.8" in item 3 in the list in the 4th paragraph of section 39-1.14 with:

04-20-12

6.4

Replace "6.0" in item 3 in the list in the 4th paragraph of section 39-1.14 with:

04-20-12

5.7

Replace "6.8" in the 1st paragraph of section 39-1.15B with:

04-20-12

6.4

Replace "6.0" in the 1st paragraph of section 39-1.15B with:

04-20-12

5.7

Replace the 1st paragraph of section 39-2.02B with:

02-22-13

Perform sampling and testing at the specified frequency for the quality characteristics shown in the following table:

Minimum Quality Control—Standard Construction Process

| Quality characteristic | Test method | Minimum sampling and testing frequency | HMA type | | | |
|--|----------------------------|---|------------------------------|------------------------------|------------------------------|------------------------------|
| | | | A | B | RHMA-G | OGFC |
| Aggregate gradation ^a | California Test 202 | 1 per 750 tons and any remaining part at the end of the project | JMF ± Tolerance ^b |
| Sand equivalent (min) ^c | California Test 217 | | 47 | 42 | 47 | -- |
| Asphalt binder content (%) | California Test 379 or 382 | | JMF±0.40 | JMF±0.40 | JMF ± 0.40 | JMF ± 0.40 |
| HMA moisture content (% max) | California Test 226 or 370 | 1 per 2,500 tons but not less than 1 per paving day | 1.0 | 1.0 | 1.0 | 1.0 |
| Field compaction (% max. theoretical density) ^{d,e} | QC plan | 2 per business day (min.) | 91–97 | 91–97 | 91–97 | -- |
| Stabilometer value (min) ^c No. 4 and 3/8" gradings 1/2" and 3/4" gradings | California Test 366 | 1 per 4,000 tons or 2 per 5 business days, whichever is greater | 30 | 30 | -- | -- |
| | | | 37 | 35 | 23 | -- |
| Air void content (%) ^{c,f} | California Test 367 | | 4 ± 2 | 4 ± 2 | TV ± 2 | -- |
| Aggregate moisture content at continuous mixing plants and RAP moisture content at continuous mixing plants and batch mixing plants ^g | California Test 226 or 370 | 2 per day during production | -- | -- | -- | -- |
| Percent of crushed particles coarse aggregate (% min) One fractured face Two fractured faces Fine aggregate (% min) (Passing no. 4 sieve and retained on no. 8 sieve.) One fractured face | California Test 205 | As designated in the QC plan. At least once per project | 90 | 25 | -- | 90 |
| | | | 75 | -- | 90 | 75 |
| Los Angeles Rattler (% max) Loss at 100 rev. | California Test 211 | | 12 | -- | 12 | 12 |

| | | | | | | |
|---|-------------------------|---|--|--|------------------------------------|-------------|
| Loss at 500 rev. | | | 45 | 50 | 40 | 40 |
| Flat and elongated particles (% max by weight @ 5:1) | California Test 235 | | Report only | Report only | Report only | Report only |
| Fine aggregate angularity (% min) ^h | California Test 234 | | 45 | 45 | 45 | -- |
| Voids filled with asphalt (%) ⁱ No. 4 grading 3/8" grading 1/2" grading 3/4" grading | California Test 367 | | 65.0–75.0 65.0–75.0 65.0–75.0 65.0–75.0 | 65.0–75.0 65.0–75.0 65.0–75.0 65.0–75.0 | Report only | -- |
| Voids in mineral aggregate (% min) ⁱ No. 4 grading 3/8" grading 1/2" grading 3/4" grading | California Test 367 | | 17.0 15.0 14.0 13.0 | 17.0 15.0 14.0 13.0 | -- -- 18.0–23.0 18.0–23.0 | -- |
| Dust proportion ^l No. 4 and 3/8" gradings 1/2" and 3/4" gradings | California Test 367 | | 0.6-1.2 0.6–1.2 | 0.6-1.2 0.6–1.2 | Report only | -- |
| Hamburg wheel track (minimum number of passes at 0.5 inch average rut depth) ^j PG-58 PG-64 PG-70 PG-76 or higher | AASHTO T 324 (Modified) | 1 per 10,000 tons or 1 per project whichever is more | 10,000 15,000 20,000 25,000 | 10,000 15,000 20,000 25,000 | -- | -- |
| Hamburg wheel track (inflection point minimum number of passes) ^j PG-58 PG-64 PG-70 PG-76 or higher | AASHTO T 324 (Modified) | 1 per 10,000 tons or 1 per project whichever is more | 10,000 10,000 12,500 15000 | 10,000 10,000 12,500 15000 | -- | -- |
| Moisture susceptibility (minimum dry strength, psi) ^j | California Test 371 | For RAP ≥15% 1 per 10,000 tons or 1 per project whichever is greater | 120 | 120 | -- | -- |
| Moisture susceptibility (tensile strength ratio, %) ^j | California Test 371 | For RAP ≥15% 1 per 10,000 tons or 1 | 70 | 70 | -- | -- |

| | | per project whichever is greater | | | | |
|--|---------------------|--|---|---|---|---|
| Smoothness | Section 39-1.12 | -- | 12-foot straight- edge, must grind, and PI ₀ |
| Asphalt rubber binder viscosity @ 375 °F, centipoises | Section 39-1.02D | Section 39-1.04C | -- | -- | 1,500– 4,000 | 1,500– 4,000 |
| Asphalt modifier | Section 39-1.02D | Section 39-1.04C | -- | -- | Section 39-1.02D | Section 39-1.02D |
| CRM | Section 39-1.02D | Section 39-1.04C | -- | -- | Section 39-1.02D | Section 39-1.02D |

^a Determine combined aggregate gradation containing RAP under California Test 367.

^b The tolerances must comply with the allowable tolerances in section 39-1.02E.

^c Report the average of 3 tests from a single split sample.

^d Determine field compaction for any of the following conditions:

1. 1/2-inch, 3/8-inch, or no. 4 aggregate grading is used and the specified total paved thickness is at least 0.15 foot.
2. 3/4-inch aggregate grading is used and the specified total paved thickness is at least 0.20 foot.

^e To determine field compaction use:

1. In-place density measurements using the method specified in your QC plan.
2. California Test 309 to determine the maximum theoretical density at the frequency specified in California Test 375, Part 5C.

^f Determine the bulk specific gravity of each lab-compacted briquette under California Test 308, Method A, and theoretical maximum specific gravity under California Test 309.

^g For adjusting the plant controller at the HMA plant.

^h The Engineer waives this specification if HMA contains 10 percent or less of nonmanufactured sand by weight of total aggregate. Manufactured sand is fine aggregate produced by crushing rock or gravel.

ⁱ Report only.

^j Applies to RAP substitution rate greater than 15 percent.

Replace the 1st paragraph of section 39-2.03A with:

02-22-13

The Department samples for acceptance testing and tests for the quality characteristics shown in the following table:

HMA Acceptance—Standard Construction Process

| Quality characteristic | | | | Test method | HMA type | | | |
|---|----------------|------|------|----------------------------|------------------------------|------------------------------|------------------------------|------------------------------|
| | | | | | A | B | RHMA-G | OGFC |
| Aggregate gradation ^a | | | | California Test 202 | JMF ± tolerance ^c |
| Sieve | 3/4" | 1/2" | 3/8" | | | | | |
| 1/2" | X ^b | | | | | | | |
| 3/8" | | X | | | | | | |
| No. 4 | | | X | | | | | |
| No. 8 | X | X | X | | | | | |
| No. 200 | X | X | X | | | | | |
| Sand equivalent (min) ^d | | | | California Test 217 | 47 | 42 | 47 | -- |
| Asphalt binder content (%) | | | | California Test 379 or 382 | JMF±0.40 | JMF±0.40 | JMF ± 0.40 | JMF ± 0.40 |
| HMA moisture content (% max) | | | | California Test 226 or 370 | 1.0 | 1.0 | 1.0 | 1.0 |
| Field compaction (% max. theoretical density) ^{e, f} | | | | California Test 375 | 91–97 | 91–97 | 91–97 | -- |
| Stabilometer value (min) ^d | | | | California Test 366 | 30 | 30 | -- | -- |
| No. 4 and 3/8" gradings | | | | | | | | |
| 1/2" and 3/4" gradings | | | | | 37 | 35 | 23 | -- |
| Air void content (%) ^{d, g} | | | | California Test 367 | 4 ± 2 | 4 ± 2 | TV ± 2 | -- |
| Percent of crushed particles | | | | California Test 205 | 90 | 25 | -- | 90 |
| Coarse aggregate (% min) | | | | | | | | |
| One fractured face | | | | | | | | |
| Two fractured faces | | | | | | | | |
| Fine aggregate (% min) | | | | | | | | |
| (Passing no. 4 sieve and retained on no. 8 sieve.) | | | | | | | | |
| One fractured face | | | | 70 | 20 | 70 | 90 | |
| Los Angeles Rattler (% max) | | | | California Test 211 | 12 | -- | 12 | 12 |
| Loss at 100 rev. | | | | | | | | |
| Loss at 500 rev. | | | | | 45 | 50 | 40 | 40 |
| Fine aggregate angularity (% min) ^h | | | | California Test 234 | 45 | 45 | 45 | -- |
| Flat and elongated particles (% max by weight @ 5:1) | | | | California Test 235 | Report only | Report only | Report only | Report only |
| Voids filled with asphalt (%) ⁱ | | | | California Test 367 | 65.0–75.0 | 65.0–75.0 | Report only | -- |
| No. 4 grading | | | | | | | | |
| 3/8" grading | | | | | | | | |
| 1/2" grading | | | | | | | | |
| 3/4" grading | | | | | 65.0–75.0 | 65.0–75.0 | 65.0–75.0 | 65.0–75.0 |
| Voids in mineral aggregate (% min) ⁱ | | | | California Test 367 | 17.0 | 17.0 | -- | -- |
| No. 4 grading | | | | | | | | |
| 3/8" grading | | | | | | | | |
| 1/2" grading | | | | | | | | |
| 3/4" grading | | | | | 15.0 | 15.0 | 18.0–23.0 | 18.0–23.0 |
| Dust proportion ⁱ | | | | California | | | Report only | -- |

| | | | | | |
|---|-------------------------------|--|---|---|---|
| No. 4 and 3/8" gradings 1/2" and 3/4" gradings | Test 367 | 0.6-1.2 0.6-1.2 | 0.6-1.2 0.6-1.2 | | |
| Hamburg wheel track (minimum number of passes at 0.5 inch average rut depth) ^j PG-58 PG-64 PG-70 PG-76 or higher | AASHTO T 324 (Modified) | 10,000 15,000 20,000 25,000 | 10,000 15,000 20,000 25,000 | -- | -- |
| Hamburg wheel track (inflection point minimum number of passes) ^j PG-58 PG-64 PG-70 PG-76 or higher | AASHTO T 324 (Modified) | 10,000 10,000 12,500 15000 | 10,000 10,000 12,500 15000 | -- | -- |
| Moisture susceptibility (minimum dry strength, psi) ^j | California Test 371 | 120 | 120 | -- | -- |
| Moisture susceptibility (tensile strength ration, %) ^j | California Test 371 | 70 | 70 | -- | -- |
| Smoothness | Section 39-1.12 | 12-foot straight- edge, must grind, and PI ₀ | 12-foot straight- edge, must grind, and PI ₀ | 12-foot straight- edge, must grind, and PI ₀ | 12-foot straight- edge and must grind |
| Asphalt binder | Various | Section 92 | Section 92 | Section 92 | Section 92 |
| Asphalt rubber binder | Various | -- | -- | Section 92- 1.01D(2) and section 39-1.02D | Section 92-1.01D(2) and section 39-1.02D |
| Asphalt modifier | Various | -- | -- | Section 39-1.02D | Section 39-1.02D |
| CRM | Various | -- | -- | Section 39-1.02D | Section 39-1.02D |

^a The Engineer determines combined aggregate gradations containing RAP under California Test 367.

^b "X" denotes the sieves the Engineer tests for the specified aggregate gradation.

^c The tolerances must comply with the allowable tolerances in section 39-1.02E.

^d The Engineer reports the average of 3 tests from a single split sample.

^e The Engineer determines field compaction for any of the following conditions:

1. 1/2-inch, 3/8-inch, or no. 4 aggregate grading is used and the specified total paved thickness is at least 0.15 foot.
2. 3/4-inch aggregate grading is used and the specified total paved thickness is at least 0.20 foot.

^f To determine field compaction, the Engineer uses:

1. California Test 308, Method A, to determine in-place density of each density core.
2. California Test 309 to determine the maximum theoretical density at the frequency specified in California Test 375, Part 5C.

^g The Engineer determines the bulk specific gravity of each lab-compacted briquette under California Test 308, Method A, and theoretical maximum specific gravity under California Test 309.

^h The Engineer waives this specification if HMA contains 10 percent or less of nonmanufactured sand by weight of total aggregate. Manufactured sand is fine aggregate produced by crushing rock or gravel.

ⁱ Report only.

^j Applies to RAP substitution rate greater than 15 percent.

Replace the 5th paragraph of section 39-2.03A with:

01-20-12

The Engineer determines the percent of maximum theoretical density from density cores taken from the final layer measured the full depth of the total paved HMA thickness if any of the following applies:

1. 1/2-inch, 3/8-inch, or no. 4 aggregate grading is used and the specified total paved thickness is at least 0.15 foot and any layer is less than 0.15 foot.
2. 3/4-inch aggregate grading is used and the specified total paved thickness is at least 0.2 foot and any layer is less than 0.20 foot.

Replace the 1st paragraph of section 39-3.02A with:

02-22-13

The Department samples for acceptance testing and tests for the quality characteristics shown in the following table:

HMA Acceptance—Method Construction Process

| Quality characteristic | Test method | HMA type | | | |
|---|----------------------------|------------------------------|------------------------------|------------------------------|------------------------------|
| | | A | B | RHMA-G | OGFC |
| Aggregate gradation ^a | California Test 202 | JMF ± tolerance ^b |
| Sand equivalent (min) ^c | California Test 217 | 47 | 42 | 47 | -- |
| Asphalt binder content (%) | California Test 379 or 382 | JMF±0.40 | JMF±0.40 | JMF ± 0.40 | JMF ± 0.40 |
| HMA moisture content (% max) | California Test 226 or 370 | 1.0 | 1.0 | 1.0 | 1.0 |
| Stabilometer value (min) ^c No. 4 and 3/8" gradings 1/2" and 3/4" gradings | California Test 366 | 30 | 30 | -- | -- |
| | | 37 | 35 | 23 | -- |
| Percent of crushed particles Coarse aggregate (% min) One fractured face Two fractured faces Fine aggregate (% min) (Passing no. 4 sieve and retained on no. 8 sieve.) One fractured face | California Test 205 | 90 | 25 | -- | 90 |
| | | 75 | -- | 90 | 75 |
| | | 70 | 20 | 70 | 90 |
| Los Angeles Rattler (% max) Loss at 100 rev. Loss at 500 rev. | California Test 211 | 12 | -- | 12 | 12 |
| | | 45 | 50 | 40 | 40 |
| Air void content (%) ^{c, d} | California Test 367 | 4 ± 2 | 4 ± 2 | TV ± 2 | -- |
| Fine aggregate angularity (% min) ^e | California Test 234 | 45 | 45 | 45 | -- |
| Flat and elongated particles (% max by weight @ 5:1) | California Test 235 | Report only | Report only | Report only | Report only |
| Voids filled with asphalt (%) ^f No. 4 grading 3/8" grading 1/2" grading 3/4" grading | California Test 367 | 65.0–75.0 | 65.0–75.0 | Report only | -- |
| | | 65.0–75.0 | 65.0–75.0 | | |
| | | 65.0–75.0 | 65.0–75.0 | | |
| | | 65.0–75.0 | 65.0–75.0 | | |
| Voids in mineral aggregate (% min) ^f No. 4 grading 3/8" grading 1/2" grading 3/4" grading | California Test 367 | 17.0 | 17.0 | -- | -- |
| | | 15.0 | 15.0 | -- | -- |
| | | 14.0 | 14.0 | 18.0–23.0 | -- |
| | | 13.0 | 13.0 | 18.0–23.0 | -- |
| Dust proportion ^g No. 4 and 3/8" gradings 1/2" and 3/4" gradings | California Test 367 | 0.6–1.2 | 0.6–1.2 | Report only | -- |
| | | 0.6–1.2 | 0.6–1.2 | | |
| Hamburg wheel track (minimum number of passes at 0.5 inch average rut depth) ^g PG-58 PG-64 | AASHTO T 324 (Modified) | | | -- | -- |
| | | 10,000 | 10,000 | | |
| | | 15,000 | 15,000 | | |

| | | | | | |
|--|-------------------------------|--|--|---|---|
| PG-70 PG-76 or higher | | 20,000 25,000 | 20,000 25,000 | | |
| Hamburg wheel track (inflection point minimum number of passes) ^g | AASHTO T 324 (Modified) | | | -- | -- |
| PG-58 | | 10,000 | 10,000 | | |
| PG-64 | | 10,000 | 10,000 | | |
| PG-70 | | 12,500 | 12,500 | | |
| PG-76 or higher | | 15000 | 15000 | | |
| Moisture susceptibility (minimum dry strength, psi) ^g | California Test 371 | 120 | 120 | -- | -- |
| Moisture susceptibility (tensile strength ration, %) ^g | California Test 371 | 70 | 70 | -- | -- |
| Smoothness | Section 39-1.12 | 12-foot straight- edge and must-grind | 12-foot straight- edge and must-grind | 12-foot straight- edge and must-grind | 12-foot straight- edge and must-grind |
| Asphalt binder | Various | Section 92 | Section 92 | Section 92 | Section 92 |
| Asphalt rubber binder | Various | -- | -- | Section 92- 1.01D(2) and section 39-1.02D | Section 92- 1.01D(2) and section 39-1.02D |
| Asphalt modifier | Various | -- | -- | Section 39-1.02D | Section 39-1.02D |
| CRM | Various | -- | -- | Section 39-1.02D | Section 39-1.02D |

^a The Engineer determines combined aggregate gradations containing RAP under California Test 367.

^b The tolerances must comply with the allowable tolerances in section 39-1.02E.

^c The Engineer reports the average of 3 tests from a single split sample.

^d The Engineer determines the bulk specific gravity of each lab-compacted briquette under California Test 308, Method A, and theoretical maximum specific gravity under California Test 309.

^e The Engineer waives this specification if HMA contains 10 percent or less of nonmanufactured sand by weight of total aggregate. Manufactured sand is fine aggregate produced by crushing rock or gravel.

^f Report only.

^g Applies to RAP substitution rate greater than 15 percent.

Replace "280 degrees F" in item 2 in the list in the 6th paragraph of section 39-3.04 with:

285 degrees F

01-20-12

Replace "5,000" in the 5th paragraph of section 39-4.02C with:

10,000

02-22-13

Replace the 7th paragraph of section 39-4.02C with:

Except for RAP substitution rate of greater than 15 percent, the Department does not use results from California Test 371 to determine specification compliance.

02-22-13

Replace the 8th paragraph of section 39-4.02C with:

02-22-13

Comply with the values for the HMA quality characteristics and minimum random sampling and testing for quality control shown in the following table:

Minimum Quality Control—QC/QA Construction Process

| Quality characteristic | Test method | Minimum sampling and testing frequency | HMA Type | | | Location of sampling | Maximum reporting time allowance |
|--|----------------------------|---|------------------------------|------------------------------|------------------------------|---|----------------------------------|
| | | | A | B | RHMA-G | | |
| Aggregate gradation ^a | California Test 202 | 1 per 750 tons | JMF ± tolerance ^b | JMF ± tolerance ^b | JMF ± tolerance ^b | California Test 125 | 24 hours |
| Asphalt binder content (%) | California Test 379 or 382 | | JMF±0.40 | JMF±0.40 | JMF ±0.40 | Loose mix behind paver See California Test 125 | |
| Field compaction (% max. theoretical density) ^{c,d} | QC plan | | 92–96 | 92–96 | 91–96 | QC plan | |
| Aggregate moisture content at continuous mixing plants and RAP moisture content at continuous mixing plants and batch mixing plants ^e | California Test 226 or 370 | 2 per day during production | -- | -- | -- | Stock-piles or cold feed belts | -- |
| Sand equivalent (min) ^f | California Test 217 | 1 per 750 tons | 47 | 42 | 47 | California Test 125 | 24 hours |
| HMA moisture content (% max) | California Test 226 or 370 | 1 per 2,500 tons but not less than 1 per paving day | 1.0 | 1.0 | 1.0 | Loose Mix Behind Paver See California Test 125 | 24 hours |
| Stabilometer value (min) ^f | California Test 366 | 1 per 4,000 tons or 2 per 5 business days, whichever is greater | 30 | 30 | -- | | 48 hours |
| No. 4 and 3/8" gradings 1/2" and 3/4" gradings | | | 37 | 35 | 23 | | |
| Air void content (%) ^{f,g} | California Test 367 | | 4 ± 2 | 4 ± 2 | TV ± 2 | | |

| | | | | | | | |
|---|---------------------|---|-------------|-------------|-------------|---------------------|----------|
| Percent of crushed particles coarse aggregate (% min.): One fractured face Two fractured faces | California Test 205 | As designated in QC plan. At least once per project. | 90 | 25 | -- | California Test 125 | 48 hours |
| | | | 75 | -- | 90 | | |
| Fine aggregate (% min) (Passing no. 4 sieve and retained on no. 8 sieve): One fractured face | | | 70 | 20 | 70 | | |
| | | | | | | | |
| Los Angeles Rattler (% max): Loss at 100 rev. Loss at 500 rev. | California Test 211 | | 12 | -- | 12 | California Test 125 | |
| | | | 45 | 50 | 40 | | |
| Fine aggregate angularity (% min) ^h | California Test 234 | | 45 | 45 | 45 | California Test 125 | |
| Flat and elongated particle (% max by weight @ 5:1) | California Test 235 | | Report only | Report only | Report only | California Test 125 | |
| Voids filled with asphalt (%) ⁱ No. 4 grading 3/8" grading 1/2" grading 3/4" grading | California Test 367 | | | | Report only | | |
| | | | 65.0–75.0 | 65.0–75.0 | | | |
| | | 65.0–75.0 | 65.0–75.0 | | | | |
| | | 65.0–75.0 | 65.0–75.0 | | | | |
| | | 65.0–75.0 | 65.0–75.0 | | | | |
| Voids in mineral aggregate (% min.) ⁱ No. 4 grading 3/8" grading 1/2" grading 3/4" grading | California Test 367 | | | | | | |
| | | 17.0 | 17.0 | -- | | | |
| | | 15.0 | 15.0 | -- | | | |
| | | 14.0 | 14.0 | 18.0–23.0 | | | |
| | | 13.0 | 13.0 | 18.0–23.0 | | | |

| | | | | | | | |
|---|-------------------------|---|--|--|--|------------------|----------|
| Dust proportion ⁱ | California Test 367 | | | | | | |
| No. 4 and 3/8" gradings | | | 0.6–1.2 | 0.6–1.2 | Report only | | |
| 1/2" and 3/4" gradings | | | 0.6–1.2 | 0.6–1.2 | | | |
| Hamburg wheel track (minimum number of passes at 0.5 inch average rut depth) ⁱ | AASHTO T 324 (Modified) | 1 per 10,000 tons or 1 per project whichever is greater | | | -- | -- | |
| PG-58 | | | 10,000 | 10,000 | | | |
| PG-64 | | | 15,000 | 15,000 | | | |
| PG-70 | | | 20,000 | 20,000 | | | |
| PG-76 or higher | | | 25,000 | 25,000 | | | |
| Hamburg wheel track (inflection point minimum number of passes) ⁱ | AASHTO T 324 (Modified) | 1 per 10,000 tons or 1 per project whichever is greater | | | -- | -- | |
| PG-58 | | | 10,000 | 10,000 | | | |
| PG-64 | | | 10,000 | 10,000 | | | |
| PG-70 | | | 12,500 | 12,500 | | | |
| PG-76 or higher | | | 15000 | 15000 | | | |
| Moisture susceptibility (minimum dry strength, psi) ⁱ | California Test 371 | 1 per 10,000 tons or 1 per project whichever is greater | 120 | 120 | -- | -- | |
| Moisture susceptibility (tensile strength ratio, %) ^j | California Test 371 | 1 per 10,000 tons or 1 per project whichever is greater | 70 | 70 | 70 | -- | |
| Smoothness | Section 39-1.12 | -- | 12-foot straight-edge, must-grind, and Pl ₀ | 12-foot straight-edge, must-grind, and Pl ₀ | 12-foot straight-edge, must-grind, and Pl ₀ | -- | |
| Asphalt rubber binder viscosity @ 375 °F, centipoises | Section 39-1.02D | -- | -- | -- | 1,500–4,000 | Section 39-1.02D | 24 hours |
| CRM | Section 39-1.02D | -- | -- | -- | Section 39-1.02D | Section 39-1.02D | 48 hours |

- ^a Determine combined aggregate gradation containing RAP under California Test 367.
- ^b The tolerances must comply with the allowable tolerances in section 39-1.02E.
- ^c Determines field compaction for any of the following conditions:
 1. 1/2-inch, 3/8-inch, or no. 4 aggregate grading is used and the specified total paved thickness is at least 0.15 foot.
 2. 3/4-inch aggregate grading is used and the specified total paved thickness is at least 0.20 foot.
- ^d To determine field compaction use:
 1. In-place density measurements using the method specified in your QC plan.
 2. California Test 309 to determine the maximum theoretical density at the frequency specified in California Test 375, Part 5C.
- ^e For adjusting the plant controller at the HMA plant.
- ^f Report the average of 3 tests from a single split sample.
- ^g Determine the bulk specific gravity of each lab-compacted briquette under California Test 308, Method A, and theoretical maximum specific gravity under California Test 309.
- ^h The Engineer waives this specification if HMA contains 10 percent or less of nonmanufactured sand by weight of total aggregate. Manufactured sand is fine aggregate produced by crushing rock or gravel.
- ⁱ Report only.
- ^j Applies to RAP substitution rate greater than 15 percent.

Replace the 1st sentence in the 1st paragraph of section 39-4.03B(2) with:

01-20-12

For aggregate gradation and asphalt binder content, the minimum ratio of verification testing frequency to quality control testing frequency is 1:5.

Replace the 2nd "and" in the 7th paragraph of section 39-4.03B(2) with:

01-20-12

or

Replace the 1st paragraph of section 39-4.04A with:

02-22-13

The Engineer samples for acceptance testing and tests for the following quality characteristics:

HMA Acceptance—QC/QA Construction Process

| Index (i) | Quality characteristic | | | | Weight -ing factor (w) | Test method | HMA type | | |
|-----------|--|----------------------------------|------|------|------------------------|----------------------------|------------------------------|------------------------------|------------------------------------|
| | | | | | | | A | B | RHMA-G |
| | | Aggregate gradation ^a | | | | California Test 202 | JMF ± Tolerance ^c | | |
| | Sieve | 3/4" | 1/2" | 3/8" | | | | | |
| 1 | 1/2" | X ^b | -- | -- | 0.05 | | | | |
| 1 | 3/8" | -- | X | -- | 0.05 | | | | |
| 1 | No. 4 | -- | -- | X | 0.05 | | | | |
| 2 | No. 8 | X | X | X | 0.10 | | | | |
| 3 | No. 200 | X | X | X | 0.15 | | | | |
| 4 | Asphalt binder content (%) | | | | 0.30 | California Test 379 or 382 | JMF±0.40 | JMF±0.40 | JMF ± 0.40 |
| 5 | Field compaction (% max. theoretical density) ^{d, e} | | | | 0.40 | California Test 375 | 92–96 | 92–96 | 91–96 |
| | Sand equivalent (min) ^f | | | | | California Test 217 | 47 | 42 | 47 |
| | Stabilometer value (min) ^f No. 4 and 3/8" gradings 1/2" and 3/4" gradings | | | | | California Test 366 | 30 37 | 30 35 | -- 23 |
| | Air void content (%) ^{f, g} | | | | | California Test 367 | 4 ± 2 | 4 ± 2 | TV ± 2 |
| | Percent of crushed particles coarse aggregate (% min) One fractured face Two fractured faces Fine aggregate (% min) (Passing no. 4 sieve and retained on No. 8 sieve.) One fractured face | | | | | California Test 205 | 90 75 70 | 25 -- 20 | -- 90 70 |
| | HMA moisture content (% max) | | | | | California Test 226 or 370 | 1.0 | 1.0 | 1.0 |
| | Los Angeles Rattler (% max) Loss at 100 rev. Loss at 500 rev. | | | | | California Test 211 | 12 45 | -- 50 | 12 40 |
| | Fine aggregate angularity (% min) ^h | | | | | California Test 234 | 45 | 45 | 45 |
| | Flat and elongated particle (% max by weight @ 5:1) | | | | | California Test 235 | Report only | Report only | Report only |
| | Voids in mineral aggregate (% min) ⁱ No. 4 grading 3/8" grading 1/2" grading 3/4" grading | | | | | California Test 367 | 17.0 15.0 14.0 13.0 | 17.0 15.0 14.0 13.0 | -- -- 18.0–23.0 18.0–23.0 |

| | | | | | | |
|--|--|--|-------------------------------|--|---|---|
| | Voids filled with asphalt (%) ⁱ No. 4 grading 3/8" grading 1/2" grading 3/4" grading | | California Test 367 | 65.0–75.0 65.0–75.0 65.0–75.0 65.0–75.0 | 65.0–75.0 65.0–75.0 65.0–75.0 65.0–75.0 | Report only |
| | Dust proportion ¹ No. 4 and 3/8" gradings 1/2" and 3/4" gradings | | California Test 367 | 0.6–1.2 0.6–1.2 | 0.6–1.2 0.6–1.2 | Report only |
| | Hamburg Wheel Tracker (minimum number of passes at 0.5 inch average rut depth) ^j PG-58 PG-64 PG-70 PG-76 or higher | | AASHTO T 324 (Modified) | 10,000 15,000 20,000 25,000 | 10,000 15,000 20,000 25,000 | -- |
| | Hamburg Wheel Tracker (inflection point minimum number of passes) ^j PG-58 PG-64 PG-70 PG-76 or higher | | AASHTO T 324 (Modified) | 10,000 15,000 20,000 25,000 | 10,000 15,000 20,000 25,000 | -- |
| | Moisture susceptibility (minimum dry strength, psi) ^j | | California Test 371 | 120 | 120 | -- |
| | Moisture susceptibility (tensile strength ratio %) ^j | | California Test 371 | 70 | 70 | 70 |
| | Smoothness | | Section 39-1.12 | 12-foot straight- edge, must grind, and PI ₀ | 12-foot straight- edge, must grind, and PI ₀ | 12-foot straight- edge, must grind, and PI ₀ |
| | Asphalt binder | | Various | Section 92 | Section 92 | Section 92 |
| | Asphalt rubber binder | | Various | -- | -- | Section 92-1.01D(2) and section 39-1.02D |
| | Asphalt modifier | | Various | -- | -- | Section 39-1.02D |
| | CRM | | Various | -- | -- | Section 39-1.02D |

- ^a The Engineer determines combined aggregate gradations containing RAP under California Test 367.
- ^b "X" denotes the sieves the Engineer tests for the specified aggregate gradation.
- ^c The tolerances must comply with the allowable tolerances in section 39-1.02E.
- ^d The Engineer determines field compaction for any of the following conditions:
 1. 1/2-inch, 3/8-inch, or no. 4 aggregate grading is used and the specified total paved thickness is at least 0.15 foot and less than 0.20 foot.
 2. 3/4-inch aggregate grading is used and the specified total paved thickness is at least 0.20 foot.
- ^e To determine field compaction, the Engineer uses:
 1. California Test 308, Method A, to determine in-place density of each density core.
 2. California Test 309 to determine the maximum theoretical density at the frequency specified in California Test 375, Part 5C.
- ^f The Engineer reports the average of 3 tests from a single split sample.
- ^g The Engineer determines the bulk specific gravity of each lab-compacted briquette under California Test 308, Method A, and theoretical maximum specific gravity under California Test 309.
- ^h The Engineer waives this specification if HMA contains 10 percent or less of nonmanufactured sand by weight of total aggregate. Manufactured sand is fine aggregate produced by crushing rock or gravel.
- ⁱ Report only.
- ^j Applies to RAP substitution rate greater than 15 percent.

Replace the 3rd paragraph of section 39-4.04A with:

01-20-12

The Department determines the percent of maximum theoretical density from density cores taken from the final layer measured the full depth of the total paved HMA thickness if any of the following applies:

1. 1/2-inch, 3/8-inch, or no. 4 aggregate grading is used and the specified total paved thickness is at least 0.15 foot and any layer is less than 0.15 foot.
2. 3/4-inch aggregate grading is used and the specified total paved thickness is at least 0.20 and any layer is less than 0.20 foot.

AA

40 CONCRETE PAVEMENT

01-20-12

Replace section 40-1.01C(4) with:

01-20-12

40-1.01C(4) Authorized Laboratory

Submit for authorization the name of the laboratory you propose to use for testing the drilled core specimens for air content.

Replace the paragraph in section 40-1.01C(8) with:

01-20-12

Submit a plan for protecting concrete pavement during the initial 72 hours after paving when the forecasted minimum ambient temperature is below 40 degrees F.

01-20-12

Delete "determined under California Test 559" in section 40-1.01C(9).

Replace the 2nd and 3rd paragraphs in section 40-1.01D(4) with:

01-20-12

The QC plan must include details of corrective action to be taken if any process is out of control. As a minimum, a process is out of control if any of the following occurs:

1. For fine and coarse aggregate gradation, 2 consecutive running averages of 4 tests are outside the specification limits
2. For individual penetration or air content measurements:
 - 2.1. One point falls outside the suspension limit line
 - 2.2. Two points in a row fall outside the action limit line

Stop production and take corrective action for out of control processes or the Engineer rejects subsequent material.

Replace the 1st paragraph in section 40-1.01D(5) with:

01-20-12

Determine the minimum cementitious materials content. Use your value for minimum cementitious material content for *MC* in equation 1 and equation 2 of section 90-1.02B(3).

Replace the 1st sentence of the 3rd paragraph of section 40-1.01D(9) with:

01-20-12

Use a California profilograph to determine the concrete pavement profile.

Replace the title of the table in section 40-1.01D(13)(a) with:

01-20-12

Concrete Pavement Acceptance Testing

Replace the 2nd and 3rd paragraphs in section 40-1.01D(13)(a) with:

01-20-12

Pavement smoothness may be accepted based on the Department's testing. A single test represents no more than 0.1 mile.

Acceptance of modulus of rupture, thickness, dowel bar and tie bar placement, coefficient of friction, smoothness, and air content, does not constitute final concrete pavement acceptance.

Delete item 4 in the list in the 2nd paragraph in section 40-1.01D(13)(c)(2).

01-20-12

Replace items 1 and 2 in the list in the 2nd paragraph in 40-1.01D(13)(d) with:

01-20-12

1. For tangents and horizontal curves having a centerline radius of curvature 2,000 feet or more, the PI_0 must be at most 2-1/2 inches per 0.1-mile section.
2. For horizontal curves having a centerline radius of curvature from 1,000 to 2,000 feet including concrete pavement within the superelevation transitions of those curves, the PI_0 must be at most 5 inches per 0.1-mile section.

Replace the 1st and 2nd variables in the equation in section 40-1.01D(13)(f) with:

01-20-12

n_c = Number of your quality control tests (minimum of 6 required)

n_v = Number of verification tests (minimum of 2 required)

Replace "Your approved third party independent testing laboratory" in the 4th paragraph of section 40-1.01D(13)(f) with:

01-20-12

The authorized laboratory

Replace item 2 in the list in the 2nd paragraph of section 40-1.01D(13)(g):

01-20-12

2. One test for every 4,000 square yards of concrete pavement with tie bars or remaining fraction of that area. Each tie bar test consists of 2 cores with 1 on each tie-bar-end to expose both ends and allow measurement.

Replace section 40-1.01D(13)(h) with:

01-20-12

40-1.01D(13)(h) Bar Reinforcement

Bar reinforcement is accepted based on inspection before concrete placement.

Replace the paragraph in section 40-1.02B(2) with:

01-20-12

PCC for concrete pavement must comply with section 90-1 except as otherwise specified.

Replace the paragraphs in section 40-1.02D with:

01-20-12

Bar reinforcement must be deformed bars.

If the project is not shown to be in high desert or any mountain climate region, bar reinforcement must comply with section 52.

If the project is shown to be in high desert or any mountain climate regions, bar reinforcement must be one of the following:

1. Epoxy-coated bar reinforcement under section 52-2.03B except bars must comply with either ASTM A 706/A 706M; ASTM A 996/A 996M; or ASTM A 615/A 615M, Grade 40 or 60. Bars must be handled under ASTM D 3963/D 3963M and section 52-2.02C.
2. Low carbon, chromium steel bar complying with ASTM A 1035/A 1035M

Replace the paragraphs in section 40-1.02E with:

01-20-12

Tie bars must be deformed bars.

If the project is not shown to be in high desert or any mountain climate region, tie bars must be one of the following:

1. Epoxy-coated bar reinforcement. Bars must comply with either section 52-2.02B or 52-2.03B except bars must comply with either ASTM A 706/A 706M; ASTM A 996/A 996M; or ASTM A 615/A 615M, Grade 40 or 60.
2. Stainless-steel bars. Bars must be descaled, pickled, polished, and solid stainless-steel bars under ASTM A 955/A 955M, Grade 60, UNS Designation S31603 or S31803.
3. Low carbon, chromium-steel bars under ASTM A 1035/A 1035M.

If the project is shown to be in high desert or any mountain climate region, tie bars must be one of the following:

1. Epoxy-coated bar reinforcement. Bars must comply with section 52-2.03B except bars must comply with either ASTM A 706/A 706M; ASTM A 996/A 996M; or ASTM A 615/A 615M, Grade 40 or 60.
2. Stainless-steel bars. Bars must be descaled, pickled, polished, and solid stainless-steel bars under ASTM A 955/A 955M, Grade 60, UNS Designation S31603 or S31803.

Fabricate, sample, and handle epoxy-coated tie bars under ASTM D 3963/D 3963M, section 52-2.02C, or section 52-2.03C.

Do not bend tie bars.

Replace the 1st, 2nd, and 3rd paragraphs in section 40-1.02F with:

01-20-12

Dowel bars must be plain bars. Fabricate, sample, and handle epoxy-coated dowel bars under ASTM D 3963/D 3963M and section 52-2.03C except each sample must be 18 inches long.

If the project is not shown to be in high desert or any mountain climate region, dowel bars must be one of the following:

1. Epoxy-coated bars. Bars must comply with ASTM A 615/A 615M, Grade 40 or 60. Epoxy coating must comply with either section 52-2.02B or 52-2.03B.
2. Stainless-steel bars. Bars must be descaled, pickled, polished, and solid stainless-steel bars under ASTM A 955/A 955M, Grade 60, UNS Designation S31603 or S31803.
3. Low carbon, chromium-steel bars under ASTM A 1035/A 1035M.

If the project is shown to be in high desert or any mountain climate region, dowel bars must be one of the following:

1. Epoxy-coated bars. Bars must comply with ASTM A 615/A 615M, Grade 40 or 60. Epoxy coating must comply with section 52-2.03B.
2. Stainless-steel bars. Bars must be descaled, pickled, polished, and solid stainless-steel bars under ASTM A 955/A 955M, Grade 60, UNS Designation S31603 or S31803.

Replace the paragraphs in section 40-1.02G with:

01-20-12

For dowel and tie bar baskets, wire must comply with ASTM A 82/A 82M and be welded under ASTM A 185/A 185M, Section 7.4. The minimum wire-size no. is W10. Use either U-frame or A-frame shaped assemblies.

If the project is not shown to be in high desert or any mountain climate region. Baskets may be epoxy-coated, and the epoxy coating must comply with either section 52-2.02B or 52-2.03B.

If the project is shown to be in high desert or any mountain climate region, wire for dowel bar and tie bar baskets must be one of the following:

1. Epoxy-coated wire complying with section 52-2.03B
2. Stainless-steel wire. Wire must be descaled, pickled, and polished solid stainless-steel. Wire must comply with (1) the chemical requirements in ASTM A 276/A 276M, UNS Designation S31603 or S31803 and (2) the tension requirements in ASTM A 1022/ A 1022M.

Handle epoxy-coated tie bar and dowel bar baskets under ASTM D 3963/D 3963M and either section 52-2.02B or 52-2.03B.

Fasteners must be driven fasteners under ASTM F 1667. Fasteners on lean concrete base or HMA must have a minimum shank diameter of 3/16 inch and a minimum shank length of 2-1/2 inches. For asphalt

treated permeable base or cement treated permeable base, the shank diameter must be at least 3/16 inch and the shank length must be at least 5 inches.

Fasteners, clips, and washers must have a minimum 0.2-mil thick zinc coating applied by either electroplating or galvanizing.

Replace the 1st paragraph in section 40-1.02H with:

01-20-12

Chemical adhesive for drilling and bonding dowels and tie bars must be on the Authorized Material List. The Authorized Material List indicates the appropriate chemical adhesive system for the concrete temperature and installation conditions.

Replace section 40-1.02I(2) with:

01-20-12

40-1.02I(2) Silicone Joint Sealant

Silicone joint sealant must be on the Authorized Material List.

Replace the last sentence in section 40-1.02I(4) with:

01-20-12

Show evidence that the seals are compressed from 30 to 50 percent for the joint width at time of installation.

Replace the paragraph in section 40-1.02L with:

01-20-12

Water for core drilling may be obtained from a potable water source, or submit proof that it does not contain:

1. More than 1,000 parts per million of chlorides as Cl
2. More than 1,300 parts per million of sulfates as SO_4
3. Impurities that cause pavement discoloration or surface etching

Replace the paragraph in section 40-1.03B with:

01-20-12

Before placing concrete pavement, develop enough water supply for the work under section 17.

Replace the last paragraph in section 40-1.03D(1) with:

01-20-12

Removal of grinding residue must comply with section 42-1.03B.

Replace the 1st and 2nd paragraphs in section 40-1.03E(6)(c) with:

01-20-12

Install preformed compressions seals in isolation joints if specified in the special provisions.

Install longitudinal seals before transverse seals. Longitudinal seals must be continuous except splicing is allowed at intersections with transverse seals. Transverse seals must be continuous for the entire transverse length of concrete pavement except splices are allowed for widenings and staged construction. With a sharp instrument, cut across the longitudinal seal at the intersection with transverse

construction joints. If the longitudinal seal does not relax enough to properly install the transverse seal, trim the longitudinal seal to form a tight seal between the 2 joints.

If splicing is authorized, splicing must comply with the manufacturer's written instructions.

Replace the 12th and 13th paragraphs in section 40-1.03G with:

01-20-12

Construct additional test strips if you:

1. Propose different paving equipment including:
 - 1.1. Paver
 - 1.2. Dowel bar inserter
 - 1.3. Tie bar inserter
 - 1.4. Tining
 - 1.5. Curing equipment
2. Change concrete mix proportions

You may request authorization to eliminate the test strip if you use paving equipment and personnel from a Department project (1) for the same type of pavement and (2) completed within the past 12 months. Submit supporting documents and previous project information with your request.

Replace the 1st paragraph in section 40-1.03I with:

01-20-12

Place tie bars in compliance with the tolerances shown in the following table:

| Tie Bar Tolerance | |
|-------------------------------|---|
| Dimension | Tolerance |
| Horizontal and vertical skew | 10 degrees maximum |
| Longitudinal translation | ± 2 inch maximum |
| Horizontal offset (embedment) | ± 2 inch maximum |
| Vertical depth | 1. Not less than 1/2 inch below the saw cut depth of joints 2. When measured at any point along the bar, not less than 2 inches clear of the pavement's surface and bottom |

Replace item 4 in the list in the 2nd paragraph in section 40-1.03I with:

01-20-12

4. Use tie bar baskets. Anchor baskets at least 200 feet in advance of pavement placement activity. If you request a waiver, describe the construction limitations or restricted access preventing the advanced anchoring. After the baskets are anchored and before paving, demonstrate the tie bars do not move from their specified depth and alignment during paving. Use fasteners to anchor tie bar baskets.

Replace "The maximum distance below the depth shown must be 0.05 foot." in the table in section 40-1.03J with:

01-20-12

The maximum distance below the depth shown must be 5/8 inch.

Replace sections 40-1.03L and 40-1.03M with:

01-20-12

40-1.03L Finishing

40-1.03L(1) General

Reserved

40-1.03L(2) Preliminary Finishing

40-1.03L(2)(a) General

Preliminary finishing must produce a smooth and true-to-grade finish. After preliminary finishing, mark each day's paving with a stamp. The stamp must be authorized before paving starts. The stamp must be approximately 1 by 2 feet in size. The stamp must form a uniform mark from 1/8 to 1/4 inch deep. Locate the mark 20 ± 5 feet from the transverse construction joint formed at each day's start of paving and 1 ± 0.25 foot from the pavement's outside edge. The stamp mark must show the month, day, and year of placement and the station of the transverse construction joint. Orient the stamp mark so it can be read from the pavement's outside edge.

Do not apply more water to the pavement surface than can evaporate before float finishing and texturing are completed.

40-1.03L(2)(b) Stationary Side Form Finishing

If stationary side form construction is used, give the pavement a preliminary finish by the machine float method or the hand method.

If using the machine float method:

1. Use self-propelled machine floats.
2. Determine the number of machine floats required to perform the work at a rate equal to the pavement delivery rate. If the time from paving to machine float finishing exceeds 30 minutes, stop pavement delivery. When machine floats are in proper position, you may resume pavement delivery and paving.
3. Run machine floats on side forms or adjacent pavement lanes. If running on adjacent pavement, protect the adjacent pavement surface under section 40-1.03P. Floats must be hardwood, steel, or steel-shod wood. Floats must be equipped with devices that adjust the underside to a true flat surface.

If using the hand method, finish pavement smooth and true to grade with manually operated floats or powered finishing machines.

40-1.03L(2)(c) Slip-Form Finishing

If slip-form construction is used, the slip-form paver must give the pavement a preliminary finish. You may supplement the slip-form paver with machine floats.

Before the pavement hardens, correct pavement edge slump in excess of 0.02 foot exclusive of edge rounding.

40-1.03L(3) Final Finishing

After completing preliminary finishing, round the edges of the initial paving widths to a 0.04-foot radius. Round transverse and longitudinal construction joints to a 0.02-foot radius.

Before curing, texture the pavement. Perform initial texturing with a burlap drag or broom device that produces striations parallel to the centerline. Perform final texturing with a steel-tined device that produces grooves parallel with the centerline.

Construct longitudinal grooves with a self-propelled machine designed specifically for grooving and texturing pavement. The machine must have tracks to maintain constant speed, provide traction, and maintain accurate tracking along the pavement surface. The machine must have a single row of rectangular spring steel tines. The tines must be from 3/32 to 1/8 inch wide, on 3/4-inch centers, and must have enough length, thickness, and resilience to form grooves approximately 3/16 inch deep. The machine must have horizontal and vertical controls. The machine must apply constant down pressure on the pavement surface during texturing. The machines must not cause ravels.

Construct grooves over the entire pavement width in a single pass except do not construct grooves 3 inches from the pavement edges and longitudinal joints. Final texture must be uniform and smooth. Use a guide to properly align the grooves. Grooves must be parallel and aligned to the pavement edge across the pavement width. Grooves must be from 1/8 to 3/16 inch deep after the pavement has hardened.

For irregular areas and areas inaccessible to the grooving machine, you may hand-construct grooves under section 40-1.03L(2) using the hand method. Hand-constructed grooves must comply with the specifications for machine-constructed grooves.

Initial and final texturing must produce a coefficient of friction of at least 0.30 when tested under California Test 342. Notify the Engineer when the pavement is scheduled to be opened to traffic to allow at least 25 days for the Department to schedule testing for coefficient of friction. Notify the Engineer when the pavement is ready for testing which is the latter of:

1. Seven days after paving
2. When the pavement has attained a modulus of rupture of 550 psi

The Department tests for coefficient of friction within 7 days of receiving notification that the pavement is ready for testing.

Do not open the pavement to traffic unless the coefficient of friction is at least 0.30.

40-1.03M Reserved

Replace the 4th paragraph of 40-1.03P with:

01-20-12

Construct crossings for traffic convenience. If authorized, you may use RSC for crossings. Do not open crossings until the Department determines that the pavement's modulus of rupture is at least 550 psi under California Test 523 or California Test 524.

Replace the 1st paragraph of section 40-6.01A with:

01-20-12

Section 40-6 includes specifications for applying a high molecular weight methacrylate resin system to pavement surface cracks that do not extend the full slab depth.

Replace the 4th paragraph of section 40-6.01C(2) with:

01-20-12

If the project is in an urban area adjacent to a school or residence, the public safety plan must also include an airborne emissions monitoring plan prepared by a CIH certified in comprehensive practice by the American Board of Industrial Hygiene. Submit a copy of the CIH's certification. The CIH must monitor the emissions at a minimum of 4 points including the mixing point, the application point, and the point of nearest public contact. At work completion, submit a report by the industrial hygienist with results of the airborne emissions monitoring plan.

Delete the 1st sentence of the 2nd paragraph in section 40-6.02B.

01-20-12

Replace item 4 in the list in the last paragraph in section 40-6.03A with:

01-20-12

4. Coefficient of friction is at least 0.30 under California Test 342

Replace the 2nd paragraph of section 49-2.01D with:

01-20-12

Furnish piling is measured along the longest side of the pile from the specified tip elevation shown to the plane of pile cutoff.

Replace "sets" in the 1st paragraph of section 49-2.04A(3) with:

04-19-13

copies

Replace the 3rd and 4th paragraphs of section 49-2.04B(2) with:

10-19-12

Piles in a corrosive environment must be steam or water cured under section 90-4.03.

If piles in a corrosive environment are steam cured, either:

1. Keep the piles continuously wet for at least 3 days. The 3 days includes the holding and steam curing periods.
2. Apply curing compound under section 90-1.03B(3) after steam curing.

Add to section 49-3.01A:

01-20-12

Concrete must comply with section 51.

Replace the 1st paragraph of section 49-3.01C with:

01-20-12

Except for CIDH concrete piles constructed under slurry, construct CIP concrete piles such that the excavation methods and the concrete placement procedures provide for placing the concrete against undisturbed material in a dry or dewatered hole.

Replace "Reserved" in section 49-3.02A(2) with:

01-20-12

dry hole:

1. Except for CIDH concrete piles specified as end bearing, a drilled hole that:
 - 1.1. Accumulates no more than 12 inches of water in the bottom of the drilled hole during a period of 1 hour without any pumping from the hole during the hour.
 - 1.2. Has no more than 3 inches of water in the bottom of the drilled hole immediately before placing concrete.
2. For CIDH concrete piles specified as end bearing, a drilled hole free of water without the use of pumps.

Replace "Reserved" in section 49-3.02A(3)(a) with:

01-20-12

If plastic spacers are proposed for use, submit the manufacturer's data and a sample of the plastic spacer. Allow 10 days for review.

Replace item 5 in the list in the 1st paragraph of section 49-3.02A(3)(b) with:

10-19-12

5. Methods and equipment for determining:
 - 5.1. Depth of concrete
 - 5.2. Theoretical volume of concrete to be placed, including the effects on volume if casings are withdrawn
 - 5.3. Actual volume of concrete placed

Add to the list in the 1st paragraph of section 49-3.02A(3)(b):

01-18-13

8. Drilling sequence and concrete placement plan.

Replace item 2 in the list in the 1st paragraph of section 49-3.02A(3)(g) with:

01-20-12

2. Be sealed and signed by an engineer who is registered as a civil engineer in the State. This requirement is waived for either of the following conditions:
 - 2.1. The proposed mitigation will be performed under the current Department-published version of *ADSC Standard Mitigation Plan 'A' - Basic Repair* without exception or modification.
 - 2.2. The Engineer determines that the rejected pile does not require mitigation due to structural, geotechnical, or corrosion concerns, and you elect to repair the pile using the current Department-published version of *ADSC Standard Mitigation Plan 'B' - Grouting Repair* without exception or modification.

Replace item 1 in the list in the 1st paragraph of section 49-3.02A(4)(d)(ii) with:

01-20-12

1. Inspection pipes must be schedule 40 PVC pipe complying with ASTM D 1785 with a nominal pipe size of 2 inches. Watertight PVC couplers complying with ASTM D 2466 are allowed to facilitate pipe lengths in excess of those commercially available. Log the location of the inspection pipe couplers with respect to the plane of pile cutoff.

Add to section 49-3.02A(4)(d)(iv):

01-20-12

If the Engineer determines it is not feasible to use one of ADSC's standard mitigation plans to mitigate the pile, schedule a meeting and meet with the Engineer before submitting a nonstandard mitigation plan.

The meeting attendees must include your representatives and the Engineer's representatives involved in the pile mitigation. The purpose of the meeting is to discuss the type of pile mitigation acceptable to the Department.

Provide the meeting facility. The Engineer conducts the meeting.

Replace the 1st paragraph of section 49-3.02B(5) with:

01-20-12

Grout used to backfill casings must comply with section 50-1.02C, except:

1. Grout must consist of cementitious material and water, and may contain an admixture if authorized. Cementitious material must comply with section 90-1.02B, except SCMs are not required. The minimum cementitious material content of the grout must not be less than 845 lb/cu yd of grout.
2. Aggregate must be used to extend the grout as follows:

2. Each jack used to tension prestressing steel permanently anchored at 25 percent or more of its specified minimum ultimate tensile strength must be calibrated by METS within 1 year of use and after each repair. You must:
 - 2.1. Schedule the calibration of the jacking equipment with METS
 - 2.2. Verify that the jack and supporting systems are complete, with proper components, and are in good operating condition
 - 2.3. Mechanically calibrate the gages with a dead weight tester or other authorized means before calibration of the jacking equipment by METS
 - 2.4. Provide enough labor, equipment, and material to (1) install and support the jacking and calibration equipment and (2) remove the equipment after the calibration is complete
 - 2.5. Plot the calibration results
3. Each jack used to tension prestressing steel permanently anchored at less than 25 percent of its specified minimum ultimate tensile strength must be calibrated by an authorized laboratory within 6 months of use and after each repair.

Replace "diameter" in item 9 in the list in the 1st paragraph of section 50-1.02D with:

04-20-12

cross-sectional area

Add to section 50-1.02:

09-16-11

50-1.02G Sheathing

Sheathing for debonding prestressing strand must:

1. Be split or un-split flexible polymer plastic tubing
2. Have a minimum wall thickness of 0.025 inch
3. Have an inside diameter exceeding the maximum outside diameter of the strand by 0.025 to 0.14 inch

Split sheathing must overlap at least 3/8 inch.

Waterproofing tape used to seal the ends of the sheathing must be flexible adhesive tape.

The sheathing and waterproof tape must not react with the concrete, coating, or steel.

Add to section 50-1.03B(1):

01-20-12

After seating, the maximum tensile stress in the prestressing steel must not exceed 75 percent of the minimum ultimate tensile strength shown.

Add to section 50-1.03B(2):

09-16-11

50-1.03B(2)(e) Debonding Prestressing Strands

Where shown, debond prestressing strands by encasing the strands in plastic sheathing along the entire length shown and sealing the ends of the sheathing with waterproof tape.

Distribute the debonded strands symmetrically about the vertical centerline of the girder. The debonded lengths of pairs of strands must be equal.

Do not terminate debonding at any one cross section of the member for more than 40 percent of the debonded strands or 4 strands, whichever is greater.

Thoroughly seal the ends with waterproof tape to prevent the intrusion of water or cement paste before placing the concrete.

AA

51 CONCRETE STRUCTURES

04-19-13

Replace the paragraphs of section 51-1.01A with:

10-19-12

Section 51-1 includes general specifications for constructing concrete structures.

Earthwork for the following concrete structures must comply with section 19-3:

1. Sound wall footings
2. Sound wall pile caps
3. Culverts
4. Barrier slabs
5. Junction structures
6. Minor structures
7. Pipe culvert headwalls, endwalls, and wingwalls for a pipe with a diameter of 5 feet or greater

Falsework must comply with section 48-2.

Joints must comply with section 51-2.

Elastomeric bearing pads must comply with section 51-3.

Reinforcement for the following concrete structures must comply with section 52:

1. Sound wall footings
2. Sound wall pile caps
3. Barrier slabs
4. Junction structures
5. Minor structures
6. PC concrete members

You may use RSC for a concrete structure only where the specifications allow the use of RSC.

Replace the heading of section 51-1.01D(4) with:

04-19-13

Testing Concrete Surfaces

Add to section 51-1.01D(4)(a):

04-19-13

The Engineer tests POC deck surfaces for smoothness and crack intensity.

Add to the list in the 1st paragraph of section 51-1.01D(4)(b):

04-19-13

3. Completed deck surfaces, including ramps and landings of POCs

Replace the 4th paragraph in section 51-1.01D(4)(b) with:

04-19-13

Except for POCs, surface smoothness is tested using a bridge profilograph under California Test 547. Two profiles are obtained in each lane approximately 3 feet from the lane lines and 1 profile is obtained in

each shoulder approximately 3 feet from the curb or rail face. Profiles are taken parallel to the direction of traffic.

Add between the 5th and 6th paragraphs of section 51-1.01D(4)(b):

04-19-13

POC deck surfaces must comply with the following smoothness requirements:

1. Surfaces between grade changes must not vary more than 0.02 foot from the lower edge of a 12-foot-long straightedge placed parallel to the centerline of the POC
2. Surface must not vary more than 0.01 foot from the lower edge of a 6-foot-long straightedge placed perpendicular to the centerline of the POC

Add to section 51-1.01D(4)(d):

04-19-13

The Engineer measures crack intensity of POC deck surfaces after curing, before prestressing, and before falsework release. Clean the surface for the Engineer to measure surface crack intensity.

In any 100 sq ft portion of a new POC deck surface, if there are more than 10 feet of cracks having a width at any point of over 0.02 inch, treat the deck with methacrylate resin under section 15-5.05. Treat the entire deck width between the curbs to 5 feet beyond where the furthest continuous crack emanating from the 100 sq ft section is 0.02 inch wide. Treat the deck surface before grinding.

Add to section 51-1.03C(2)(c)(i):

04-20-12

Permanent steel deck forms are only allowed where shown or if specified as an option in the special provisions.

Replace the 3rd paragraph of section 51-1.03C(2)(c)(ii) with:

04-20-12

Compute the physical design properties under AISI's *North American Specification for the Design of Cold-Formed Steel Structural Members*.

Replace the 8th paragraph of section 51-1.03D(1) with:

10-19-12

Except for concrete placed as pipe culvert headwalls and endwalls, slope paving and aprons, and concrete placed under water, consolidate concrete using high-frequency internal vibrators within 15 minutes of placing concrete in the forms. Do not attach vibrators to or hold them against forms or reinforcing steel. Do not displace reinforcement, ducts, or prestressing steel during vibrating.

Add to section 51-1.03E(5):

08-05-11

Drill the holes without damaging the adjacent concrete. If reinforcement is encountered during drilling before the specified depth is attained, notify the Engineer. Unless coring through the reinforcement is authorized, drill a new hole adjacent to the rejected hole to the depth shown.

Add to section 51-1.03F(5)(a):

04-19-13

For approach slabs, sleeper slabs, and other roadway surfaces of concrete structures, texture the roadway surface as specified for bridge deck surfaces in section 51-1.03F(5)(b).

Replace "Reserved" in section 51-1.03F(5)(b) with:

04-20-12

51-1.03F(5)(b)(i) General

Except for bridge widenings, texture the bridge deck surfaces longitudinally by grinding and grooving or by longitudinal tining.

10-19-12

For bridge widenings, texture the deck surface longitudinally by longitudinal tining.

04-20-12

In freeze-thaw areas, do not texture PCC surfaces of bridge decks.

51-1.03F(5)(b)(ii) Grinding and Grooving

When texturing the deck surface by grinding and grooving, place a 1/4 inch of sacrificial concrete cover on the bridge deck above the finished grade shown. Place items to be embedded in the concrete based on the final profile grade elevations shown. Construct joint seals after completing the grinding and grooving.

Before grinding and grooving, deck surfaces must comply with the smoothness and deck crack treatment requirements.

Grind and groove the deck surface as follows:

1. Grind the surface to within 18 inches of the toe of the barrier under section 42-3. Grinding must not reduce the concrete cover on reinforcing steel to less than 1-3/4 inches.
2. Groove the ground surfaces longitudinally under section 42-2. The grooves must be parallel to the centerline.

51-1.03F(5)(b)(iii) Longitudinal Tining

When texturing the deck surface by longitudinal tining, perform initial texturing with a burlap drag or broom device that produces striations parallel to the centerline. Perform final texturing with spring steel tines that produce grooves parallel with the centerline.

The tines must:

1. Be rectangular in cross section
2. Be from 3/32 to 1/8 inch wide on 3/4-inch centers
3. Have enough length, thickness, and resilience to form grooves approximately 3/16 inch deep

Construct grooves to within 6 inches of the layout line of the concrete barrier toe. Grooves must be from 1/8 to 3/16 inch deep and 3/16 inch wide after concrete has hardened.

For irregular areas and areas inaccessible to the grooving machine, you may hand construct grooves. Hand-constructed grooves must comply with the specifications for machine-constructed grooves.

Tining must not cause tearing of the deck surface or visible separation of coarse aggregate at the surface.

Add to section 51-1.03F:

04-19-13

51-1.03F(6) Finishing Pedestrian Overcrossing Surfaces

Construct deck surfaces, including ramps and landings of POCs to the grade and cross section shown. Surfaces must comply with the specified smoothness, surface texture, and surface crack requirements.

The Engineer sets deck elevation control points for your use in establishing the grade and cross section of the deck surface. The grade established by the deck elevation control points includes all camber allowances. Except for landings, elevation control points include the beginning and end of the ramp and will not be closer together than approximately 8 feet longitudinally and 4 feet transversely to the POC centerline. Landing elevation control points are at the beginning and the end of the landing.

Broom finish the deck surfaces of POCs. Apply the broom finish perpendicular to the path of travel. You may apply water mist to the surface immediately before brooming.

Clean any discolored concrete by abrasive blast cleaning or other authorized methods.

Replace the paragraphs of section 51-1.04 with:

10-19-12

If concrete involved in bridge work is not designated by type and is not otherwise paid for under a separate bid item, the concrete is paid for as structural concrete, bridge.

The payment quantity for structural concrete includes the volume in the concrete occupied by bar reinforcing steel, structural steel, prestressing steel materials, and piling.

The payment quantity for seal course concrete is the actual volume of seal course concrete placed except the payment quantity must not exceed the volume of concrete contained between vertical planes 1 foot outside the neat lines of the seal course shown. The Department does not adjust the unit price for an increase or decrease in the seal course concrete quantity.

Structural concrete for pier columns is measured as follows:

1. Horizontal limits are vertical planes at the neat lines of the pier column shown.
2. Bottom limit is the bottom of the foundation excavation in the completed work.
3. Upper limit is the top of the pier column concrete shown.

The payment quantity for drill and bond dowel is determined from the number and depths of the holes shown.

Replace section 51-2.01B(2) with:

04-19-13

51-2.01B(2) Reserved

04-19-13

Delete the 4th paragraph of section 51-2.01C.

Replace "SSPC-QP 3" in the 1st paragraph of section 51-2.02A(2) with:

10-19-12

AISC-420-10/SSPC-QP 3

Replace the 2nd and 3rd paragraphs of section 51-2.02B(3)(b) with:

04-20-12

Concrete saws for cutting grooves in the concrete must have diamond blades with a minimum thickness of 3/16 inch. Cut both sides of the groove simultaneously for a minimum 1st pass depth of 2 inches. The completed groove must have:

1. Top width within 1/8 inch of the width shown or ordered
2. Bottom width not varying from the top width by more than 1/16 inch for each 2 inches of depth
3. Uniform width and depth

Cutting grooves in existing decks includes cutting any conflicting reinforcing steel.

Replace "sets" in the 1st and 2nd paragraphs of section 51-2.02D(1)(c)(ii) with:

copies

04-19-13

Replace "set" in the 7th paragraph of section 51-2.02D(1)(c)(ii) with:

copy

04-19-13

Add to the 1st paragraph of section 51-2.02D(3):

POC deck surfaces must comply with section 51-1.03F(6) before placing and anchoring joint seal assemblies.

04-19-13

Replace "sets" in the 2nd paragraph of section 51-2.02E(1)(c) with:

copies

04-19-13

Replace "set" in the 6th paragraph of section 51-2.02E(1)(c) with:

copy

04-19-13

Replace the 2nd paragraph of section 51-2.02E(1)(e) with:

Except for components in contact with the tires, the design loading must be the AASHTO LRFD Bridge Design Specifications Design Truck with 100 percent dynamic load allowance. Each component in contact with the tires must support a minimum of 80 percent of the AASHTO LRFD Bridge Design Specifications Design Truck with 100 percent dynamic load allowance. The tire contact area must be 10 inches measured normal to the longitudinal assembly axis by 20 inches wide. The assembly must provide a smooth-riding joint without slapping of components or tire rumble.

08-05-11

Replace "sets" in the 1st and 2nd paragraphs of section 51-2.02F(1)(c) with:

copies

04-19-13

Add between the 1st and 2nd paragraphs of section 51-4.01A:

Prestressing concrete members must comply with section 50.

10-19-12

Delete the 2nd paragraph of section 51-4.01A.

04-20-12

Replace the 3rd paragraph of section 51-4.01C(2) with:

04-20-12

For segmental or spliced-girder construction, shop drawings must include the following additional information:

1. Details showing construction joints or closure joints
2. Arrangement of bar reinforcing steel, prestressing tendons, and pressure-grouting pipe
3. Materials and methods for making closures
4. Construction joint keys and surface treatment
5. Other requested information

For segmental girder construction, shop drawings must include concrete form and casting details.

Replace "sets" in the 1st paragraph of section 51-4.01C(3) with:

04-19-13

copies

Delete the 1st and 2nd paragraphs of section 51-4.02A.

10-19-12

Replace the 3rd paragraph of section 51-4.02B(2) with:

04-20-12

For segmental or spliced-girder construction, materials for construction joints or closure joints at exterior girders must match the color and texture of the adjoining concrete.

Add to section 51-4.02B(2):

04-20-12

At spliced-girder closure joints:

1. If shear keys are not shown, the vertical surfaces of the girder segment ends must be given a coarse texture as specified for the top surface of PC members.
2. Post-tensioning ducts must extend out of the vertical surface of the girder segment closure end sufficiently to facilitate splicing of the duct.

For spliced girders, pretension strand extending from the closure end of the girder segment to be embedded in the closure joint must be free of mortar, oil, dirt, excessive mill scale and scabby rust, and other coatings that would destroy or reduce the bond.

Add to section 51-4.03B:

04-20-12

The specifications for prestressing force distribution and sequencing of stressing in the post-tensioning activity in 50-1.03B(2)(a) do not apply if post-tensioning of spliced girders before starting deck construction is described. The composite deck-girder structure must be post-tensioned in a subsequent stage.

Temporary spliced-girder supports must comply with the specifications for falsework in section 48-2.

Before post-tensioning of spliced girders, remove the forms at CIP concrete closures and intermediate diaphragms to allow inspection for concrete consolidation.

AA

58 SOUND WALLS

04-19-13

Delete the 3rd paragraph of section 58-1.01.

10-19-12

Replace the 1st paragraph of section 58-2.01D(5)(a) with:

08-05-11

You must employ a special inspector and an authorized laboratory to perform Level 1 inspections and structural tests of masonry to verify the masonry construction complies with section 1704, "Special Inspections," and section 2105, "Quality Assurance," of the 2007 CBC.

Delete the 1st paragraph of section 58-2.02F.

10-19-12

Replace "sets" at each occurrence in the 1st paragraph of section 58-4.01C with:

04-19-13

copies

AA

59 PAINTING

04-19-13

Replace "SSPC-SP 10" at each occurrence in section 59 with:

10-19-12

SSPC-SP 10/NACE no. 2

Replace "SSPC-SP 6" at each occurrence in section 59 with:

10-19-12

SSPC-SP 6/NACE no. 3

Replace "SSPC-CS 23.00" at each occurrence in section 59 with:

10-19-12

SSPC-CS 23.00/AWS C 2.23M/NACE no. 12

Replace "SSPC-QP 3 or AISC SPE, Certification P-1 Enclosed" in item 3 in the list in the 1st paragraph of section 59-2.01D(1) with:

10-19-12

AISC-420-10/SSPC-QP 3 (Enclosed Shop)

Replace the paragraphs in section 59-2.03A with:

10-19-12

Clean and paint all exposed structural steel and other metal surfaces.

You must provide enclosures for cleaning and painting structural steel. Cleaning and painting of new structural steel must be performed in an Enclosed Shop as defined in AISC-420-10/SSPC-QP 3. Maintain atmospheric conditions inside enclosures within specified limits.

Except for blast cleaning within closed buildings, perform blast cleaning and painting during daylight hours.

Replace item 1 in the list in the 2nd paragraph of section 59-2.03C(1) with:

10-19-12

1. Apply a stripe coat of undercoat paint on all edges, corners, seams, crevices, interior angles, junctions of joining members, weld lines, and similar surface irregularities. The stripe coat must completely hide the surface being covered. If spot blast cleaning portions of the bridge, apply the stripe coat of undercoat paint before each undercoat and follow with the undercoat as soon as practical. If removing all existing paint from the bridge, apply the undercoat first as soon as practical and follow with the stripe coat of undercoat paint for each undercoat.

Replace the heading of section 59-2.03C(2) with:

04-19-13

Zinc Coating System

Add to section 59-2.03C(2)(a):

04-19-13

Coatings for new structural steel and connections between new and existing structural steel must comply with the requirements shown in the following table:

| Zinc Coating System | | |
|--|--|--------------------------------|
| Description | Coating | Dry film thickness (mils) |
| All new surfaces: | | |
| Undercoat | Inorganic zinc primer, AASHTO M 300 Type I or II | 4–8 |
| Finish coat ^a | Exterior grade latex ^b , 2 coats | 2 minimum each coat, 4–8 total |
| Total thickness, all coats | | 8–14 |
| Connections to existing structural steel:^c | | |
| Undercoat | Inorganic zinc primer, AASHTO M 300 Type I or II | 4–8 |
| Finish coat ^a | Exterior grade latex ^b , 2 coats | 2 minimum each coat, 4–8 total |
| Total thickness, all coats | | 8–14 |

^aIf no finish coats are described, a final coat of inorganic zinc primer is required.

^bExterior grade latex must comply with section 91-2.02 unless otherwise specified.

^cIncludes the following locations:

1. New and existing contact surfaces
2. Existing member surfaces under new HS bolt heads, nuts, or washers
3. Bare surfaces of existing steel after trimming, cutting, drilling, or reaming
4. Areas within a 4-inch radius from the point of application of heat for welding or flame cutting

Add to section 59-2.03C:

04-19-13

59-2.03C(3) Moisture-Cured Polyurethane Coating System

Reserved

59-2.03C(4) State Specification Paint Waterborne Coating System

59-2.03C(4)(a) General

The State Specification PWB coating system for existing structural steel must comply with the requirements shown in the following table:

State Specification PWB Coating System

| Surface | Description | State Specification PWB Coating | Dry film thickness (mils) |
|---|----------------------------|---------------------------------|---------------------------|
| Surfaces cleaned to bare metal ^a : | 1st undercoat | 145 | 2-3 |
| | 2nd undercoat | 146 | 2-3 |
| | 1st finish coat | 171 | 1.5-3 |
| | 2nd finish coat | 172 | 1.5-3 |
| | Total thickness, all coats | -- | 7-12 |
| Existing painted surfaces to be topcoated: | Undercoat | 146 | 2-3 |
| | 1st finish coat | 171 | 1.5-3 |
| | 2nd finish coat | 172 | 1.5-3 |
| | Total thickness, new coats | -- | 5-9 |

^aIncludes locations of spot blast cleaning

59-2.03C(4)(b) Finish Coats

Pressure rinse undercoated surfaces to receive finish coats. Perform pressure rinsing no sooner than 72 hours after the final application of undercoat.

The 1st finish coat must be applied within 48 hours of pressure rinsing.

Apply the 1st finish coat in 2 applications. The 1st application consists of a spray-applied mist application. Apply the 2nd application after the mist application has dried to a set-to-touch condition as determined using the procedure in section 7 of ASTM D 1640.

Apply the 2nd finish coat after the 1st finish coat has dried 12 hours unless authorized. You may apply the 2nd finish coat in a single application.

Add to section 59-5.01:

04-19-13

Where specified, prepare and paint sign structures under sections 59-2 and 59-3.

Instead of submitting proof of the certification complying with SSPC-QP 1, you may submit documentation with the painting quality work plan showing compliance with the requirements in section 3 of SSPC-QP 1.

Instead of submitting proof of the certification complying with SSPC-QP 2, you may submit documentation with the painting quality work plan showing compliance with the requirements in sections 4.2 through 4.4 of SSPC-QP 2, Category A.

Instead of submitting proof of the certification complying with AISC-420-10/SSPC-QP 3 (Enclosed Shop), you may submit documentation with the painting quality work plan showing compliance with the requirements in sections 5 through 18 of AISC-420-10/SSPC-QP3.

86 ELECTRICAL SYSTEMS

10-19-12

Replace section 86-2.06 with:

01-20-12

86-2.06 PULL BOXES

86-2.06A General

86-2.06A(1) Cover Marking

Marking must be clearly defined, uniform in depth, and parallel to either the long or short sides of the cover.

Marking letters must be 1 to 3 inches high.

Before galvanizing steel or cast iron cover, apply marking by one of the following methods:

1. Use cast iron strip at least 1/4 inch thick with letters raised a minimum of 1/16 inch. Fasten strip to cover with 1/4-inch flathead stainless steel machine bolts and nuts. Peen bolts after tightening.
2. Use sheet steel strip at least 0.027 inch thick with letters raised a minimum of 1/16 inch. Fasten strip to cover by spot welding, tack welding, or brazing, with 1/4-inch stainless steel rivets or 1/4-inch roundhead stainless steel machine bolts and nuts. Peen bolts after tightening.
3. Bead weld the letters on cover such that the letters are raised a minimum of 3/32 inch.

86-2.06A(2) Installation and Use

Space pull boxes no more than 200 feet apart. You may install additional pull boxes to facilitate the work.

You may use a larger standard size pull box than that shown on the plans or specified.

A pull box in ground or sidewalk area must be installed as follows:

1. Embed bottom of the pull box in crushed rock.
2. Place a layer of roofing paper on the crushed rock.
3. Place grout over the layer of roofing paper. Grout must be 0.50 to 1 inch thick and sloped toward the drain hole.
4. Make a 1-inch drain hole in the center of the pull box through the grout and roofing paper.
5. Place grout between the pull box and the pull box extension, and around conduits.

The top of the pull box must be flush with the surrounding grade or the top of an adjacent curb, except in unpaved areas where the pull box is not immediately adjacent to and protected by a concrete foundation, pole, or other protective construction. Place the pull box 1-1/4 inches above the surrounding grade. Where practical, place a pull box shown in the vicinity of curbs or adjacent to a standard on the side of the foundation facing away from traffic. If a pull box is installed in a sidewalk area, adjust the depth of the pull box so that the top of the pull box is flush with the sidewalk.

Reconstruct the sump of an existing pull box if disturbed by your activities. Remove old grout and replace with new if the sump was grouted.

86-2.06B Non-Traffic-Rated Pull Boxes

Reserved

86-2.06C Traffic Pull Boxes

Traffic pull box and cover must comply with ASTM C857, "Standard Practice for Minimum Structural Design Loading for Underground Precast Concrete Utility Structures," for HS20-44 loading. You must be able to place the load anywhere on the box and cover for 1 minute without causing cracks or permanent deformations.

Frame must be anchored to the box with 1/4 by 2-1/4 inch concrete anchors. Four concrete anchors must be included for No. 3-1/2(T) pull box; one placed in each corner. Six concrete anchors must be included for No. 5(T) and No. 6(T) pull boxes; one placed in each corner and one near the middle of each of the longer sides.

Nuts must be zinc-plated carbon steel, vibration resistant, and have a wedge ramp at the root of the thread.

After installation of traffic pull box, install the steel cover and keep it bolted down when your activities are not in progress at the pull box. When the steel cover is placed for the final time, the cover and Z bar frame must be cleaned of debris and tightened securely.

Steel cover must be countersunk approximately 1/4 inch to accommodate the bolt head. When tightened, the bolt head must not exceed more than 1/8 inch above the top of the cover.

Concrete placed around and under traffic pull boxes must be minor concrete.

Replace "project" in the 3rd paragraph of section 86-2.11A with:

10-19-12

work

Replace "Contract" in item 2 in the list in the 11th paragraph of section 86-2.11A with:

10-19-12

work

AA

88 GEOSYNTHETICS

01-18-13

Replace the row for hydraulic bursting strength in the table in the 2nd paragraph of section 88-1.02B with:

10-19-12

| | | |
|---------------------------------------|-------------|-----|
| Puncture strength, lb min | ASTM D 6241 | 310 |
| Trapezoid tearing strength, lb min | ASTM D 4533 | 56 |

Replace the 3rd paragraph in section 88-1.02C with:

10-19-12

Geocomposite wall drain must be from 0.25 to 2 inches thick.

Replace the value for permittivity of woven fabric in the table in the 1st paragraph of section 88-1.02E with:

01-20-12

0.05

Replace the value for apparent size opening of nonwoven fabric in the table in the 1st paragraph of section 88-1.02E with:

01-20-12

0.012

Replace the table in the 1st paragraph of section 88-1.02G with:

01-20-12

Sediment Filter Bag

| Property | Test | Values | |
|--|-------------|---------|----------|
| | | Woven | Nonwoven |
| Grab breaking load, lb, 1-inch grip min, in each direction | ASTM D 4632 | 200 | 250 |
| Apparent elongation, percent min, in each direction | ASTM D 4632 | 10 | 50 |
| Water flow rate, gal per minute/sq ft min and max average roll value | ASTM D 4491 | 100-200 | 75-200 |
| Permittivity, sec ⁻¹ min | ASTM D 4491 | 1.0 | 1.0 |
| Apparent opening size, inches max average roll value | ASTM D 4751 | 0.023 | 0.012 |
| Ultraviolet resistance, % min retained grab breaking load, 500 hr. | ASTM D 4355 | 70 | 70 |

Replace the table in the 1st paragraph of section 88-1.02H with:

01-20-12

Temporary Cover

| Property | Test | Values | |
|--|-------------|--------|----------|
| | | Woven | Nonwoven |
| Grab breaking load, lb, 1-inch grip min, in each direction | ASTM D 4632 | 200 | 200 |
| Apparent elongation, percent min, in each direction | ASTM D 4632 | 15 | 50 |
| Water flow rate, gal per minute/sq ft min and max average roll value | ASTM D 4491 | 4-10 | 80-120 |
| Permittivity, sec ⁻¹ min | ASTM D 4491 | 0.05 | 1.0 |
| Apparent opening size, inches max average roll value | ASTM D 4751 | 0.023 | 0.012 |
| Ultraviolet resistance, % min retained grab breaking load, 500 hr. | ASTM D 4355 | 70 | 70 |

Replace section 88-1.02P with:

01-18-13

88-1.02P Biaxial Geogrid

Geosynthetics used for biaxial geogrid must be a punched and drawn polypropylene material formed into an integrally formed biaxial grid. When tested under the referenced test methods, properties of biaxial geogrid must have the values shown in the following table:

