



STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**NOTICE TO BIDDERS  
AND  
SPECIAL PROVISIONS**

**FOR CONSTRUCTION ON STATE HIGHWAY IN EL DORADO COUNTY IN AND  
NEAR MEYERS FROM JOHNSON PASS ROAD TO INCLINE ROAD**

**In District 03 On Route 50**

**Under**

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*Bid book dated May 13, 2013*

*Standard Specifications dated 2010*

*Project plans approved February 25, 2013*

*Standard Plans dated 2010*

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Identified by

Contract No. 03-1A7314

03-ED-50-67.6/72.9

Project ID 0300000213

Federal-Aid Project

ACNH-P050(131)E

**Electronic Advertising Contract**

XS

**Bids open Tuesday, June 25, 2013**

OSD

**Dated May 13, 2013**

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# SPECIAL NOTICES

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

**CONTRACT NO. 03-1A7314**

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

**HIGHWAYS**

  
REGISTERED CIVIL ENGINEER



**LANDSCAPE**

 2/13/13  
LICENSED LANDSCAPE ARCHITECT



 2-13-13  
REGISTERED ELECTRICAL ENGINEER



**TRAFFIC**

 2-19-2013  
REGISTERED CIVIL 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
A20D	Pavement Markers and Traffic Lines, Typical Details
RSP A24A	Pavement Markings - Arrows
A24B	Pavement Markings - Arrows and Symbols
A24D	Pavement Markings - Words
RSP A24E	Pavement Markings - Words, Limit and Yield Lines
RSP A24F	Pavement Markings - Crosswalks
A62A	Excavation and Backfill - Miscellaneous Details
A62F	Excavation and Backfill - Metal and Plastic Culverts
A62G	Excavation and Backfill - Precast Reinforced Concrete Box Culverts
A73A	Object Markers
A73B	Markers
A73C	Delineators, Channelizers and Barricades
A77A1	Metal Beam Guard Railing - Standard Railing Section (Wood Post with Wood Block)
A77B1	Metal Beam Guard Railing - Standard Hardware
A77C1	Metal Beam Guard Railing - Wood Post and Wood Block Details
A77C3	Metal Beam Guard Railing - Typical Line Post Embedment and Hinge Point Offset Details
A77C4	Metal Beam Guard Railing - Typical Railing Delineation and Dike Positioning Details
A77E1	Metal Beam Guard Railing - Typical Layouts for Embankments
A77E2	Metal Beam Guard Railing - Typical Layouts for Embankments
A77E3	Metal Beam Guard Railing - Typical Layouts for Embankments
A77E4	Metal Beam Guard Railing - Typical Layouts for Embankments
A77E5	Metal Beam Guard Railing - Typical Layouts for Embankments

A77E6	Metal Beam Guard Railing - Typical Layouts for Embankments
A77F1	Metal Beam Guard Railing - Typical Layouts for Structure Approach
A77F4	Metal Beam Guard Railing - Typical Layouts for Structure Departure
A77G3	Metal Beam Guard Railing - Typical Layouts for Roadside Fixed Objects
A77H1	Metal Railing - End Anchor Assembly (Type SFT)
A77H3	Metal Railing - Anchor Cable and Anchor Plate Details
A77I2	Metal Beam Guard Railing - Buried Post End Anchor
A77J4	Metal Beam Guard Railing - Transition Railing (Type WB)
A77K1	Metal Beam Guard Railing - Connections to Bridge Railings with Sidewalks Details No. 1
A77K2	Metal Beam Guard Railing - Connections to Bridge Railings with Sidewalks Details No. 2
A87A	Curbs and Driveways
A88A	Curb Ramp Details
D71	Drainage Inlet Markers
RSP D73	Drainage Inlets
D74A	Drainage Inlets
D74C	Drainage Inlet Details
D75A	Steel Pipe Inlets
D75B	Concrete Pipe Inlets
D75C	Pipe Inlets - Ladder and Trash Rack Details
RSP D77A	Grate Details
RSP D77B	Bicycle Traversable Grate Details
D78A	Gutter Depressions
D83A	Precast Reinforced Concrete Box Culvert
D83B	Precast Reinforced Concrete Box Culvert - Miscellaneous Details
D84	Box Culvert Wingwalls - Types A, B and C
D85	Box Culvert Wingwalls - Types D and E
D87D	Overside Drains
D88	Construction Loads on Culverts
D89	Pipe Culvert Headwalls - Straight and "L"
D94A	Metal and Plastic Flared End Sections
D94B	Concrete Flared End Sections
D97I	Corrugated Polyvinyl Chloride Pipe with Smooth Interior - Standard and Positive Joints
D100A	Gabion Basket Details No. 1
D100B	Gabion Basket Details No. 2

H1	Landscape and Erosion Control - Abbreviations
H52	Rolled Erosion Control Product
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)
T51	Temporary Water Pollution Control Details (Temporary Silt Fence)
T53	Temporary Water Pollution Control Details (Temporary Cover)
T56	Temporary Water Pollution Control Details (Temporary Fiber Roll)
T58	Temporary Water Pollution Control Details (Temporary Construction Entrance)
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)
T65	Temporary Water Pollution Control Details [Temporary Fence (Type ESA)]
RSP B11-47	Cable Railing
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
S93	Framing Details for Framed Single Sheet Aluminum Signs, Rectangular Shape
S94	Roadside Framed Single Sheet Aluminum Signs, Rectangular Shape
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-2D	Electrical Systems (Service Equipment Enclosure and Typical Wiring Diagram, Type III - A Series)
ES-3C	Electrical Systems (Controller Cabinet Foundation Details)
ES-3E	Electrical Systems (Telephone Demarcation Cabinet, Type B)
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-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-7J	Electrical Systems (Flashing Beacons)
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-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)
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 Tuesday, June 25, 2013

Dated May 13, 2013

General work description: Construct storm water BMPs, bike lanes and drainage systems.

The Department will receive sealed bids for CONSTRUCTION ON STATE HIGHWAY IN EL DORADO COUNTY IN AND NEAR MEYERS FROM JOHNSON PASS ROAD TO INCLINE ROAD.

District-County-Route-Post Mile: 03-ED-50-67.6/72.9

Contract No. 03-1A7314

The Contractor must have either a Class A license or a combination of Class C licenses which constitutes a majority of the work.

The DBE Contract goal is 7 percent.

Federal-aid project no.:

ACNH-P050(131)E

For the Federal training program, the number of trainees or apprentices is 2.

Bids must be on a unit price basis.

Complete the work within 125 working days.

The estimated cost of the project is \$5,400,000.

No prebid meeting is scheduled for this project.

The Department will receive bids until 2:00 p.m. on the bid open date at 1727 30th Street, Bidders' Exchange, MS 26, Sacramento, CA 95816. Bids received after this time will not be accepted. Department staff will direct the bidders to the bid opening.

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](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](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

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### BID ITEM LIST

Item No.	Item Code	Item Description	Unit of Measure	Estimated Quantity
1	070030	LEAD COMPLIANCE PLAN	LS	LUMP SUM
2	080050	PROGRESS SCHEDULE (CRITICAL PATH METHOD)	LS	LUMP SUM
3	090100	TIME-RELATED OVERHEAD (WDAY)	WDAY	125
4	120090	CONSTRUCTION AREA SIGNS	LS	LUMP SUM
5	120100	TRAFFIC CONTROL SYSTEM	LS	LUMP SUM
6	128652	PORTABLE CHANGEABLE MESSAGE SIGN (LS)	LS	LUMP SUM
7	130100	JOB SITE MANAGEMENT	LS	LUMP SUM
8	130300	PREPARE STORM WATER POLLUTION PREVENTION PLAN	LS	LUMP SUM
9	130310	RAIN EVENT ACTION PLAN	EA	20
10	130320	STORM WATER SAMPLING AND ANALYSIS DAY	EA	22
11	130330	STORM WATER ANNUAL REPORT	EA	3
12	130505	MOVE-IN/MOVE-OUT (TEMPORARY EROSION CONTROL)	EA	5
13	130530	TEMPORARY HYDRAULIC MULCH (BONDED FIBER MATRIX)	SQYD	4,360
14	130560	TEMPORARY SOIL BINDER	SQYD	4,360
15	130570	TEMPORARY COVER	SQYD	4,360
16	130610	TEMPORARY CHECK DAM	LF	520
17	130620	TEMPORARY DRAINAGE INLET PROTECTION	EA	18
18	025485	CLEAR WATER DIVERSION	LS	LUMP SUM
19	130640	TEMPORARY FIBER ROLL	LF	4,800
20	130650	TEMPORARY GRAVEL BAG BERM	LF	1,970

Item No.	Item Code	Item Description	Unit of Measure	Estimated Quantity
21	130670	TEMPORARY REINFORCED SILT FENCE	LF	960
22	130710	TEMPORARY CONSTRUCTION ENTRANCE	EA	4
23	130730	STREET SWEEPING	LS	LUMP SUM
24	130800	TEMPORARY ACTIVE TREATMENT SYSTEM	LS	LUMP SUM
25	130900	TEMPORARY CONCRETE WASHOUT	LS	LUMP SUM
26	141000	TEMPORARY FENCE (TYPE ESA)	LF	11,000
27	146001	CONTRACTOR-SUPPLIED BIOLOGIST (DAY)	WDAY	8
28	146003	NATURAL RESOURCE PROTECTION PLAN	LS	LUMP SUM
29	150230	DESTROY WELL	EA	47
30	150605	REMOVE FENCE	LF	50
31	025486	REMOVE WOOD BOLLARD	EA	270
32	150662	REMOVE METAL BEAM GUARD RAILING	LF	420
33	150668	REMOVE FLARED END SECTION	EA	2
34	150711	REMOVE PAINTED TRAFFIC STRIPE	LF	28,000
35	150712	REMOVE PAINTED PAVEMENT MARKING	SQFT	1,620
36	150742	REMOVE ROADSIDE SIGN	EA	5
37	150801	REMOVE OVERSIDE DRAIN	EA	11
38	025487	REMOVE SAND TRAP	EA	11
39	150820	REMOVE INLET	EA	3
40	150821	REMOVE HEADWALL	EA	16

Item No.	Item Code	Item Description	Unit of Measure	Estimated Quantity
41	151572	RECONSTRUCT METAL BEAM GUARD RAILING	LF	7,840
42	152299	RESET MILEPOST MARKER	EA	1
43	153103	COLD PLANE ASPHALT CONCRETE PAVEMENT	SQYD	1,820
44	155213	CLEANING, INSPECTING, AND PREPARING CULVERT (LF)	LF	1,280
45	155230	CONCRETE INVERT PAVING	LF	58
46	155316	24" CURED-IN-PLACE PIPELINER	LF	1,230
47	025488	21" X 15" CURED-IN-PLACE PIPELINER	LF	55
48	160102	CLEARING AND GRUBBING (LS)	LS	LUMP SUM
49	190101	ROADWAY EXCAVATION	CY	3,200
50	025489	ROADWAY EXCAVATION (VEGETATED SWALES)	CY	360
51	190185	SHOULDER BACKING	TON	350
52	025490	BOULDER (A)	EA	18
53	025491	BOULDER (B)	EA	8
54	025492	BOULDER (C)	EA	20
55	025493	BOULDER (D)	EA	21
56	025494	LOG (12)	EA	14
57	025495	LOG (18)	EA	14
58	210010	MOVE-IN/MOVE-OUT (EROSION CONTROL)	EA	3
59	210130	DUFF	ACRE	1
60	210270	ROLLED EROSION CONTROL PRODUCT (NETTING)	SQFT	82,500

Item No.	Item Code	Item Description	Unit of Measure	Estimated Quantity
61	210290	ROLLED EROSION CONTROL PRODUCT (TRM)	SQFT	58,300
62	210300	HYDROMULCH	SQFT	108,000
63	210420	STRAW	SQFT	190,000
64	025496	HYDROSEED (SEED MIX 1)	SQFT	172,000
65	025497	HYDROSEED (SEED MIX 2)	SQFT	17,300
66	025498	COMPOST (TYPE 1)	SQFT	148,000
67	025499	COMPOST (TYPE 2)	SQFT	58,300
68	210630	INCORPORATE MATERIALS	SQFT	148,000
69	260203	CLASS 2 AGGREGATE BASE (CY)	CY	1,440
70	390250	HOT MIX ASPHALT (TYPE A-WMA)	TON	1,170
71	394060	DATA CORE	LS	LUMP SUM
72	394090	PLACE HOT MIX ASPHALT (MISCELLANEOUS AREA)	SQYD	140
73	397005	TACK COAT	TON	2
74	025500	PRECAST REINFORCED CONCRETE BOX CULVERT	LF	140
75 (F)	510502	MINOR CONCRETE (MINOR STRUCTURE)	CY	58
76	560248	FURNISH SINGLE SHEET ALUMINUM SIGN (0.063"-UNFRAMED)	SQFT	220
77	566011	ROADSIDE SIGN - ONE POST	EA	23
78	568001	INSTALL SIGN (STRAP AND SADDLE BRACKET METHOD)	EA	2
79	025501	CONCRETE COLORATION	SQFT	1,140
80	641101	12" PLASTIC PIPE	LF	60

Item No.	Item Code	Item Description	Unit of Measure	Estimated Quantity
81	641107	18" PLASTIC PIPE	LF	880
82	641113	24" PLASTIC PIPE	LF	820
83 (F)	025502	PERMEABLE MATERIAL	CY	36
84	700617	DRAINAGE INLET MARKER	EA	5
85	700639	36" CORRUGATED STEEL PIPE INLET (.109" THICK)	LF	88
86	705201	12" CONCRETE FLARED END SECTION	EA	2
87	705204	18" CONCRETE FLARED END SECTION	EA	10
88	025503	21" X 15" CONCRETE FLARED END SECTION	EA	2
89	705206	24" CONCRETE FLARED END SECTION	EA	7
90	707117	36" PRECAST CONCRETE PIPE INLET	LF	91
91	719589	MINOR CONCRETE (BACKFILL)	CY	1.9
92	721015	ROCK SLOPE PROTECTION (LIGHT, METHOD B) (CY)	CY	120
93	721026	ROCK SLOPE PROTECTION (NO. 1, METHOD B) (CY)	CY	85
94	721028	ROCK SLOPE PROTECTION (NO. 2, METHOD B) (CY)	CY	19
95	722020	GABION	CY	18
96	025504	FILTER FABRIC	SQYD	810
97	730020	MINOR CONCRETE (CURB) (CY)	CY	370
98	730045	MINOR CONCRETE (GUTTER) (CY)	CY	72
99	730070	DETECTABLE WARNING SURFACE	SQFT	170
100	731504	MINOR CONCRETE (CURB AND GUTTER)	CY	460

Item No.	Item Code	Item Description	Unit of Measure	Estimated Quantity
101	731521	MINOR CONCRETE (SIDEWALK)	CY	48
102	025505	MINOR CONCRETE (COLORED CONCRETE)	CY	14
103 (F)	750001	MISCELLANEOUS IRON AND STEEL	LB	9,615
104	025506	SPLIT RAIL FENCE	LF	40
105	820112	MARKER (CULVERT)	EA	72
106	820151	OBJECT MARKER (TYPE L-1)	EA	13
107	832003	METAL BEAM GUARD RAILING (WOOD POST)	LF	280
108	839521	CABLE RAILING	LF	20
109	025507	WOOD BOLLARDS	EA	330
110	839541	TRANSITION RAILING (TYPE WB)	EA	6
111	839581	END ANCHOR ASSEMBLY (TYPE SFT)	EA	7
112	839584	ALTERNATIVE IN-LINE TERMINAL SYSTEM	EA	4
113	839585	ALTERNATIVE FLARED TERMINAL SYSTEM	EA	15
114	025508	6" THERMOPLASTIC TRAFFIC STRIPE (RECESSED)	LF	10,400
115	025509	6" THERMOPLASTIC TRAFFIC STRIPE (RECESSED, BROKEN 8-4)	LF	1,000
116	025510	8" THERMOPLASTIC TRAFFIC STRIPE (RECESSED)	LF	690
117	025511	THERMOPLASTIC PAVEMENT MARKING (RECESSED)	SQFT	660
118	840581	4" THERMOPLASTIC TRAFFIC STRIPE (RECESSED)	LF	6,620
119	840582	4" TWO-COMPONENT PAINT TRAFFIC STRIPE	LF	15,600
120	025512	4" TWO-COMPONENT PAINT TRAFFIC STRIPE (BROKEN 12-3)	LF	1,110

Item No.	Item Code	Item Description	Unit of Measure	Estimated Quantity
121	840584	8" TWO-COMPONENT PAINT TRAFFIC STRIPE	LF	160
122	840661	TWO-COMPONENT PAINT PAVEMENT MARKING	SQFT	510
123	860090	MAINTAINING EXISTING TRAFFIC MANAGEMENT SYSTEM ELEMENTS DURING CONSTRUCTION	LS	LUMP SUM
124	860150	SIGNAL AND LIGHTING (TEMPORARY)	LS	LUMP SUM
125	860401	LIGHTING	LS	LUMP SUM
126	861501	MODIFY SIGNAL AND LIGHTING	LS	LUMP SUM
127	999990	MOBILIZATION	LS	LUMP SUM

# SPECIAL PROVISIONS

## DIVISION I GENERAL PROVISIONS

### 1 GENERAL

**Add to section 1-1.01:**

**Bid Items and Applicable Sections**

Item code	Item description	Applicable section
025485	CLEAR WATER DIVERSION	13
025486	REMOVE WOOD BOLLARD	15
025487	REMOVE SAND TRAP	15
025488	21" X 15" CURED-IN-PLACE PIPELINER	15
025489	ROADWAY EXCAVATION (VEGETATED SWALES)	19
025490	BOULDER (A)	20
025491	BOULDER (B)	20
025492	BOULDER (C)	20
025493	BOULDER (D)	20
025494	LOG (12)	20
025495	LOG (18)	20
025496	HYDROSEED (SEED MIX 1)	21
025497	HYDROSEED (SEED MIX 2)	21
025498	COMPOST (TYPE 1)	21
025499	COMPOST (TYPE 2)	21
025500	PRECAST REINFORCED CONCRETE BOX CULVERT	51
025501	CONCRETE COLORATION	59
025502	PERMEABLE MATERIAL (F)	68
025503	21" X 15" CONCRETE FLARED END SECTION	70
025504	FILTER FABRIC	72
025505	MINOR CONCRETE (COLORED CONCRETE)	73
025506	SPLIT RAIL FENCE	80
025507	WOOD BOLLARDS	83
025508	6" THERMOPLASTIC TRAFFIC STRIPE (RECESSED)	84
025509	6" THERMOPLASTIC TRAFFIC STRIPE (RECESSED, BROKEN 8-4)	84
025510	8" THERMOPLASTIC TRAFFIC STRIPE (RECESSED)	84
025511	THERMOPLASTIC PAVEMENT MARKING (RECESSED)	84
025512	4" TWO-COMPONENT PAINT TRAFFIC STRIPE (BROKEN 12-3)	84

**Add to section 1-1.09:**

This project is in a freeze-thaw area.

AA

## 2 BIDDING

### Add to section 2-1.06B:

The Department makes the following supplemental project information available:

#### Supplemental Project Information

Means	Description
Included in the <i>Information Handout</i>	(1) U.S. Army Corps of Engineers Nationwide permit (2) California Regional Water Quality Control Board Certification, Lahontan Region (3) California Department of Fish and Game Streambed Alteration Agreement (4) Tahoe Regional Planning Agency Permit
Available as specified in the <i>Standard Specifications</i>	Cross sections

AA

## 5 CONTROL OF WORK

### Add to section 5-1.20A:

During the progress of the work under this Contract, work under the following contracts may be in progress at or near the job site of this Contract:

#### Coincident or Adjacent Contracts

Contract no.	County–Route–Post Mile	City	Type of work
03-1A7324	ED-50-73.7/75.4	South Lake Tahoe	Storm Water Quality Improvements

### Add to section 5-1.36D:

The utility owner will relocate a utility shown in the following table before the corresponding date shown:

#### Utility Relocation and Date of the Relocation

Utility	Location	Date
Southwest Gas UG	241+50 RT	7/1/2013

AA

## 6 CONTROL OF MATERIALS

### Add to section 6-2.03:

The Department furnishes you with:

- Model 2070 controller assembly, including controller unit, completely wired controller cabinet, and detector sensor units
- Components of battery backup system as follows:
  - Inverter/charger unit
  - Power transfer relay
  - Manually-operated bypass switch
  - Battery harness
  - Utility interconnect wires
  - Battery temperature probe
  - Relay contact wires

The Department furnishes you with completely wired controller cabinets with auxiliary equipment but without controller unit at the Department of Transportation District Maintenance Station, 11325 Sanders Drive Rancho Cordova, California 95742 (916) 859-7803. At least 48 hours before you pick up the materials, inform the Engineer of what you will pick up and when you will pick it up.

AA

## 7 LEGAL RELATIONS AND RESPONSIBILITY TO THE PUBLIC

### Replace section 7-1.02K(6)(j)(iii) with:

#### 7-1.02K(6)(j)(iii) Earth Material Containing Lead

Section 7-1.02K(6)(j)(iii) includes specifications for handling, removing, and disposing of earth material containing lead.

Submit a lead compliance plan.

Lead is present in earth material on the job site. The average lead concentrations are below 1,000 mg/kg total lead and below 5 mg/L soluble lead. Earth material on the job site:

1. Is not a hazardous waste
2. Does not require disposal at a permitted landfill or solid waste disposal facility

Lead has been detected in earth material to a depth of 3 feet in unpaved areas of the highway. Levels of lead found on the job site range from less than 1.55 to 307 mg/kg total lead with an average concentration of 2.8 mg/kg total lead as analyzed by EPA test method 6010 or EPA test method 7000 series and based upon a 95 percent upper confidence limit.

Handle earth material containing lead under all applicable laws, rules, and regulations, including those of the following agencies:

1. Cal/OSHA
2. CA RWQCB, Region 6—Lahontan
3. CA Department of Toxic Substances Control



AA

## 9 PAYMENT

### Add to section 9-1.16C:

The following items are eligible for progress payment even if they are not incorporated into the work:

1. Plastic pipe
2. Corrugated steel pipe inlet
3. Concrete flared end sections
4. Precast concrete pipe inlet
5. Split rail fence
6. Miscellaneous iron and steel
7. Metal beam guard railing and appurtenances
8. Signal and lighting standards
9. Luminaires
10. Signal heads and mounting brackets
11. Camera assemblies

AA

## DIVISION II GENERAL CONSTRUCTION

### 10 GENERAL

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

Do not place the uppermost layer of new pavement until all underlying conduits and loop detectors are installed. Do not install loop detectors in or on the base layer.

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.

At the end of each working day if a difference in excess of 0.15 feet exists between the elevation of the existing pavement and the elevation of an excavation within 5 feet left or within 8 feet right of the traveled way, place and compact material against the vertical cut adjacent to the traveled way. During the excavation operation, you may use native material for this purpose except once the placing of the structural section starts, structural material must be used. Place the material up to the top of the existing pavement and taper at a slope of 4:1 (horizontal:vertical) or flatter to the bottom of the excavation. Notify the Engineer, and District 3 Traffic Signal Operations at (530) 634-7619 or (530) 741-4037 5 days before working on any loop detectors or video detection. During periods of traffic control at signalized intersections, the signals may be shut down, or set on flashing mode. Submit a schedule of times you will need the signals to either be shut down or set on flashing mode, and the times you will need the signals to be restored to normal operating mode. The Department will perform all changes in signal operation modes.

AA

## 12 TEMPORARY TRAFFIC CONTROL

Replace section 12-2 with:

### 12-2 CONSTRUCTION PROJECT FUNDING SIGNS

#### 12-2.01 GENERAL

Section 12-2 includes specifications for installing construction project funding signs.

Construction project funding signs must comply with the details shown on the Department's Traffic Operations Web site.

Keep construction project funding signs clean and in good repair at all times.

#### 12-2.02 MATERIALS

Construction project funding signs must be wood post signs complying with section 56-4.

Sign panels for construction project funding signs must be framed, single sheet aluminum panels complying with section 56-2.

The background on construction project funding signs must be Type II retroreflective sheeting on the Authorized Material List for signing and delineation materials.

The legend must be retroreflective, except for nonreflective black letters and numerals. The colors blue and orange must comply with PR Color no. 3 and no. 6, respectively, as specified in the Federal Highway Administration's *Color Tolerance Chart*.

The legend for the type of project on construction project funding signs must read as follows:

HIGHWAY REPAIR

The legend for the types of funding on construction project funding signs must read as follows and in the following order:

FEDERAL HIGHWAY TRUST FUNDS

STATE HIGHWAY FUNDS

The Engineer will provide the year of completion for the legend on construction project funding signs. Furnish and install a sign overlay for the year of completion within 10 working days of notification.

The size of the legend on construction project funding signs must be as described. Do not add any additional information unless authorized.

#### 12-2.03 CONSTRUCTION

Install 2 Type 1 construction project funding signs at the locations designated by the Engineer before starting major work activities visible to highway users.

When authorized, remove and dispose of construction project funding signs upon completion of the project.

#### 12-2.04 PAYMENT

Not Used

Add to section 12-3.12C:

Start displaying the message on the portable changeable message sign 15 minutes before closing the lane.

Place the portable changeable message sign in advance of the 1st warning sign for each:

1. Stationary lane closure
2. Shoulder closure

**Replace section 12-3.13 with:**

### **12-3.13 IMPACT ATTENUATOR VEHICLE**

#### **12-3.13A General**

##### **12-3.13A(1) Summary**

Section 12-3.13 includes specifications for protecting traffic and workers with an impact attenuator vehicle during moving lane closures and when placing and removing components of stationary lane closures, shoulder closures, or a combination.

Do not use an impact attenuator vehicle to place, remove, or place and remove components of a stationary traffic control system on 2-lane, 2-way roadways where the useable shoulder width is less than 10 feet unless authorized by the Engineer.

Impact attenuator vehicles must comply with the following test levels under National Cooperative Highway Research Program 350:

1. Test level 3 if the preconstruction posted speed limit is 50 mph or more
2. Test levels 2 or 3 if the preconstruction posted speed limit is 45 mph or less

Comply with the attenuator manufacturer's instructions for:

1. Support truck
2. Trailer-mounted operation
3. Truck-mounted operation

Flashing arrow signs must comply with section 12-3.03. You may use a portable changeable message sign instead of a flashing arrow sign. If a portable changeable message sign is used as a flashing arrow sign, it must comply with section 6F.56 "Arrow Panels" of the *California MUTCD*.

##### **12-3.13A(2) Definitions**

**impact attenuator vehicle:** A support truck that is towing a deployed attenuator mounted to a trailer or a support truck with a deployed attenuator that is mounted to the support truck.

##### **12-3.13A(3) Submittals**

Upon request, submit a certificate of compliance for each attenuator used on the project.

##### **12-3.13A(4) Quality Control and Assurance**

Do not start impact attenuator vehicle activities until authorized.

Before starting impact attenuator vehicle activities, conduct a preinstallation meeting with the Engineer, subcontractors, and other parties involved with traffic control to discuss the operation of the impact attenuator vehicle during moving lane closures and when placing and removing components of stationary traffic control systems.

Schedule the location, time, and date for the preinstallation meeting with all participants. Furnish the facility for the preinstallation meeting within 5 miles of the job site or at another location if authorized.

##### **12-3.13B Materials**

Attenuators must be a brand on the Authorized Material List for highway safety features.

The combined weight of the support truck and the attenuator must be at least 19,800 pounds, except the weight of the support truck must not be less than 16,100 or greater than 26,400 pounds.

For the Trinity MPS-350 truck-mounted attenuator, the support truck must not have a fuel tank mounted underneath within 10'-6" of the rear of the support truck.

Each impact attenuator vehicle must have:

1. Legal brake lights, taillights, sidelights, and turn signals
2. Inverted "V" chevron pattern placed across the entire rear of the attenuator composed of alternating 4-inch wide nonreflective black stripes and 4-inch wide yellow retroreflective stripes sloping at 45 degrees
3. Type II flashing arrow sign
4. Flashing or rotating amber light
5. Operable 2-way communication system for maintaining contact with workers

### 12-3.13C Construction

Except where prohibited, use an impact attenuator vehicle:

1. To follow behind equipment and workers who are placing and removing components of a stationary lane closure, shoulder closure, or a combination. Operate the flashing arrow sign in the arrow or caution mode during this activity, whichever applies. Follow at a distance that prevents intrusion into the workspace from passing traffic.
2. As a shadow vehicle in a moving lane closure.

After placing components of a stationary traffic control system you may place the impact attenuator vehicle in advance of the work area or at another authorized location to protect traffic and workers.

Secure objects, including equipment, tools, and ballast on impact attenuator vehicles to prevent loosening upon impact by an errant vehicle.

Do not use a damaged attenuator in the work. Replace any attenuator damaged from an impact during work activities at your expense.

### 12-3.13D Payment

Not Used

#### **Add to section 12-4.01:**

Payment for transporting bicyclists through a 1-way reversing traffic control work zone is included in the payment for traffic control system.

#### **Add to section 12-4.02A:**

For installing loop detectors with an impact attenuator vehicle as a shadow vehicle, closure of the adjacent traffic lane is not required.

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.

Under a 1-way reversing traffic control operation, traffic may be stopped in 1 direction for periods not to exceed 10 minutes. After each stoppage, all accumulated traffic for that direction must pass through the work zone before another stoppage is made. Delays to public traffic shall not exceed a total of 20 minutes.

The maximum length of a single stationary lane closure is 1 mile.

Not more than 2 stationary lane closures will be allowed in the direction of travel at one time. Concurrent stationary closures must be spaced no closer than 3 miles apart.

Personal vehicles of your employees must not be parked within the right-of-way. On 2-lane, 2-way highways, 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 a W20-1, "Road Work Ahead," W21-5b, "Right/Left Shoulder Closed Ahead," or C24(CA), "Shoulder Work Ahead," sign mounted on a crashworthy, portable sign support with flags. The sign must be placed as ordered by the Engineer 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.

On 2-lane, 2-way highways, a minimum of 1 paved traffic lane not less than 11 feet wide must be open for use by traffic.

The full width of the traveled way must be open to traffic when construction activities are not actively in progress.

Equipment and materials must not remain in a lane unless the lane is closed to traffic and is used for Contract activities.

If a lane is closed for construction activities and opening the lane becomes necessary for use by traffic, immediately stop active Contract activities and start clearing the lane.

Your vehicles are subject to the provisions under chapter 13, "Vehicular Crossings," of the Vehicle Code.

Do not make lane closures if the atmospheric visibility is less than 1,000 feet.

**Add between the 3rd and 4th paragraphs of the RSS for section 12-4.03:**

For the following operations, submit the contingency plan and discuss with the Engineer at least 5 business days before starting that operation:

1. Roadway Excavation.
2. Cold planing HMA
3. HMA Paving
4. Striping.

Replace "Reserved" in section 12-4.04 with:

Lane Closure Restriction for Designated Holidays and Special Days										
Thu	Fri	Sat	Sun	Mon	Tues	Wed	Thu	Fri	Sat	Sun
x	<b>H</b> xx	xx	xx							
	<b>SD</b> xx									
x	xx	<b>H</b> xx	xx							
		<b>SD</b> xx								
	x	xx	<b>H</b> xx	xx						
			<b>SD</b> xx							
	x	xx	xx	<b>H</b> xx	xxx					
	x	xx	xx	<b>SD</b> xx	xxx					
				x	<b>H</b> xx					
				x	<b>SD</b> xx					
					x	<b>H</b> xx				
						<b>SD</b> xx				
						x	<b>H</b> xx	xx	xx	xx
							<b>SD</b> xx			

Legend:

	Refer to lane requirement charts
x	The full width of the traveled way must be open for use by traffic after 1100 hrs.
xx	The full width of the traveled way must be open for use by traffic.
xxx	The full width of the traveled way must be open for use by traffic until 2000 hrs.
<b>H</b>	Designated holiday
<b>SD</b>	Special day

**Replace "Reserved" in section 12-4.05F with:**

<b>Chart no. 1 Conventional Highway Lane Requirements</b>																									
County: El Dorado					Route/Direction: 50 EB/WB										PM: 67.6/72.9										
Closure limits: PM 67.6/72.9																									
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	R	R	R	R	R	R	R	R	R	R	R	R	R	S	S	S	S	S	S	S	S	R	R	R	R
Fridays	R	R	R	R	R	R	R	R	R	R	R	R	N	N	N	N	N	N	N	N	N	N	N	N	N
Saturdays	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Sundays	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Legend:																									
<b>R</b>	Provide at least 1 through traffic lane, not less than 11 feet in width, for use by both directions of travel (Reversing Control) (Cross street intersections may be controlled using flaggers)																								
<b>S</b>	Shoulder closure allowed																								
<b>N</b>	No work allowed																								
REMARKS:																									
<ul style="list-style-type: none"> <li>This chart is for work from July 8<sup>th</sup> to the day before Labor Day (Peak Season).</li> <li>When construction operations are within 500 feet of SR 50/89 junction, use this chart.</li> </ul>																									

**Chart no. 2  
Conventional Highway Lane Requirements**

County: El Dorado	Route/Direction: 50 EB/WB	PM: 67.6/72.9																								
Closure limits: PM 67.6/72.9																										
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	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
Fridays	R	R	R	R	R	R	R	R	R	R	R	R														
Saturdays																										
Sundays																										

Legend:

- R Provide at least 1 through traffic lane, not less than 11 feet in width, for use by both directions of travel  
(Reversing Control)  
(Cross street intersections may be controlled using flaggers)
- Work allowed within the highway where shoulder or lane closure is not required

REMARKS:

- This chart is for work from the day after Labor Day to June 30<sup>th</sup> (Off-Peak Season).
- When construction operations are within 500 feet of SR 50/89 junction, use this chart.

**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 with stationary and moving lane closures on 2-lane, 2-way highways. The traffic control system for a lane closure must comply with the details shown.

Traffic control system includes signs.

**12-5.02 MATERIALS**

**12-5.03 CONSTRUCTION**

**12-5.03A General**

During traffic striping and pavement marker placement using bituminous adhesive, control traffic with a stationary or a moving lane closure. During other activities, control traffic with stationary lane closures.

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.

**12-5.03B Stationary Lane Closures**

For a stationary lane closure made only for the work period, remove 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.

Each vehicle used to place, maintain, and remove components of a traffic control system, shall have cellular phone and radio contact with personnel in the work area.

Additional advance flaggers are required. All flaggers shall have cellular phone and radio contact with personnel in the work area.

You may use a pilot car to control traffic. If a pilot car is used for traffic control, the cones shown along the centerline need not be placed. The pilot car must have cellular phone and radio contact with personnel in the work area. Operate the pilot car through the traffic control zone at a speed not greater than 25 miles per hour.

**12-5.03C Moving Lane Closures**

A changeable message sign used in a moving lane closure must comply with section 12-3.12 except the sign must be truck-mounted. The full operational height to the bottom of the sign may be less than 7 feet above the ground but must be as high as practicable.

A flashing arrow sign used in a moving lane closure must be truck-mounted. Operate the flashing arrow sign in the caution display mode whenever it is being used on a 2-lane, 2-way highway.

**12-5.04 PAYMENT**

Traffic control system for lane closure is paid for as traffic control system. Flagging costs are paid for as specified in section 12-1.03.

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.

**Replace section 12-8 with:**

## **12-8 TEMPORARY PAVEMENT DELINEATION**

### **12-8.01 GENERAL**

Section 12-8 includes specifications for placing, applying, maintaining, and removing temporary pavement delineation.

Painted traffic stripe used for temporary delineation must comply with section 84-3. Apply 1 or 2 coats.

Temporary signing for no-passing zones must comply with section 12-3.06.

### **12-8.02 MATERIALS**

#### **12-8.02A General**

Not Used

#### **12-8.02B Temporary Lane Line and Centerline Delineation**

Temporary pavement markers must be the same color as the lane line or centerline markers being replaced. Temporary pavement markers must be one of the temporary pavement markers on the Authorized Material List for short-term day or night use, 14 days or less, or long-term day or night use, 180 days or less.

#### **12-8.02C Temporary Edge Line Delineation**

Temporary, removable, construction-grade striping and pavement marking tape must be one of the types on the Authorized Material List. Apply temporary, removable, construction-grade striping and pavement marking tape under the manufacturer's instructions.

### **12-8.03 CONSTRUCTION**

#### **12-8.03A General**

Whenever work activities obliterate pavement delineation, place temporary or permanent pavement delineation before opening the traveled way to traffic. Place lane line and centerline pavement delineation for traveled ways open to traffic. On multilane roadways, freeways, and expressways, place edge line delineation for traveled ways open to traffic.

Establish the alignment for temporary pavement delineation, including required lines or markers. Surfaces to receive an application of paint or removable traffic tape must be dry and free of dirt and loose material. Do not apply temporary pavement delineation over existing pavement delineation or other temporary pavement delineation. Maintain temporary pavement delineation until it is superseded or you replace it with a new striping detail of temporary pavement delineation or permanent pavement delineation.

Place temporary pavement delineation on or adjacent to lanes open to traffic for a maximum of 14 days. Before the end of the 14 days, place the permanent pavement delineation. If the permanent pavement delineation is not placed within the 14 days, replace the temporary pavement markers with additional temporary pavement delineation equivalent to the striping detail specified for the permanent pavement delineation for the area. The Department does not pay for the additional temporary pavement delineation.

When the Engineer determines the temporary pavement delineation is no longer required for the direction of traffic, remove the markers, underlying adhesive, and removable traffic tape from the final layer of surfacing and from the existing pavement to remain in place. Remove temporary pavement delineation that conflicts with any subsequent or new traffic pattern for the area.

#### **12-8.03B Temporary Lane Line and Centerline Delineation**

Whenever lane lines or centerlines are obliterated, the minimum lane line and centerline delineation must consist of temporary pavement markers placed longitudinally at intervals not exceeding 24 feet. The temporary pavement markers must be temporary pavement markers on the Authorized Material List for short-term day or night use, 14 days or less, or long-term day or night use, 180 days or less. Place temporary pavement markers under the manufacturer's instructions. Cement the markers to the surfacing with the adhesive recommended by the manufacturer, except do not use epoxy adhesive to place pavement markers in areas where removal of the markers will be required.

For temporary lane line or centerline delineation consisting entirely of temporary pavement markers, place the markers longitudinally at intervals not exceeding 24 feet.

Where no-passing centerline pavement delineation is obliterated, install the following temporary no-passing zone signs before opening lanes to traffic. Install a W20-1, "Road Work Ahead," sign from 1,000 feet to 2,000 feet in advance of a no-passing zone. Install a R4-1, "Do Not Pass," sign at the beginning of a no-passing zone and at 2,000-foot intervals within the no-passing zone. For continuous zones longer than 2 miles, install a W7-3a or W71 (CA), "Next \_\_\_ Miles," sign beneath the W20-1 sign. Install a R4-2, "Pass With Care," sign at the end of the no-passing zone. The Engineer determines the exact location of temporary no-passing zone signs. Maintain the temporary no-passing zone signs in place until you place the permanent no-passing centerline pavement delineation. Remove the temporary no-passing zone signs when the Engineer determines they are no longer required for the direction of traffic.

### **12-8.03C Temporary Edge Line Delineation**

Whenever edge lines are obliterated on multilane roadways, freeways, and expressways, place edge line delineation for that area adjacent to lanes open to traffic consisting of (1) solid, 4-inch wide traffic stripe tape of the same color as the stripe being replaced, (2) traffic cones, (3) portable delineators or channelizers placed longitudinally at intervals not exceeding 100 feet. You may apply temporary painted traffic stripe where removal of the 4-inch wide traffic stripe will not be required.

The Engineer determines the lateral offset for traffic cones, portable delineators, and channelizers used for temporary edge line delineation. If traffic cones or portable delineators are used for temporary pavement delineation for edge lines, maintain the cones or delineators during hours of the day when the cones or delineators are being used for temporary edge line delineation.

Channelizers used for temporary edge line delineation must be an orange surface-mounted type. Cement channelizer bases to the pavement as specified in section 85 for cementing pavement markers to pavement except do not use epoxy adhesive to place channelizers on the top layer of the pavement. Channelizers must be one of the 36-inch, surface-mounted types on the Authorized Material List.

Remove the temporary edge line delineation when the Engineer determines it is no longer required for the direction of traffic.

### **12-8.04 PAYMENT**

Not Used

AA

## **13 WATER POLLUTION CONTROL**

**Replace the 4<sup>th</sup> paragraph of section 13-1.01A with:**

Do not start job site activities until the SWPPP is authorized.

**Add the definitions for CSMRP and TRPA and replace Normal Working Hours and Qualifying Rain Event in section 13-1.01B with:**

**CSMRP:** Construction Site Monitoring and Reporting Program

**normal working hours:** Hours you normally work on the project, during daylight hours, 7 days a week.

**qualified rain event:** A qualified rain event is a storm that produces any runoff to specified runoff control points that discharge to municipal separate storm sewer systems, surface waters, or tributaries to surface waters that does not exceed the compliance storm event of a 20-year, 1-hour storm, which is equal to an intensity of 1 inch of rainfall in a 1-hour period. Separate storm events must be separated by at least 48 hours of quiescence resulting in less than 0.10 of an inch of rain. Qualified rain events must produce runoff resulting in a discharge off the project boundaries.

**TRPA:** Tahoe Regional Planning Agency

**Delete the sixth paragraph in section 13-1.01B:**

**Replace the 4<sup>th</sup>, 5<sup>th</sup>, and 6<sup>th</sup> paragraph of section 13-3.01A with:**

Discharges of stormwater from the project must comply with NPDES General Permit *for Discharges of Storm Water Runoff Associated with Construction Activity Involving Land Disturbance in the Lake Tahoe Hydrologic Unit – El Dorado, Placer, and Alpine Counties, (Board Order No. R6T-2011-0019, Updated Waste Discharge Requirements and NPDES No. CAG616002)* referred to herein as “Permit”.

Whenever a qualifying rain event produces runoff, sampling and analysis work must comply with the project’s CSMRP.

A storm water annual report must cover the preceding period from October 16<sup>th</sup> to October 15<sup>th</sup>.

**Replace section 13-3.01B(2)(a) with:**

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.

The SWPPP must comply with the Department's *Storm Water Pollution Prevention Plan (SWPPP) and Water Pollution Control Plan (WPCP) Preparation Manual*. Include the following in the SWPPP:

1. Description of the work involved in the installation, maintenance, repair, and removal of temporary and permanent water pollution control practices.
2. Maps showing:
  - 2.1. Locations of disturbed soil areas
  - 2.2. Water bodies and conveyances
  - 2.3. Locations and types of water pollution control practices that will be used for each Contractor-support facility:
  - 2.4. Locations and types of temporary water pollution control practices that will be used in the work for each construction phase
  - 2.5. Locations and types of water pollution control practices that will be installed permanently under the Contract
  - 2.6. Pollutant sampling locations
  - 2.7. Locations planned for storage and use of potential nonvisible pollutants
  - 2.8. Receiving water sampling locations
3. CSMRP
4. Copy of permits obtained by the Department, including Fish & Game permits, US Army Corps of Engineers permits, RWQCB 401 certifications, aerially deposited lead variance from the Department of Toxic Substance Control, aerially deposited lead variance notification, and RWQCB waste discharge requirements for aerially deposited lead reuse.

Include the following items in the SWPPP:

1. Schedule
2. CSMRP
3. REAP
4. Adherence to effluent standards for NALs and NELs

The SWPPP schedule must show when:

1. Work activities will be performed that could cause the discharge of pollutants into stormwater
2. Water pollution control practices associated with each construction phase will be implemented
3. Soil stabilization and sediment control practices for disturbed soil areas will be implemented

Amend and resubmit the SWPPP:

1. Annually before July 15th
2. Whenever:
  - 2.1. Changes in work activities could affect the discharge of pollutants
  - 2.2. Water pollution control practices are added by change order work
  - 2.3. Water pollution control practices are added at your discretion
  - 2.4. Changes in the quantity of disturbed soil are substantial
  - 2.5. Objectives for reducing or eliminating pollutants in stormwater discharges have not been achieved
  - 2.6. You receive a written notice of a permit violation for the project from the RWQCB or any other regulatory agency

Allow the same review time for amendments to the SWPPP as for the original SWPPP.

**Replace section 13-3.01B(2)(b) with:**

**13-3.01B(2)(b) Construction Site Monitoring and Reporting Program (CSMRP)**

The QSD must prepare a CSMRP as part of the SWPPP. The CSMRP must be developed before starting work and be revised to reflect current construction activities as necessary.

Include the following items in the CSMRP:

1. Purpose
2. Visual Monitoring (Inspections)
  - 2.1. Visual monitoring procedures
3. Water Quality Sampling and Analysis
  - 3.1. Visual monitoring procedures
  - 3.2. SAP for nonvisible pollutants
  - 3.3. SAP for nonstormwater discharges
  - 3.4. SAP for monitoring required by RWQCB
  - 3.5. SAP for pH and turbidity
  - 3.6. SAP for temporary active treatment systems
4. Watershed Monitoring Option
5. Quality Assurance and Quality Control
6. Reporting Requirements and Records Retention
7. Non-Compliance Reporting
8. Annual Report
9. Final Report

**Replace the 1<sup>st</sup> paragraph of section 13-3.01B(2)(c) with:**

The SAP must comply with the Department's *Construction Site Monitoring Program (CSMP) Guidance Manual* and Monitoring and Reporting Program of the Permit

For the Monitoring and Reporting Program of the Permit, go to:

[http://www.waterboards.ca.gov/lahtontan/water\\_issues/available\\_documents/misc/tahoe\\_gcp.pdf](http://www.waterboards.ca.gov/lahtontan/water_issues/available_documents/misc/tahoe_gcp.pdf)

**Replace the last paragraph in section 13-3.01B(2)(c) with:**

Include procedure for collecting and analyzing at least 3 samples for each day of each qualifying rain event. Describe the collection of effluent samples at all locations where the storm water is discharged off-site.

**Replace item 2 in the 1<sup>st</sup> paragraph in section 13-3.01B(5) with:**

2. Nonstormwater discharges as follows:
  - 2.1. At the end of each work day during active construction
  - 2.2. Monthly during inactive periods such as winter shutdown

**Delete section 13-3.01B(6)(b)**

**Replace section 13-3.01B(6)(c) with:**

Whenever an NAL, NEL or both are exceeded, notify the Engineer and submit a NEL violation report within 2 hours. 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 taken to manage the exceedance

**Replace section 13-3.01B(7) with:**

Submit a REAP whenever the National Weather Service is predicting a storm event in the form of rainfall with at least a 30 percent probability in the project area within 72 hours.

The WPC Manager must submit a REAP at least 24 hours before a predicted storm event for construction occurring:

1. Between May 1 and October 15
2. During periods when construction activity is conducted under a variance to the land disturbance prohibition of the Permit

The REAP must include:

1. Site location
2. Contact information including 24-hour emergency phone numbers for:
  - 2.1. WPC manager
  - 2.2. Erosion and sediment control providers or subcontractors
  - 2.3. Stormwater sampling providers or subcontractors
3. Storm information
4. Description of:
  - 4.1. Construction phase, including active and inactive areas
  - 4.2. Active work areas and activities
  - 4.3. Subcontractors and trades on the job site
  - 4.4. Prestorm activities including:
    - 4.4.1. Responsibilities of the WPC manager
    - 4.4.2. Responsibilities of the crew and crew size
    - 4.4.3. Stabilization for active and inactive disturbed soil areas
    - 4.4.4. Stockpile management
    - 4.4.5. Corrective actions taken for deficiencies identified during prestorm visual inspections
  - 4.5. Activities to be performed during storm events, including:
    - 4.5.1. Responsibilities of the WPC manager
    - 4.5.2. Responsibilities of the crew and crew size
    - 4.5.3. BMPs for maintenance and repair
5. Flood contingency measures

**Replace the 1<sup>st</sup> paragraph of section 13-3.01B(8) with:**

Submit the storm water annual report before October 31st if construction occurs from October 16th through October 15th or within 15 days after Contract acceptance if construction ends before October 15th. Submit 2 copies of the report. Allow 10 days for the Engineer's review. The Engineer provides comments and specifies the date when the review stopped if revisions are required.

**Replace section 13-3.01C(1) with:**

Assign trained personnel to collect water quality samples. Document the personnel and training in the SAP.

Samples taken by assigned field personnel must comply with the equipment manufacturer's instructions for collection, analytical methods, and equipment calibration.

Samples taken for laboratory analysis must comply with water quality sampling procedures and be analyzed by a State-certified laboratory under 40 CFR part 136, *Guidelines Establishing Test Procedures for the Analysis of Pollutants*.

Whenever downstream samples show increased levels of pollutants, assess water pollution control practices, site conditions, and surrounding influences to determine the probable cause for the increase.

Obtain samples of pH and turbidity as shown in the following table:

Parameter	Test method	Detection limit (min)	Unit
Turbidity	Field test with calibrated portable instrument	1	NTU
pH	Field test with calibrated portable instrument	0.2	pH units

Obtain samples of pH and turbidity from representative and accessible locations upstream of the discharge point and downstream of the discharge point.

For multiple discharge points, obtain samples from a single upstream and a single downstream location.

**Replace section 13-3.01C(2) with:**

NALs must comply with the values shown in the following table:

**Numeric Action Levels**

Parameter	Test method	Detection limit (min)	Unit	Value
pH	Field test with calibrated portable instrument	0.2	pH	Lower NAL = 6.0 Upper NAL = 9.0

The daily average sampling results must not exceed the NAL for pH.

**Replace section 13-3.01C(3) with:**

NELs comply with the values shown in the following table:

**Numeric Effluent Limits**

Parameter	Test method	Detection limit (min)	Unit	Value
Turbidity	Field test with calibrated portable instrument	1	NTU	20 NTU max

The storm event daily average for storms up to the 20-year, 1-hour storm must not exceed the NEL for turbidity.

**Replace section 13-3.03C with:**

Collect samples:

1. During a storm event for:
  - 1.1. Each nonvisible pollutant source and a corresponding uncontaminated control sample
  - 1.2. All locations identified on the *Storm Event Sampling and Analyses Plan* form
2. During a qualifying rain event for:
  - 2.1. Each nonvisible pollutant source and a corresponding uncontaminated control sample
  - 2.2. Turbidity, pH, and other constituents as required
  - 2.3. At least 3 samples for each day of a qualifying rain event
  - 2.4. All locations identified on the *Qualifying Rain Event Sampling and Analyses Plan* form

Perform sample collection during:

1. Normal working hours
2. Each qualifying rain event
3. First 2 hours of each storm event

Collect receiving-water samples whenever a direct discharge to receiving waters occurs and NELs are violated.

Do not physically collect samples during dangerous weather conditions, such as flooding or electrical storms.

Whenever downstream samples show increased levels of turbidity, pH, and other constituents, assess water pollution control practices, site conditions, and surrounding influences to determine the probable cause for the increase.

Document sample collection during precipitation.

Retain documentation of water quality sampling and analysis results with the SWPPP at the job site.

**Add to section 13-6.03H:**

Temporary reinforced silt fence must be Type 2.

**Replace 2nd paragraph of section 13-8.01A with:**

Design, installation, operation, and monitoring of an ATS and monitoring of the treated effluent must comply with Attachment E of *NPDES Permit for Storm Water Discharges Associated with Construction Activity in the Lake Tahoe Hydrologic Unit, Counties of Alpine, El Dorado, and Placer (Order No. R6T-2011-0019, NPDES No. CAG616002)*.

**Replace 1st paragraph of section 13-8.01B(4) with:**

Whenever an NEL is exceeded notify the Engineer and submit an NEL violation report within 2 hours. The report must include:

**Replace 2nd paragraph of section 13-8.02A with:**

Design and implement an ATS to capture and treat a volume equal to the runoff from a 20-year, 1-hour storm which is equal to 1-inch of rainfall in a 1-hour period.

**Replace 2nd paragraph item 9 of section 13-8.01B(2) with:**

9. Operation and maintenance manual for all equipment

**Replace 1st paragraph of section 13-8.01B(4) with:**

Whenever an NEL is exceeded notify the Engineer immediately and submit a NEL violation report within 2 hours. The report must include:

1. Field sampling results and inspections, including:
  - 1.1. Parameters, analytical methods, reporting units, and detection limits (Analytical results that are less than the method detection limits shall be reported as "less than the method detection limits)
  - 1.2. Date, location, time of sampling, visual observations, and measurements
  - 1.3. Quantity of precipitation of the storm event
2. Description of current on site BMPs and proposed corrective actions taken to manage NEL exceedance

**Replace section 13-8.01B(5) with:**

Sampling and Reporting Quality Assurance / Quality Check (QA/QC) Plan

A project-specific QA/QC Plan shall be developed for each project. The QA/QC Plan shall include at a minimum:

1. Calibration – Calibration methods and frequencies for all system and field instruments shall be specified.
2. Method Detection Limits (MDLs) – The methods for determining MDLs shall be specified for each residual coagulant measurement method. Acceptable minimum MDLs for each method, specific to individual coagulants, shall be specified.
3. Laboratory Duplicates – Requirements for monthly laboratory duplicates for residual coagulant analysis shall be specified.

**Personnel Training**

1. Operators shall have training specific to using an ATS and liquid coagulants for storm water discharges in California.
2. The training shall be in the form of a formal class with a certificate and requirements for testing and certificate renewal.
3. Training shall include a minimum of eight hours classroom and 32 hours field training. The course shall cover the following topics:
  - a. Coagulation Basics – Chemistry and physical processes
  - b. ATS System Design and Operating Principles
  - c. ATS Control Systems
  - d. Coagulant Selection – Jar testing, dose determination, etc.
  - e. Aquatic Safety/Toxicity of Coagulants, proper handling and safety
  - f. Monitoring, Sampling, and Analysis
  - g. Reporting and Recordkeeping
  - h. Emergency Response

If the ATS is discharging treated effluent, submit a daily inspection report within 24 hours.

Submit records of delivery and removal of ATS components.

**Add after paragraph 3 section 13-8.03A with:**

Sediment shall be removed from the storage or treatment cells as necessary to ensure that the cells maintain their required water storage (i.e., volume) capability.

Handling and disposal of all solids generated during ATS operations shall be done in accordance with all local, state, and federal laws and regulations.

**Add after the 6th paragraph to section 13-8.03B:**

If operating ATS in Batch Treatment mode, the discharger shall perform toxicity testing in accordance with the following:

1. The discharger shall initiate acute toxicity testing on effluent samples representing effluent from each batch prior to discharge (This requirement only requires that the test be initiated prior to discharge.). All bioassays shall be sent to a laboratory certified by the Department of Public Health Environmental Laboratory Accreditation Program (ELAP). The required field of testing number for Whole Effluent Toxicity (WET) testing is E113 ([http://www.dhs.ca.gov/ps/ls/elap/pdf/FOT\\_Desc.pdf](http://www.dhs.ca.gov/ps/ls/elap/pdf/FOT_Desc.pdf)).
2. Acute toxicity tests shall be conducted with the following species and protocols. The methods to be used in the acute toxicity testing shall be those outlined for a 96 hour acute test in "Methods for Measuring the Acute Toxicity of Effluents and Receiving Water to Freshwater and Marine Organisms, USEPA-841-R-02-012" for Fathead minnow, *Pimephales promelas* (fathead minnow). Acute toxicity for *Oncorhynchus mykiss* (Rainbow Trout) may be used as a substitute for testing fathead minnows.
3. All toxicity tests shall meet quality assurance criteria and test acceptability criteria in the most recent versions of the EPA test method for WET testing.

**Replace section 13-11 with:**

**13-11 TEMPORARY CLEAR WATER DIVERSION SYSTEM**

**13-11.01 GENERAL**

**13-11.01 Summary**

This work includes constructing, monitoring, maintaining, and removing temporary clear water diversion system. Temporary clear water diversion system collects and conveys stream water around the work area.

**13-11.02 SUBMITTAL**

The SWPPP must describe a temporary clear water diversion system plan (Diversion Plan.). The Diversion Plan must include:

1. Title sheet
2. Table of contents
3. Anticipated flow rates
4. Operation and system maintenance procedures
5. Field-recorded data and visual inspection example logs, and
6. Working drawings of the temporary clear water diversion operations showing:
  - 6.1. Section and plan views of the diversion systems
  - 6.2. Location of sampling points for water quality measurements as required by regulatory agencies
  - 6.3. Flow path and placement of pipes, hoses, pumps, and other equipment used to convey water, and
  - 6.4. Location and construction details at point of return of stream flows to the natural channel and energy dissipater components
  - 6.5. Sampling plan per Section 600 of the Preparation Manual
7. Certificates of Compliance as specified in Section 6-3.05E, "Certificates of Compliance" of the Standard Specifications for:
  - 7.1. Gravel-filled bag fabric
  - 7.2. Impermeable plastic sheet
  - 7.3. Pump intake screen
8. Description of the waste discharge from the temporary clear water diversion operations showing:

- 8.1. Location and construction details of discharge area or outfall
- 8.2. Name of receiving water
- 8.3. Discharge method
- 8.4. Field-recorded data and visual inspection of planned effluent
- 8.5. Control measure used and maintained for pollution control
- 8.6. Parameters to be monitored for discharges to surface waters including turbidity, total nitrogen, and total phosphorous

**13-11.03 MATERIALS**

**13-11.03A Gravel-filled Bags**

Gravel-filled bags must:

- 1. Be made from gravel-filled bag fabric
- 2. Have inside dimensions between 24 inches to 32 inches in length, and between 16 inches and 20 inches in width
- 3. Have the opening bound to retain the gravel. The opening must be sewn with yarn, bound with wire, or secured with a closure device.
- 4. Weigh between 30 pounds and 50 pounds when filled with gravel

**Gravel Filled Bag Fabric**

Property	ASTM Designation	Specification
Grab breaking load 1-inch grip, lb, min. in each direction	D 4632	205
Apparent elongation percent, min., in each direction	D 4632	50
Water Flow Rate max. average roll value, gallons per minute/square foot	D 4491	80-150
Permittivity 1/sec., min.	D 4491	1.2
Apparent opening size max. average roll value, U.S. Standard sieve size	D 4751	40-80
Ultraviolet Degradation percent of original unexposed grab breaking load 500 hr, minimum	D 4595	70

Gravel for gravel-filled bags must be:

- 1. Rounded river rock between 3/8 inch and 3/4 inch in diameter
- 2. Washed and free of adhered soil material prior to arrival on the job site with a cleanliness value of 85 or higher (California Test No. 227)

The Contractor may use permeable material from on-site sources such as river run gravel to fill gravel bags if approved by the Engineer. Permeable material must:

- 1. Comply with Section 68-2.02F, "Permeable Material" of the Standard Specifications

### **13-11.03B Gravel for Channel**

Gravel used in channel must be:

1. Washed and free of adhered soil material , uncrushed natural river rock with a cleanliness value of 85 or higher (California Test No. 227)
2. Graded with at least 98% passing a 3-inch screen, 60-80% passing a two (2) inch screen, and 0-5% passing a half (1/2) inch screen (% by dry wt) or approved by California Department of Fish and Game
3. Completely free of oils or any other petroleum based material, clay, debris, and other types of organic matter

You may stockpile gravel, but do not mix with earthen material.

### **13-11.03C Impermeable Plastic Sheet**

Impermeable plastic sheet must be:

1. Single ply
2. New polyethylene sheeting with a minimum of 10 mils thick, free of defects that compromise the impermeability

### **13-11.03D Pipe**

Pipe must:

1. Be clean, uncoated, in good condition free of rust, paint oil dirt or other residues that could potentially contribute to water pollution
2. Be adequately supported for planned loads
3. Use watertight joints
4. Be made of a material or combination of materials that are suitable for clean water and which do not contain banned, hazardous or unlawful substances

### **13-11.03E Pumping System**

Pumping system must:

1. Be equipped with second containment
2. Be free of fuel and oil leaks
3. Meet intake screen regulatory requirements

### **13-11.04 CONSTRUCTION**

Construct the diversion system according to the approved Diversion Plan.

Use of the temporary clear water diversion system is restricted to the period from July 15 to October 15. If the work requires more than one restricted period, remove the temporary clear water diversion system by the conclusion of the restricted period and reposition during the following restricted period at the Contractor's expense.

Install impermeable plastic sheet with minimal seams. Where seams occur, lap and seal with commercial quality waterproof tape. Seal joints between the impermeable plastic sheet and the flexible plastic pipe with commercial quality waterproof tape.

Re-contour streambed and bank to pre-project conditions. Backfill and repair ground disturbance, including holes and depressions, caused by the installation and removal of the temporary clear water diversion system. Use permeable materials comparable to the native material.



**14-6.05A(2)(g) Annual Monitoring Report**

Submit no later than January 15 during each year of construction.

**14-6.05A(2)(h) Final Monitoring Report**

Submit no later than 20 days after completion of the project.

**14-6.05A(3) Quality Control and Assurance**

**14-6.05A(3)(a) Qualifications**

A biologist must meet PLAC requirements. Provide required qualifications for transmittal to regulatory agencies. All project specific authorizations must be current and valid for the duration of the project.

**14-6.05B Materials**

Not Used

**14-6.05C Construction**

**14-6.05C(1) General**

Not Used

**14-6.05C(2) Pre-construction Survey**

Survey the work area for regulated species within 14 days before starting construction activities.

**14-6.05C(3) Protective Radius**

Not Used

**14-6.05C(4) Monitoring Schedule**

Monitoring must comply with the schedule in section 14-6.07.

**14-6.05C(5) Monitoring Duties**

Implement monitoring as specified in section 14-6.07.

**14-6.05C(6) Notification and Reporting**

All reports must include the following:

1. PLAC requirement implementation
2. Name(s) of the biologist(s) conducting biological activity
3. Date(s) and time(s) of monitoring
4. Locations and activities monitored
5. Representative photographs
6. Findings
7. If regulated species are observed, reports must recommend actions to protect the regulated species
8. Name of the biologist who prepared the report
9. Signature of the biologist certifying the accuracy of the report

The Pre-Construction Survey Report includes one of the following:

1. Detailed observations and locations where regulated species were observed
2. Statement that no regulated species were observed by each biologist

The Incident Report includes:

1. Description of any take incident
2. Species name and number taken
3. Details of required notifications with contact information
4. Corrective actions proposed or taken
5. Disposition of taken species

The Annual Monitoring Report includes:

1. Construction beginning and ending dates
2. Identification of project impacts on the species covered in the plan
3. Species protection measures with protection measure implementation details
4. Incidental take details, including species name, number taken, people contacted, contact information, and disposition of taken species
5. An assessment of the effectiveness of the species protection measures to mitigate project impacts
6. Recommendations to improve efficiency of protection measures to mitigate impacts to regulated species

The Final Monitoring Report must be a cumulative report following the format of the Annual Monitoring Report.

#### **14-6.05D Payment**

Not Used

**Replace section 14-6.07 with:**

#### **14-6.07 NATURAL RESOURCE PROTECTION PLAN**

##### **14-6.07A General**

##### **14-6.07A(1) Summary**

Section 14-6.07 includes specifications for preparing a plan to protect biological resources.

Prepare a natural resource protection plan that defines measures you will take to maintain project compliance with all environmental laws, regulations, and PLAC requirements.

Comply with section 14-6.02.

This project is within or near habitat for regulated species. Regulated species include the following:

1. Lahontan cutthroat trout
2. Mountain yellow-legged frog

##### **14-6.07A(2) Submittals**

##### **Not Used 14-6.07A(3) Quality Control and Assurance**

The natural resource protection plan must be prepared and signed by a biologist knowledgeable of the species or habitats discussed and address species protection measures.

The natural resource protection plan includes:

1. List of species and habitats addressed in the plan
2. List of protocols for species protection surveys, with full protocols in an appendix
3. Protection measures for regulated species likely to occur in the project site
4. Protective radii for regulated species encounters
5. Implementation plan for protection measures, including monitoring schedule
6. Monitoring duties
7. Justification for each instance where protection measures and an implementation plan are not necessary for a regulated species
8. Schedule for inspecting protection measures
9. Schedule for maintaining protection measures
10. Schedule for submittal of monitoring reports
11. Response plan for instances where regulated species are encountered
12. Content and schedule for a Biological Resource Information Program
13. Location and schedule of fence installation and removal, with identification of species or habitats to be protected by each ESA and Species Protection Area (SPA)
14. Protection measures required within each SPA

**14-6.07B Materials**

Not Used

**14-6.07C Construction**

Not Used

**14-6.07D Payment**

Not Used

**Replace section 14-11.09 with:**

**14-11.09 TREATED WOOD WASTE**

**14-11.09A General**

**14-11.09A(1) Summary**

Section 14-11.09 includes specifications for handling, storing, transporting, and disposing of treated wood waste (TWW).

Wood removed from metal beam guard railing and roadside sign is TWW. Manage TWW under 22 CA Code of Regs, Div. 4.5, Chp. 34.

**14-11.09A(2) Submittals**

For disposal of TWW, submit as an informational submittal a copy of each completed shipping record and weight receipt within 5 business days.

**14-11.09B Materials**

Not Used

**14-11.09C Construction**

**14-11.09C(1) General**

**14-11.09C(2) Training**

Provide training to personnel who handle TWW or may come in contact with TWW. Training must include:

1. All applicable requirements of 8 CA Code of Regs
2. Procedures for identifying and segregating TWW
3. Safe handling practices
4. Requirements of 22 CA Code of Regs, Div. 4.5, Chp. 34
5. Proper disposal methods

Maintain records of personnel training for 3 years.

**14-11.09C(3) Storage**

Store TWW before disposal using the following methods:

1. Elevate on blocks above a foreseeable run-on elevation and protect from precipitation for no more than 90 days.
2. Place on a containment surface or pad protected from run-on and precipitation for no more than 180 days.
3. Place in water-resistant containers designed for shipping or solid waste collection for no more than 1 year.
4. Place in a storage building as defined in 22 CA Code of Regs, Div. 4.5, Chp. 34, § 67386.6(a)(2)(C).

Prevent unauthorized access to TWW using a secured enclosure such as a locked chain link fenced area or a lockable shipping container located within the job site.

Resize and segregate TWW at a location where debris from the operation including sawdust and chips can be contained. Collect and manage the debris as TWW.

Provide water-resistant labels that comply with 22 CA Code of Regs, Div. 4.5, Chp. 34, §67386.5, to clearly mark and identify TWW and accumulation areas. Labels must include:

1. Caltrans, District number, Construction, Construction Contract number
2. District office address
3. Engineer's name, address, and telephone number
4. Contractor's contact name, address and telephone number
5. Date placed in storage

#### **14-11.09C(4) Transporting and Disposal**

Before transporting TWW, obtain an agreement from the receiving facility that the TWW will be accepted. Protect shipments of TWW from loss and exposure to precipitation. For projects with 10,000 pounds or more of TWW, request a US EPA Generator Identification Number from the Engineer at least 5 business days before the first shipment. Each shipment must be accompanied by a shipping record such as a bill of lading or invoice that includes:

1. Caltrans with district number
2. Construction Contract number
3. District office address
4. Engineer's name, address, and telephone number
5. Contractor's contact name and telephone number
6. Receiving facility name and address
7. Waste description: Treated Wood Waste with preservative type if known or unknown/mixture
8. Project location
9. Estimated quantity of shipment by weight or volume
10. Date of transport
11. Date of receipt by the receiving TWW facility
12. Weight of shipment as measured by the receiving TWW facility
13. For projects with 10,000 pounds or more of TWW include the USA EPA Generator Identification Number.

The shipping record must be at least a 4-part carbon or carbonless 8 1/2 by 11-inch form to allow retention of copies by the Engineer, transporter, and disposal facility.

Dispose of TWW at an approved TWW facility. A list of currently approved TWW facilities is available at:

<http://www.dtsc.ca.gov/HazardousWaste/upload/lanfillapr11pdated1.pdf>

Dispose of TWW within:

1. 90 days of generation if stored on blocks
2. 180 days of generation if stored on a containment surface or pad
3. 1 year of generation if stored in a water-resistant container, or within 90 days after the container is full, whichever is shorter
4. 1 year of generation if storing in a storage building as defined in 22 CA Code of Regs, Div. 4.5, Chp. 34, § 67386.6(a)(2)(C)

#### **14-11.09D Payment**

Not Used

## 15 EXISTING FACILITIES

**Replace the 5th paragraph of section 15-1.01 with:**

Drainage facilities include culverts, inlets, headwalls, endwalls, aprons, drains, pipes, catch basins, gutters, gutter depressions, junction structures, spillways, sand traps and check dams.

**Replace section 15-1.03B with:**

### **15-1.03B Residue Containing Lead from Paint and Thermoplastic**

Residue from grinding or cold planing contains lead from paint and thermoplastic. The average lead concentrations are less than 1,000 mg/kg total lead and 5 mg/L soluble lead. This residue:

1. Is a nonhazardous waste
2. Does not contain heavy metals in concentrations that exceed thresholds established by the Health and Safety Code and 22 CA Code of Regs
3. Is not regulated under the Federal Resource Conservation and Recovery Act (RCRA), 42 USC § 6901 et seq.

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

Payment for a lead compliance plan is not included in the payment for existing facilities work.

Payment for handling, removal, and disposal of grinding or cold planing residue that is a nonhazardous waste is included in the payment for the type of removal work involved.

**Replace section 15-2.02B(3) with:**

### **15-2.02B(3) Cold Planing Asphalt Concrete Pavement**

#### **15-2.02B(3)(a) General**

Schedule cold planing activities so that not more than 3 days elapse between the time the pavement is cold planed and the HMA is placed.

No cold planed area shall remain exposed during weekend traffic periods and Designated Legal Holidays and Special Days.

#### **15-2.02B(3)(a)(i) Submittals**

At least 14 days prior to cold planing submit a Debris and Dust Removal Plan.

The Debris and Dust Removal Plan must include:

1. Written description of the removal of debris and dust control during and after cold planing operation
2. The number and type of equipment
3. The time of daily use of equipment
4. Contact information of Contractor's Claim or Loss Control Agent

#### **15-2.02B(3)(b) Materials**

Use the same quality of HMA for temporary tapers that is used for the HMA overlay or comply with the specifications for minor HMA in section 39.

### **15-2.02B(3)(c) Construction**

#### **15-2.02B(3)(c)(i) General**

Do not use a heating device to soften the pavement.

The cold planing machine must be:

1. Equipped with a cutter head width that matches the planing width. If the cutter head width is wider than the cold plane area shown, submit to the Engineer a request for using a wider cutter head. Do not cold plane unless the Engineer approves your request.
2. Equipped with automatic controls for the longitudinal grade and transverse slope of the cutter head and:
  - 2.1. If a ski device is used, it must be at least 30 feet long, rigid, and a 1-piece unit. The entire length must be used in activating the sensor.
  - 2.2. If referencing from existing pavement, the cold planing machine must be controlled by a self-contained grade reference system. The system must be used at or near the centerline of the roadway. On the adjacent pass with the cold planing machine, a joint-matching shoe may be used.
3. Equipped to effectively control dust generated by the planing operation
4. Operated so that no fumes or smoke is produced.
5. Bullet tooth tools with tungsten carbide steel cutting tips.
6. A maximum tool spacing of 1/4 inch.
7. New tools at the start of the job.

Replace broken, missing, or worn machine teeth.

#### **15-2.02B(3)(c)(ii) Grade Control and Surface Smoothness**

Furnish, install, and maintain grade and transverse slope references.

The depth, length, width, and shape of the cut must be as shown or as ordered. The final cut must result in a neat and uniform surface. Do not damage the remaining surface.

The completed surface of the planed asphalt concrete pavement must not vary more than 0.02 foot when measured with a 12-foot straightedge parallel with the centerline. With the straightedge at right angles to the centerline, the transverse slope of the planed surface must not vary more than 0.03 foot.

Where lanes are open to traffic, the drop-off of between adjacent lanes must not be more than 0.15 foot.

#### **15-2.02B(3)(c)(iii) Temporary HMA Tapers**

If a drop-off between the existing pavement and the planed area at transverse joints cannot be avoided before opening to traffic, construct a temporary HMA taper. The HMA temporary taper must be:

1. Placed to the level of the existing pavement and tapered on a slope of 30:1 (horizontal:vertical) or flatter to the level of the planed area
2. Compacted by any method that will produce a smooth riding surface

Completely remove temporary tapers before placing permanent surfacing.

#### **15-2.02B(3)(c)(iv) Remove Planed Material**

Remove cold planed material concurrent with planing activities so that removal does not lag more than 50 feet behind the planer.

#### **15-2.02B(3)(d) Payment**

Payment for removal of pavement markers, thermoplastic traffic stripe, painted traffic stripe, and pavement marking within the area of cold planing is included in the payment for cold plane asphalt concrete pavement of the types shown in the Bid Item List.

Payment for Debris and Dust Removal Plan is included in the payment for cold plane asphalt concrete pavement of the types shown in the Bid Item List.

**Replace section 15-2.02C(2) with:**

**15-2.02C(2) Remove Traffic Stripes and Pavement Markings Containing Lead**

Residue from removing traffic stripes and pavement markings contains lead from the paint or thermoplastic. The average lead concentrations are less than 1,000 mg/kg total lead and 5 mg/L soluble lead. This residue:

1. Is a nonhazardous waste
2. Does not contain heavy metals in concentrations that exceed thresholds established by the Health and Safety Code and 22 CA Code of Regs
3. Is not regulated under the Federal Resource Conservation and Recovery Act (RCRA), 42 USC § 6901 et seq.

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

Payment for a lead compliance plan is not included in the payment for existing facilities work.

Payment for handling, removal, and disposal of pavement residue that is a nonhazardous waste is included in the payment for the type of removal work involved.

**Replace section 15-2.02F with:**

**15-2.02F Remove Asphalt Concrete Dikes**

Before removing the dike, cut the outside edge of the asphalt concrete on a neat line and to a minimum depth of 0.17 foot.

**Replace section 15-2.02M with:**

**15-2.02M Remove Object Markers and Culvert Markers**

Remove existing object markers and culvert markers.

Full compensation for removal and disposal of existing object markers and culvert markers is included in the contract unit price paid for object marker (Type L-1) or marker (culvert) and no additional compensation will be allowed therefor.

**Replace section 15-2.03A(4) with:**

**15-2.03A(4) Payment**

Payment for salvaging covers of wells is included in the payment for destroy well.

**Replace section 15-2.04D with:**

**15-2.04D Reconstruct Metal Beam Guard Railing**

Cable anchor assemblies or terminal anchor assemblies, including concrete anchors and steel foundation tubes, must be completely removed.

Posts, blocks, and hardware must comply with section 83-1.02B.

**Replace section 15-2.06B with:**

**15-2.06B Destroy Wells**

**15-2.06B(1) General**

**15-2.06B(1)(a) Summary**

Destroying wells must comply with:

1. Regulations of El Dorado County
2. *Water Well Standards, Bulletin 74-81*
3. *Water Well Standards, Bulletin 74-90*
4. Water Code, §§ 13750.5–13753

Destroy wells after clearing and grubbing and before starting earthwork.

Where pumping equipment is present, remove the pump, motor, discharge piping, well cap, and appurtenances. Remove concrete at the wellhead.

**15-2.06B(1)(b) Submittals**

Obtain a well permit from El Dorado County. Before starting the affected work, submit the permit under section 5-1.23C.

Per the instructions from the California Department of Water Resources, submit the *Well Completion Report* form. After completion of the work and before Contract acceptance, submit a copy of your well completion report under section 5-1.23C.

**15-2.06B(2) Materials**

Unless otherwise required by El Dorado County, sealing materials must be either of the following:

1. Neat cement consisting of:
  - 1.1. 94 lb of cement
  - 1.2. Not more than 6 gal of clean water
  - 1.3. Up to 6 percent by weight of bentonite
  - 1.4. 2 percent by weight of calcium chloride
2. Bentonite clay

Do not use drilling mud.

**15-2.06B(3) Construction**

If the Engineer orders the removal of surface obstructions or materials that would interfere with destroying the well, this work is change order work. After completion of this work, do not allow material to enter the well that will obstruct or interfere with destroying the well.

Remove casing to 5 feet below grade.

Place sealing material such that it is placed in one continuous operation. Use methods that prevent jamming, bridging, free fall, or dilution. Do not allow separation of the aggregate and cement.

Completely fill the well with sealing material such that the sealing material spills over the casing.

At the time of placement, verify that the combined volume of sealing material is at least equal to the volume of the empty well.

Do not disturb the well for 48 hours after placing the sealing material.

Fill depressions around the well with native material and compact to finish grade. Native material must not contain organic matter.

**15-2.06B(4) Payment**

Not Used

**Delete the 6th paragraph of section 15-3.01.**

**Replace the 1st and 2nd paragraphs in section 15-6.01C(1) with:**

Comply with the following work sequence and notify the Engineer before you start each of the following steps:

1. Control and divert stream flow
2. Clean and prepare culvert
3. Inspect and evaluate culvert
4. Repair culvert
5. Rehabilitate culvert
6. Restoring openings
7. Perform postrehabilitation inspection

Before starting culvert work, control and divert stream flow. Maintain control and diversion until the postrehabilitation inspection report is authorized.

Keep the culvert clean and free of debris until the postrehabilitation report is authorized.

**Replace section 15-6.02 with:**

**15-6.02 FILL CULVERT VOIDS**

**15-6.02A General**

Section 15-6.02 includes specifications for filling voids below and around a culvert that have been found during cleaning and inspection.

Wherever pipeliners are shown, fill voids before installing pipeliners.

Wherever there are voids in the materials below the invert of the culvert and these voids are greater than 3 inches deep, fill the voids with slurry cement backfill.

**15-6.02B Materials**

Slurry cement backfill must comply with section 15-6.01B(1).

**15-6.02C Construction**

After receipt of the inspection and evaluation report, the Engineer may order additional void-detection work including probing and hammer sounding. Additional void-detection work is change order work.

Prevent the flow of cementitious material and water from construction activities into waterways and drainage facilities.

**15-6.02D Payment**

Filling voids below the invert of the culvert with slurry cement backfill is paid for as change order work.

Record the quantity of slurry cement backfill that is installed and submit this quantity. The Department does not pay for slurry cement backfill that leaks through to the inside of the culvert. The Department does not pay for slurry cement backfill that is wasted, disposed of, or remaining on hand after completion of the work.

**Replace "Reserved" in section 15-6.04 with:**

**15-6.04A General**

Section 15-6.04 includes specifications for preparing the surface of the culvert invert, installing bar reinforcement and anchorage devices, and paving the invert with concrete, shotcrete, or other authorized material.

**15-6.04B Materials**

Concrete must comply with the requirements for minor concrete and be placed to the thickness shown.

You may use shotcrete under section 53 or other authorized material for invert paving from the Authorized Material List as alternatives to concrete. You must use the same thickness shown for concrete.

Reinforcement and welded wire fabric must comply with section 52.

Steel angles and studs must comply with section 75-1.02.

#### **15-6.04C Construction**

Before placing invert paving, perform a mock-up field test in the presence of the Engineer to demonstrate the installation method. If the Engineer accepts the field test, you may start invert paving activities.

Before paving the invert, remove all coatings, corrosion, and other surface material until only base steel is exposed by sandblasting the portion of the culvert to be paved.

Minimum thickness must be measured over the crest of the corrugation.

Placing concrete paving must comply with the specifications for placing, finishing, and curing concrete structures in section 51-1.03.

Placing products listed on the Authorized Material List as an alternative to concrete or shotcrete must comply with the manufacturers' procedures for placing, finishing, and curing.

Placing, finishing, and curing shotcrete must comply with section 53.

#### **15-6.04D Payment**

The Department does not deduct the volume of reinforcement and miscellaneous metal from the payment quantity for invert paving.

### **Replace section 15-6.11 with:**

#### **15-6.11 CURED-IN-PLACE PIPELINERS**

##### **15-6.11A General**

##### **15-6.11A(1) Summary**

Section 15-6.11 includes specifications for lining an existing culvert by either pulling or inverting a thermosetting, resin-impregnated, flexible, fabric tube and curing the tube in place.

For all types of resin and installation methods, capture and dispose of any process water and wastewater resulting from the installation and flushing of the cured-in-place pipeliner (CIPP). Comply with section 13-4.03D(5).

##### **15-6.11A(2) Definitions**

**segment:** Continuous run of CIPP installed from one end of a culvert to the other end.

##### **15-6.11A(3) Submittals**

Submit a work plan for installing the CIPP. The work plan must include:

1. Resin sample. Submit a minimum of 4 oz of unreacted liquid resin to METS, attention Chemical Laboratory. You must include any necessary co-reactants, proposed cure method, and infrared scans of both the reacted and unreacted resin with the sample.

2. Summary sheet for each culvert. Identify the summary sheet by the structure number shown for the corresponding culvert. Summary sheets must include:
  - 2.1. Calculated minimum thickness of liner
  - 2.2. Manufacturer's recommendations for:
    - 2.2.1. Minimum pressure to hold the tube tight against the culvert
    - 2.2.2. Maximum allowable pressures to ensure no damage to the tube nor to the culvert
    - 2.2.3. Postcure temperature
    - 2.2.4. Cure pressures including the minimum cold, maximum heated, and maximum cold pressures
    - 2.2.5. Cure time including accommodations for the effects of the anticipated heat sink conditions and variation over the length of the culvert. For UV light curing include a full protocol for time, rate of travel of the UV assembly, pressures, and amount of lamps in operation for the correct curing of the fabric tube.
  - 2.3. Resin trade name
  - 2.4. Expected maximum exothermic temperature
  - 2.5. Method of liner insertion such as air inversion, water inversion, or pulled-in-place
  - 2.6. Proposed cure method such as water, UV light or hot steam
  - 2.7. Proposed length, access and termination points for each segment
3. Manufacturer's information for:
  - 3.1. Resin, resin enhancer, and bond enhancer identification and typical properties including:
    - 3.1.1. Identification of supplier
    - 3.1.2. Resin test results including infrared scans of both the reacted and unreacted resin
    - 3.1.3. Pipeliner and resin manufacturer's certification that the resin and catalyst system meets requirements of each site where CIPP will be placed and is compatible with the intended installation method, service conditions and existing culvert material including bituminous coatings
    - 3.1.4. Certificates of compliance for CIPP in compliance with ASTM F 2019, ASTM D 5813, ASTM F 1216, or ASTM F 1743
  - 3.2. Resin enhancer data including:
    - 3.2.1. Size range in microns
    - 3.2.2. Amount used in the formulated resin
    - 3.2.3. Bond-enhancing coating material
    - 3.2.4. Certification from the resin manufacturer or formulator that bond enhancer is compatible with the resin system
    - 3.2.5. Certification from the bond enhancer manufacturer that the material is suitable for use in aqueous environments
  - 3.3. Fabric tube description including:
    - 3.3.1. Identification of supplier
    - 3.3.2. Types of impermeable membranes and relative juxtaposition such as inner layer, outer layer, or both
    - 3.3.3. Maximum pulling force that will not damage fabric tube for pulled-in-place installations
  - 3.4. Installation procedure for both insertion and resin curing
  - 3.5. Sealing materials such as quick-set epoxy mortar, high viscosity epoxy, or hydrophilic vulcanized expansive rubber strip
  - 3.6. Preliner description, preliner splicing recommendations, and identification of the supplier
  - 3.7. Description of nontoxic lubricant for inversion installation. Lubricant must not (1) have any detrimental effects on the fabric tube, resin, or boiler and pump system, (2) support the growth of bacteria, and (3) adversely affect the fluid to be transported.
4. Record of annual calibration for pressure and temperature equipment performed by an independent testing agency including:
  - 4.1. Standards traceable to the National Institute of Standards and Technology
  - 4.2. Formal reporting procedure, including published test forms
  - 4.3. Sample of a temperature and pressure log to be used for monitoring the resin curing process. Logs must have temperatures for resin, water, or steam and pressure noted at 5-minute intervals. Logs must identify the date, fabric tube thickness, and drainage system number shown for the corresponding culvert.
5. Test results from an independent testing agency for 10,000-hour, 50-year flexural creep modulus test under ASTM D 2990. If authorized 10,000-hour tests are not available, for all formula calculations, use a minimum 75 percent reduction (25 percent retention) of the flexural modulus of elasticity for all

formula calculations. Determine the flexural modulus of elasticity under ASTM D 790, Procedure A, and meet the requirements of ASTM D 5813, and Table 1 within ASTM F 2019, ASTM F 1216, or ASTM F 1743.

6. Certification on manufacturer's letterhead indicating you are approved by the fabric tube and resin manufacturer to perform CIPP installation work.
7. Material safety data sheets for all hazardous chemicals that will be used on the job site including resin, catalyst, cleaners, and repair agents. Identify the proposed use for each hazardous chemical and where it will be used in the work.
8. CIPP design calculations for each culvert location. Include the drainage system number shown for the corresponding culvert and the liner thickness. Design parameters include:
  - 8.1. CIPP classification. Unless otherwise shown, classification must be Type II (partially deteriorated) under ASTM D 5813 and ASTM F 1216, Appendix X1.1.1
  - 8.2. CIPP must be designed under ASTM F 1216, Appendix X1.2.1
  - 8.3. Ovality must be assumed at 5 percent
  - 8.4. If not described otherwise, assume the groundwater level is at 1/2 the culvert depth
  - 8.5. Assume no bonding to the culvert wall

Within 21 days of completing the resin curing at a given culvert location, submit the test results from an independent testing agency. Allow 3 business days for the Department's review. The report must be signed by an engineer who represents the independent testing agency and is registered as a civil engineer in the State. The report must include:

1. Infrared spectrographic chemical fingerprint. Run and compare the infrared spectrographic chemical fingerprint of the field sample with the accepted fingerprint from the pre-installation informational submittal. Verify that the field-sample resin system is the same as the authorized resin system.
2. Flexural strength and flexural modulus test results for field samples
3. Thickness measurements for the liner using prepared core samples
4. Description of the defects in the tested samples in terms of the affect on CIPP performance

#### **15-6.11A(4) Quality Control and Assurance**

Use an authorized laboratory. The laboratory must have facilities and staff capable of performing tests including (1) tests under ASTM D 790 and (2) the infrared spectrographic chemical fingerprint. Obtain the specified samples and transport them to the authorized laboratory or have the laboratory staff sample and transport the samples.

Mark each sample with the date, contract number, drainage system number of the corresponding culvert, and location where the sample was taken.

For each CIPP segment, test one 4-oz sample of catalyzed resin and submit the following additional 4-ounce catalyzed resin samples to METS, attention Chemical Laboratory:

1. Sample from the 1st segment
2. One sample randomly selected by the Engineer from the next 5 segments. If less than 5 segments remain, sample from one of the remaining segments.

Make cured samples from the identical materials (tube, resin and catalyst) to be used for the CIPP. Identify each sample by date, contract number, drainage system number of the corresponding culvert, thickness, name of resin, and name of catalyst.

The samples must be 6 by 16 inches in size: Comply with the following sampling procedures unless UV cured:

1. Place 3 aluminum-plate clamped molds, each containing a flat plate sample, inside the downtube when heated circulated water is used, and in the silencer when steam is used during the resin curing period
2. Seal each flat plate sample in heavy-duty plastic envelope inside the mold
3. Remove the 3 cured flat plate samples after draining all of the moisture from the cured CIPP

If UV cured, comply with field sampling procedures under ASTM F 2019, Section 7: Recommended Inspection Practices.

Test the samples for flexural properties under ASTM D 790, ASTM D 5813, ASTM F 1216, ASTM F 1743, or ASTM F 2019. Verify that physical properties of the field samples comply with the minimum initial test values under:

1. ASTM F 1216, Table 1, and as supplemented in Table 1 for heat cured polyester, vinylester, and epoxy resins. The flexural strength must be at least 4,500 psi. The flexural modulus must be at least 250,000 psi.
2. ASTM F 2019, Table 1, and as supplemented in Table 1 for UV cured CIPP. The flexural strength must be at least 6,500 psi. The flexural modulus must be at least 725,000 psi. Comply with sampling and testing procedures under ASTM F 2019, Section 7: Recommended Inspection Practices.

Take core samples in the presence of the Engineer. Comply with the following core sample requirements:

1. Take 2 samples. Take the samples at least 10 feet from each end of the culvert or termination point and at a location near the top of the culvert. Samples must be at least 2 inches in diameter. Take the samples from the top of the culvert unless a minimum wall thickness is specified in section 15-6.11B(1). If a minimum wall thickness is specified in section 15-6.11B(1), take the samples as near as possible to the bottom of the culvert.
2. If human entry is used, samples may be cored internally. Repair cored holes under section 15-6.11C(5). Patch cored holes in the culvert with cement mortar under section 65-1.02F.
3. As an alternative, you may core samples from the top section of a CIPP that has been inverted using the same type of preliner through a pipe temporarily connected to the culvert. Take the cores 12 inches from the temporary joint. The pipe temporarily jointed to the culvert must be:
  - 3.1. Same diameter as the culvert
  - 3.2. Made of the same material as the culvert
  - 3.3. At least 10 feet long
  - 3.4. Placed at the end of the culvert and held in place by a suitable heat sink, such as sandbags or earth, that is at least 6 inches thick.
4. If culvert material is corrugated metal, obtain samples at the corrugation crests.

Prepare the core samples by separating the CIPP material from the culvert material. If heat cured, remove the film from the inner lining or preliner.

If UV cured, remove the film from the inner and outer foil.

Measure the thickness of the liner at 3 spots on each sample. If the culvert material is corrugated metal, measure the thickness at 3 spots that are along a line corresponding to the corrugation crests. Calculate the thickness as an average of at least 6 measurements.

If UV cured, comply with core sample requirements under 15-6.11A(4) and sampling and testing procedures under ASTM F 2019, Section 7: Recommended Inspection Practices. If the culvert material is corrugated metal, measure the thickness at 3 spots that are along a line corresponding to the corrugation crests. Calculate the thickness as an average of at least 6 measurements.

CIPP will be rejected if:

1. Actual temperature and curing time and schedule do not comply with those shown in the authorized work plan
2. Pressure deviates more than 1 psi from the required pressure
3. At any time during installation you violate the manufacturer's required minimum cool-down time or cool-down rate
4. There are defects including:
  - 4.1. Concentrated ridges, including folds and wrinkles exceeding 8 percent of the CIPP diameter
  - 4.2. Dry spots
  - 4.3. Lifts
  - 4.4. Holes
  - 4.5. Tears
  - 4.6. Soft spots
  - 4.7. Blisters or bubbles
  - 4.8. Delaminations
  - 4.9. Gaps in the length of the CIPP

- 4.10. Gaps or a loose fit between the exterior of the CIPP and the culvert
- 5. Test results indicate one of the following:
  - 5.1. If heat cured, 2 of the 3 flat plate samples do not have the specified modulus of elasticity
  - 5.2. If heat cured, 2 of the 3 flat plate samples do not have the specified flexural strength
  - 5.3. If heat cured, 2 of the 3 flat plate samples do not have either the specified modulus of elasticity or the specified flexural strength
  - 5.4. If UV cured, 2 of the 3 cured samples do not have the specified modulus of elasticity
  - 5.5. If UV cured, 2 of the 3 cured samples do not have the specified flexural strength
  - 5.6. If UV cured, 2 of the 3 cured samples do not have either the specified modulus of elasticity or the specified flexural strength
- 6. The liner thickness is less than the greater of either one of the following:
  - 6.1. Specified thickness
  - 6.2. Calculated minimum thickness shown in your authorized work plan
- 7. Materials and installation methods are not those shown in your authorized installation plan
- 8. Defects are excessive or unrepairable
- 9. CIPP is not continuous or does not fit tightly for the full length of the culvert

### **15-6.11B Materials**

#### **15-6.11B(1) General**

CIPP must comply with ASTM D 5813 or ASTM F 2019.

The fabric tube must consist of 1 or more layers of flexible, needled, polyester-fiber felt, an equivalent nonwoven material, or a combination of nonwoven and woven materials including reinforcing fibers and fabrics capable of carrying the resin, or at least 2 separate tubes made of corrosion resistant (E-CR or equivalent) glass fibers that comply with ASTM D 578. The fabric tube must:

- 1. Withstand installation pressures and curing temperatures
- 2. Be compatible with the resin system used and be capable of stretching to fit irregular pipe sections and negotiate bends
- 3. Have staggered longitudinal and circumferential joints between multiple layers of fabric so as not to overlap
- 4. Be fabricated to a size so that when installed it fits tightly in the internal circumference and length of the culvert
- 5. Have an impermeable, plastic, inner liner or outer liner film, or both for resin control. The liner must remain a permanent part of the system and an integral part of the fabric tube by bonding or fusing to the fabric tube.
- 6. Have a plastic coating with opacity that does not interfere with visual inspection
- 7. Have outer plastic coating that is impermeable to all wave lengths of light relevant to curing if CIPP is to be UV cured.

#### **15-6.11B(2) Inversion Fabric Tube and Preliner Tube**

Upon delivery, the outside layer of the fabric tube must be plastic coated with a material that is compatible with the resin system. Make allowance for circumferential stretching during inversion. Use a preliner tube sized to fit the culvert. The preliner tube must be composed of 3-ply laminate sheet combining two layers of polyethylene film and high-strength-nylon cord grid formed into a tube. The tube must be (1) sized to fit the culvert and (2) continuous for the entire length of the culvert.

#### **15-6.11B(3) Pulled-In-Place Fabric Tube**

The outside layer of fabric tube must have an impermeable plastic coating to contain the resin during and after fabric tube impregnation. Make allowance for circumferential and longitudinal stretching during installation. The minimum tensile strength of the fabric tube or reinforced fiber material in the longitudinal and transverse directions must be 750 psi when tested under ASTM D 5034 and ASTM D 5035.

#### **15-6.11B(4) Resin System**

Resin must be compatible with the installation process. Resin must be capable of curing in the presence and absence of water. The initiation temperature for curing must be less than 180 degrees F for heat cured systems. Resin must be one of the following:

1. Chemically resistant isophthalic-based polyester resin
2. Vinyl ester resin and catalyst system
3. Epoxy resin and hardener

Thixotropic agents that do not interfere with visual inspection may be added for viscosity control. Resins may contain pigments, dyes, or colors that do not interfere with visual inspection of the resin-impregnated liner or its required properties. Resin must not contain fillers except those required for viscosity control, fire retardance, air release, and extension of pot life. For UV-light cured systems a photo-initiator system must be added to the resin prior to the impregnation. The photo-initiator system must be tuned to the UV-curing equipment used or vice-versa.

The resin system must be manufactured by a company selected by the fabric tube manufacturer. Resin must be one the following types of corrosion-resistant resin systems:

1. Polyester resin that:
  - 1.1. Is created by condensation reactions between isophthalic/terathalic acid, maleic anhydride, and a glycol. Polymeric product is characterized by reactive unsaturation located along the molecular chain. This resin is compounded with a reactive styrene monomer and reacted together with initiators/promoters to produce cross-linked copolymer matrices.
  - 1.2. Contains only branched glycols, including propylene glycol and neopentyle glycol. PET/isophthalic polyester must not be used. Polyesters may be either virgin isophthalic acid or virgin teraphthalic acid but not a combination of both.
2. Vinyl ester resin. This resin is created from the products of reactions of epoxy resins with methacrylic acid and characterized by reactive unsaturation located in the terminal position of the molecular chain. It is compounded with a reactive styrene monomer and reacted together with initiators or promoters to produce cross-linked copolymer matrices.
3. Epoxy resin that:
  - 3.1. Is created by the reaction of epichlorohydrin and Bisphenol-A, Bispehnol-F, or Novalac to yield a diglycidyl ether or triglycidyl ether. It has terminal epoxy rings as the reactive sites.
  - 3.2. Must be composed of a diglycidyl ether of Bisphen-A (DGE BPA) or Bisphenol-F (DGE BPF) resin solution, or a mixture of both, and a curing agent compatible with the saturation and cure methods for cured-in-place pipeliner. The curing agent may be a catalytic type, an addition-curing agent type, or a mixture of both, as specified and proportioned under the manufacturer's formulation. The epoxy resin system must be free of volatile organic compounds, be insensitive to UV light rays, and have low odor. It must comply with Title 8 of CA Code of Reg, subchapter 7, and have a flash point classification as a combustible liquid at 100 degrees F or higher. Sampling and testing must comply with section 95-1.

Resin enhancer may be used. The maximum amount of enhancer allowed is 30 lbs of enhancer per 100 lbs resin. Submit data to certify that the resin enhancer does not exceed the maximum amount. Enhancer material must be made in a batch method and attested to by the manufacturer.

If using aluminum trihydride or fiberglass-reinforced felt, use a suitable bond-enhancing compound, such as silane or an equivalent, to increase the bond between the resin and other material.

#### **15-16.11C Construction**

##### **15-6.11C(1) General**

For each culvert location and for each drainage system, notify the Engineer 2 business days before starting resin impregnation.

Obtain authorization before starting the installation of any pipeliner segment. The Engineer may require the submittal of all test results for 1 segment before allowing installation of another segment.

Before starting resin impregnation, inspect the entire fabric tube for defects. The fabric tube must be either (1) vacuum-impregnated with resin (wet-out) under controlled conditions or (2) impregnated with resin and run through a set of rollers separated by a space and calibrated under controlled conditions to ensure proper distribution of resin. The volume of resin must be enough to fully saturate the voids in the fabric tube material, including all resin-absorbing material of the calibration hose if applicable. Attach to the impregnated fabric tube certification of:

1. Date
2. Type of resin
3. Resin manufacturer, trade name and lot number
4. Resin calculation
5. Volume of resin used

The impregnated fabric tube must be stored in an area where the temperature is controlled to 70 degrees F or less for heat cured resins, or between 45 and 95 degrees F for UV cured resins.

Comply with the following:

1. Before installing the liner, place an impermeable plastic sheet 20 linear feet immediately upstream and downstream of the culvert. The impermeable plastic sheet must be either (1) at least 10 mil thick or (2) the same material as required for the preliner tube.
2. Capture any spillage of raw resin during installation.
3. If using pulled-in-place installation, install a semi-rigid, plastic slip sheet over the interior portions of the culvert that (1) could tear the outer film or (2) have a significant void.
4. Promptly repair all pinholes and tears in the plastic film or preliner. If these defective areas cannot be repaired, promptly replace the impermeable plastic film or preliner before proceeding with liner installation.
5. Remove and properly dispose of all waste materials.

#### **15-6.11C(2) Inversion Installation**

CIPP installation by inversion must comply with ASTM F 1216.

Install each preliner tube in the presence of the Engineer. The preliner tube must control resin loss and liner thickness and prevent blocked laterals. For long segments, several sections of preliner tube may be spliced together in compliance with the preliner manufacturer's instructions for forming a tube of adequate length.

If you fail to install the required preliner tube over the entire segment, you must remove the CIPP from the culvert.

Turn the fabric tube's end inside out and attach it to a platform ring or standpipe. Adjust the pressure of water or steam to cause the impregnated fabric tube to invert end to end and to hold tight against the culvert wall.

During inversion, maintain a pressure between the required minimum and maximum pressures. If at any time during the installation you violate the manufacturer's required minimum and maximum pressures, you must remove the tube from the culvert.

Use a lubricant during inversion to reduce friction. Lubricant must be poured into the inversion water in the down tube or applied directly to the tube. Lubricant must:

1. Be nontoxic
2. Not have any detrimental effect on tube, resin, and boiler and pump system
3. Not support the growth of bacteria
4. Not adversely affect the fluid to be transported

#### **15-6.11C(3) Pulled-in-Place Installation**

CIPP installation by pulling-in-place must comply with ASTM F 1743 or ASTM F 2019.

Winch the fabric tube into position using the manufacturer's instructions. Adjust the pressure of water, air, or steam to cause the calibration hose to invert the tube end to end and hold tight against the culvert wall.

#### **15-6.11C(4) Resin Curing**

##### **15-6.11C(4)(a) General**

Start resin curing by using either heat or pressure and complete the cure with a cool-down period for heat curing resin based CIPP. If UV cured, comply with curing procedures under ASTM F 2019.

##### **15-6.11C(4)(b) Heat Cure**

After installing the CIPP, use a suitable heat source that is either hot water, steam, or steam with air. The delivery system must be capable of providing the required amount of heat uniformly throughout the section to completely cure the resin. Monitor the temperature throughout the curing process by:

1. Installing gages to measure the temperature of the incoming and outgoing heat source.
2. Placing remote sensing devices at both ends between the impregnated tube and the culvert invert to monitor the outside temperature of the CIPP.
3. Recording the temperature from each remote sensing device on a continuous tape from a strip-chart recorder. The tape readings must represent the temperature from start to completion of the resin-curing process and draining the CIPP.
4. Recording temperature every 5 minutes.

Submit the tape and log of recorded temperatures within 48 hours after completing the resin-curing process.

Initial curing is complete when the remote sensing devices achieve the manufacturer's required curing temperatures for either resin, catalyst, or both. The curing temperature and schedule must comply with the submitted data and cool-down period.

##### **15-6.11C(4)(c) Pressure**

Start the resin-curing process after you complete dimpling of the culvert openings. Maintain the required pressure until the resin-curing process is complete. Monitor the pressure throughout the curing process and record the pressure every 5 minutes.

Submit the recorded pressure within 48 hours after completing the resin-curing process.

##### **15-6.11C(4)(d) UV Cure**

UV curing must conform to ASTM F 2019, Section 6.7 Curing Methods-Ultraviolet Light Curing.

##### **15-6.11C(4)(e) Cool Down for Heat Cured Resins**

Before relieving pressure, cool the hardened CIPP to below 100 degrees F. Cool per the manufacturer's instructions. The cool-down rate must not exceed 15 to 20 degrees F/hour.

You may add cool water to the water column while maintaining circulation as the water is drained from a small hole at the opposite end of the CIPP. Maintain constant water-column height until cool-down is completed. Do not let a vacuum develop during the release of the water column.

##### **15-6.11C(5) Repairs**

As an alternative to replacing a rejected CIPP, you may request authorization to repair the CIPP. Submit a work plan for repairs and include adequate information to describe the repair work such as specified for an installation plan. If the repair plan is not authorized, replace the CIPP.

Authorization may be given for the defects and corresponding repair methods shown in the following table:

### CIPP Repairs

Defect	Repair method
CIPP thickness is less than the specified thickness or the calculated minimum thickness	Remove and replace the CIPP. If groundwater conditions allow, you may install a second CIPP within the first CIPP that produces a similar dimension ratio to the first CIPP or use procedures in the authorized repair plan.
Concentrated ridges in the CIPP	If concentrated ridges fall outside the 120-degree invert arc and you demonstrate that grinding does not compromise the CIPP's structural integrity or reduce its thickness below the submitted, calculated minimum thickness, you may grind the concentrated ridges to the required tolerance. After grinding to the required tolerance, coat the ground area with the manufacturer's approved resin. At the end of each work day, dispose of any residue generated from grinding.
CIPP does not fit tightly against the culvert at the termination point	Fill the space between the CIPP and culvert with either of the following: 1. Quick-set epoxy mortar 2. High viscosity epoxy 3. Hydrophilic vulcanized expansive rubber strip
Wrinkles or ridges exceeding 5% and up to 8% of pipe diameter outside of the 120-degree invert arc	Grind to the required tolerance
Wrinkles or ridges exceeding 2% and up to 8% of pipe diameter inside of the 120-degree invert arc except corrugations in CMP	Grind to the required tolerance within the lower 120 degrees of pipe to remove wrinkles or ridges and point repair where needed to maintain the minimum thickness or use procedures in the authorized repair plan
Wrinkles or ridges exceed 8% of the pipe diameter	Remove and replace the CIPP
Holes, tears, soft spots, and lifts up to 6 inches in major dimension	Make point repairs under the manufacturer's instructions
Delaminated areas up to 12 inches in major dimension; blistering or bubbling of the coating present on over a maximum of 5% of the CIPP's surface area	Make point repairs under the manufacturer's instructions
Annular space at the lateral connection or at the end of the CIPP or infiltration at the lateral opening	Seal with quick-set epoxy mortar, high-viscosity epoxy or a hydrophilic vulcanized expansive rubber strip

#### 15-6.11C(6) Restore Openings

Restore openings. Comply with

1. ASTM F 1216 Section 7.9
2. ASTM F 1743 Section 6.9
3. ASTM F 2019

#### 15-6.11D Payment

Not Used



**Add to section 20:**

**20-16 LOG**

**20-16.01 GENERAL**

**20-16.01A Summary**

Section 20-16 includes specifications for log locating, pruning and removal, transporting, storage and protecting, and installation of logs at the location areas shown.

**20-16.02B Submittals**

If log material is to be retrieved from clearing and grubbing operations, submit a written plan prior to start of clearing and grubbing operations otherwise submit plan prior to log transporting. Plan will include but not be limited to:

1. Locating.
2. Pruning and removal.
3. Transporting, storage and protecting.
4. Installation procedures

**20-16.02 MATERIALS**

Logs must be from trees predominant to the job site. Logs must at least 12 inches in diameter and be from 12 to 18 feet in length. All branches are to be removed from logs.

**20-16.03 CONSTRUCTION**

Prior to placement of logs, mark the proposed locations of the logs within the log area shown and the Engineer will accept the location and log orientation.

**20-16.04 PAYMENT**

Not Used.

**Add to section 20:**

**20-17 BOULDER**

**20-17.01 GENERAL**

Section 20-17 includes specifications for protecting, transporting and placement of boulders.

**20-17.02 MATERIALS**

**20-17.02A General**

Obtain boulders from a source approved by the Engineer. Protect boulders from cracking, splitting or spalling during transportation and placement. Boulders that are damaged must be replaced in-kind at your expense.

**20-17.02B Boulder**

Boulders must be Sierra Black or White Granite and conform to the following:

Type	Approximate Weight (pounds)	Approximate Spherical Diameter (feet)
A	8240	5
B	4219	4
C	1780	3
D	527	2

**20-17.03 CONSTRUCTION**

Prior to placement of boulders, mark the proposed locations of the boulders within the boulder area shown and the Engineer will accept the locations. Align boulders in the same general direction.

**20-17.04 PAYMENT**

Not Used.

AA

## 21 EROSION CONTROL

**Replace the 1st paragraph of section 21-1.02I with:**

Straw must be pine needles.

**Add to section 21-1.02R:**

Earth anchors must be aluminum, stainless steel or galvanized materials capable of holding a capacity of at least 400 pounds. Anchors must be cast with chiseled tips. You must provide, assure, and ensure proper anchor selection and installation per plan and manufactures recommendations. If requested, in the presence of the Engineer you must test anchor resistance force by use of mechanical equipment. Obtruding anchor components remaining above the ground surface after installation must be removed or secured.

AA

## DIVISION V SURFACINGS AND PAVEMENTS

### 39 HOT MIX ASPHALT

**Add to section 39-1.11D of the RSS for section 39-1.11:**

Place shoulder conform tapers concurrently with the adjacent lane's paving.

Place additional HMA along the pavement's edge to conform to road connections and driveways. Hand rake, if necessary, and compact the additional HMA to form a smooth conform taper.

**Replace section 39-1.17 with:**

#### 39-1.17 DATA CORES

##### 39-1.17A General

##### 39-1.17A(1) Summary

This work includes taking data cores and submitting the information.

Three business days before starting coring, submit proposed methods and materials for backfilling data core holes.

##### 39-1.17A(2) Submittals

Submit the following to the Engineer and to Coring@dot.ca.gov:

1. Summary of data cores taken
2. Photograph of each data core

For each data core, the summary must include:

1. Project identification number
2. Date cored
3. Core identification number
4. Type of materials recovered
5. Type and approximate thickness of unstabilized material not recovered
6. Total core thickness
7. Thickness of each individual material to within:
  - 7.1 1/2 inch for recovered material
  - 7.2 1.0 inch for unstabilized material
8. Location including:
  - 8.1. County
  - 8.2. Route
  - 8.3. Post mile
  - 8.4. Lane number
  - 8.5. Lane direction
  - 8.6. Station

Each data core digital photograph must include a ruler laid next to the data core. Each photograph must include:

1. Core
2. Project identification number
3. Core identification number
4. Date cored
5. County
6. Route
7. Post mile
8. Lane number
9. Lane direction

#### **39-1.17B Materials**

Not Used

#### **39-1.17C Construction**

Take data cores that include the completed HMA pavement, underlying base, and subbase material. Protect data cores and surrounding pavement from damage.

Take 4- or 6-inch-diameter data cores:

1. At the beginning, end, and every 1/2 mile within the paving limits of each route on the project
2. After all paving is complete
3. From the center of the specified lane

On a 2-lane roadway, take data cores from either lane. On a 4-lane roadway, take data cores from each direction in the outermost lane. On a roadway with more than 4 lanes, take data cores from the median lane and the outermost lane in each direction.

Each core must include the stabilized materials encountered. You may choose not to recover unstabilized material, but you must identify the material. Unstabilized material includes:

1. Granular material
2. Crumbled or cracked stabilized material
3. Sandy or clayey soil

After submitting the data core summary and photograph, dispose of cores.

**Replace section 39-1.18 with:**

**39-1.18 HOT MIX ASPHALT AGGREGATE LIME TREATMENT—DRY LIME METHOD**

**39-1.18A General**

**39-1.18A(1) Summary**

Treat HMA aggregate with lime using the dry lime method either with marination or without.

Treat aggregate for HMA Type A-WMA with dry lime.

**39-1.18A(2) Submittals**

Determine the exact lime proportions for fine and coarse virgin aggregate and submit them as part of the proposed JMF.

If marination is required, submit the averaged aggregate quality test results within 24 hours of sampling.

Submit a treatment data log from the dry lime and aggregate proportioning device in the following order:

1. Treatment date
2. Time of day the data is captured
3. Aggregate size being treated
4. HMA type and mix aggregate size
5. Wet aggregate flow rate collected directly from the aggregate weigh belt
6. Aggregate moisture content, expressed as a percent of the dry aggregate weight
7. Flow rate of dry aggregate calculated from the flow rate of wet aggregate
8. Dry lime flow rate
9. Lime ratio from the accepted JMF for each aggregate size being treated
10. Lime ratio from the accepted JMF for the combined aggregate
11. Actual lime ratio calculated from the aggregate weigh belt output, the aggregate moisture input, and the dry lime meter output, expressed as a percent of the dry aggregate weight
12. Calculated difference between the authorized lime ratio and the actual lime ratio

Each day during lime treatment, submit the treatment data log on electronic media in tab delimited format on a removable CD-ROM storage disk. Each continuous treatment data set must be a separate record using a line feed carriage return to present the specified data on 1 line. The reported data must include data titles at least once per report.

**39-1.18A(3) Quality Control and Assurance**

If marination is required, the QC plan must include aggregate quality control sampling and testing during lime treatment. Sample and test in compliance with minimum frequencies shown in the following table:

**Aggregate Quality Control During Lime Treatment**

Quality characteristic	Test method	Minimum sampling and testing frequency
Sand equivalent	California Test 217	Once per 1,000 tons of aggregate treated with lime
Percent of crushed particles	California Test 205	As necessary and as designated in the QC plan
Los Angeles Rattler	California Test 211	
Fine aggregate angularity	California Test 234	
Flat and elongated particles	California Test 235	

Note: During lime treatment, sample coarse and fine aggregate from individual stockpiles. Combine aggregate in the JMF proportions. Run tests for aggregate quality in triplicate and report test results as the average of 3 tests.

For any of the following, the Engineer orders proportioning operations stopped if you:

1. Do not submit the treatment data log
2. Do not submit the aggregate quality control data for marinated aggregate
3. Submit incomplete, untimely, or incorrectly formatted data
4. Do not take corrective actions
5. Take late or unsuccessful corrective actions
6. Do not stop treatment when proportioning tolerances are exceeded
7. Use malfunctioning or failed proportioning devices

If you stop treatment, notify the Engineer of any corrective actions taken and conduct a successful 20-minute test run before resuming treatment.

**39-1.18B Materials**

High-calcium hydrated lime and water must comply with section 24-2.02.

Before virgin aggregate is treated, it must comply with the aggregate quality specifications. Do not test treated aggregate for quality control except for gradation. The Department does not test treated aggregate for acceptance except for gradation.

The Engineer determines the combined aggregate gradation during HMA production after you have treated the aggregate.

Treated aggregate must not have lime balls or clods.

**39-1.18C Construction**

**39-1.18C(1) General**

Notify the Engineer at least 24 hours before the start of aggregate treatment.

Do not treat RAP.

Marinate aggregate if the plasticity index determined under California Test 204 is from 4 to 10.

If marination is required:

1. Treat and marinate coarse and fine aggregates separately.
2. Treat the aggregate and stockpile for marination only once.
3. Treat the aggregate separate from HMA production.

The lime ratio is the pounds of dry hydrated lime per 100 lb of dry virgin aggregate expressed as a percentage. Water content of slurry or untreated aggregate must not affect the lime ratio.

Aggregate gradations must have the lime ratio ranges shown in the following table:

Aggregate gradation	Lime ratio percent
Coarse	0.4–1.0
Fine	1.5–2.0
Combined	0.8–1.5

The lime ratio for fine and coarse aggregate must be within  $\pm 0.2$  percent of the lime ratio in the accepted JMF. The lime ratio must be within  $\pm 0.2$  percent of the authorized lime ratio when you combine the individual aggregate sizes in the JMF proportions.

Proportion dry lime by weight with a continuous operation.

The device controlling dry lime and aggregate proportioning must produce a treatment data log. The log consists of a series of data sets captured at 10-minute intervals throughout daily treatment. The data must be a treatment activity register and not a summation. The material represented by a data set is the quantity produced 5 minutes before and 5 minutes after the capture time. For the duration of the Contract, collected data must be stored by the controller.

If 3 consecutive sets of recorded treatment data indicate deviation more than 0.2 percent above or below the lime ratio in the accepted JMF, stop treatment.

If a set of recorded treatment data indicates a deviation of more than 0.4 percent above or below the lime ratio in the accepted JMF, stop treatment and do not use the material represented by that set of data in HMA.

If 20 percent or more of the total daily treatment indicates deviation of more than 0.2 percent above or below the lime ratio in the accepted JMF, stop treatment and do not use the day's treated aggregate in HMA.

If you stop treatment for noncompliance, you must implement corrective action and successfully treat aggregate for a 20-minute period. Notify the Engineer before beginning the 20-minute treatment period.

If you use a batch-type proportioning operation for HMA production, control proportioning in compliance with the specifications for continuous mixing plants. Use a separate dry lime aggregate treatment operation from HMA batching operations including:

1. Pugmill mixer
2. Controller
3. Weigh belt for the lime
4. Weigh belt for the aggregate

If using a continuous mixing operation for HMA without lime marinated aggregates, use a controller that measures the blended aggregate weight after any additional water is added to the mixture. The controller must determine the quantity of lime added to the aggregate from the aggregate weigh belt input in connection with the manually input total aggregate moisture, the manually input target lime content, and the lime proportioning system output. Use a continuous aggregate weigh belt and pugmill mixer for the lime treatment operation in addition to the weigh belt for the aggregate proportioning to asphalt binder in the HMA plant. If you use a water meter for moisture control for lime treatment, the meter must comply with California Test 109.

At the time of mixing dry lime with aggregate, the aggregate moisture content must ensure complete lime coating. The aggregate moisture content must not cause aggregate to be lost between the point of weighing the combined aggregate continuous stream and the dryer. Add water for mixing and coating aggregate to the aggregate before dry lime addition. Immediately before mixing lime with aggregate, water must not visibly separate from aggregate.

The HMA plant must be equipped with a bag-house dust system. Material collected in the dust system must be returned to the mix.

### **39-1.18C(2) Mixing Dry Lime and Aggregate**

Mix aggregate, water, and dry lime with a continuous pugmill mixer with twin shafts. Immediately before mixing lime with aggregate, water must not visibly separate from the aggregate. Store dry lime in a uniform and free-flowing condition. Introduce dry lime to the pugmill in a continuous operation. The introduction must occur after the aggregate cold feed and before the point of proportioning across a weigh belt and the aggregate dryer. Prevent loss of dry lime.

If marination is required, marinate treated aggregate in stockpiles from 24 hours to 60 days before using in HMA. Do not use aggregate marinated more than 60 days.

The pugmill must be equipped with paddles arranged to provide sufficient mixing action and mixture movement. The pugmill must produce a homogeneous mixture of uniformly coated aggregates at mixer discharge.

If the aggregate treatment operation is stopped longer than 1 hour, clean the equipment of partially treated aggregate and lime.

Aggregate must be completely treated before introduction into the mixing drum.

#### **39-1.18D Payment**

Payment for dry lime treating the aggregate, including marination, is included in payment for the HMA involved.

#### **Replace section 39-1.19 with:**

#### **39-1.19 HOT MIX ASPHALT AGGREGATE LIME TREATMENT—SLURRY METHOD**

##### **39-1.19A General**

##### **39-1.19A(1) Summary**

Treat HMA aggregate with lime using the slurry method and place it in stockpiles to marinate.

Treat aggregate for HMA Type A-WMA with lime slurry.

##### **39-1.19A(2) Submittals**

Determine the exact lime proportions for fine and coarse virgin aggregate and submit them as part of the proposed JMF.

Submit the averaged aggregate quality test results to the Engineer within 24 hours of sampling.

Submit a treatment data log from the slurry proportioning device in the following order:

1. Treatment date
2. Time of day the data is captured
3. Aggregate size being treated
4. Wet aggregate flow rate collected directly from the aggregate weigh belt
5. Moisture content of the aggregate just before treatment, expressed as a percent of the dry aggregate weight
6. Dry aggregate flow rate calculated from the wet aggregate flow rate
7. Lime slurry flow rate measured by the slurry meter
8. Dry lime flow rate calculated from the slurry meter output
9. Authorized lime ratio for each aggregate size being treated
10. Actual lime ratio calculated from the aggregate weigh belt and the slurry meter output, expressed as a percent of the dry aggregate weight
11. Calculated difference between the authorized lime ratio and the actual lime ratio
12. Dry lime and water proportions at the slurry treatment time

Every day during lime treatment, submit the treatment data log on electronic media in tab delimited format on a removable CD-ROM storage disk. Each continuous treatment data set must be a separate record using a line feed carriage return to present the specified data on 1 line. The reported data must include data titles at least once per report.

##### **39-1.19A(3) Quality Control and Assurance**

The QC plan must include aggregate quality control sampling and testing during aggregate lime treatment. Sample and test in compliance with frequencies in the following table:

**Aggregate Quality Control During Lime Treatment**

Quality characteristic	Test method	Minimum sampling and testing frequency
Sand equivalent	California Test 217	Once per 1,000 tons of aggregate treated with lime
Percent of crushed particles	California Test 205	As necessary and as designated in the QC plan
Los Angeles Rattler	California Test 211	
Fine aggregate angularity	California Test 234	
Flat and elongated particles	California Test 235	

Note: During lime treatment, sample coarse and fine aggregate from individual stockpiles. Combine aggregate in the JMF proportions. Run tests for aggregate quality in triplicate and report test results as the average of 3 tests.

For any of the following, the Engineer orders proportioning operations stopped if you:

1. Do not submit the treatment data log
2. Do not submit the aggregate quality control data
3. Submit incomplete, untimely, or incorrectly formatted data
4. Do not take corrective actions
5. Take late or unsuccessful corrective actions
6. Do not stop treatment when proportioning tolerances are exceeded
7. Use malfunctioning or failed proportioning devices

If you stop treatment, notify the Engineer of any corrective actions taken and conduct a successful 20-minute test run before resuming treatment.

For the aggregate to be treated, determine the moisture content at least once during each 2 hours of treatment. Calculate moisture content under California Test 226 or 370 and report it as a percent of dry aggregate weight. Use the moisture content calculations as a set point for the proportioning process controller.

**39-1.19B Materials**

High-calcium hydrated lime and water must comply with section 24-2.02.

Before virgin aggregate is treated, it must comply with the aggregate quality specifications. Do not test treated aggregate for quality control except for gradation. The Engineer does not test treated aggregate for acceptance except for gradation.

The Engineer determines the combined aggregate gradation during HMA production after you have treated the aggregate. If RAP is used, the Engineer determines combined aggregate gradations containing RAP under Laboratory Procedure LP-9.

Treated aggregate must not have lime balls or clods.

**39-1.19C Construction**

**39-1.19C(1) General**

Notify the Engineer at least 24 hours before the start of aggregate treatment.

Treat aggregate separate from HMA production.

Do not treat RAP.

Add lime to the aggregate as slurry consisting of mixed dry lime and water at a ratio of 1 part lime to from 2 to 3 parts water by weight. The slurry must completely coat the aggregate.

Lime treat and marinate coarse and fine aggregates separately.

Immediately before mixing lime slurry with the aggregate, water must not visibly separate from the aggregate.

Treat the aggregate and stockpile for marination only once.

The lime ratio is the pounds of dry hydrated lime per 100 lb of dry virgin aggregate expressed as a percentage. Water content of slurry or untreated aggregate must not affect the lime ratio.

The following aggregate gradations must have the lime ratio ranges shown in the following table:

Aggregate gradation	Lime ratio percent
Coarse	0.4–1.0
Fine	1.5–2.0
Combined virgin aggregate	0.8–1.5

The lime ratio for fine and coarse aggregate must be within  $\pm 0.2$  percent of the lime ratio in the accepted JMF. The lime ratio must be within  $\pm 0.2$  percent of the authorized lime ratio when you combine the individual aggregate sizes in the JMF proportions. The lime ratio must be determined before the addition of RAP.

If 3 consecutive sets of recorded treatment data indicate deviation more than 0.2 percent above or below the lime ratio in the accepted JMF, stop treatment.

If a set of recorded treatment data indicates a deviation of more than 0.4 percent above or below the lime ratio in the accepted JMF, stop treatment and do not use the material represented by that set of data in HMA.

If 20 percent or more of the total daily treatment indicates deviation of more than 0.2 percent above or below the lime ratio in the accepted JMF, stop treatment and do not use the day's total treatment in HMA.

If you stop treatment for noncompliance, you must implement corrective action and successfully treat aggregate for a 20-minute period. Notify the Engineer before beginning the 20-minute treatment period.

### **39-1.19C(2) Lime Slurry Proportioning**

Proportion lime and water with a continuous or batch operation.

The device controlling slurry proportioning must produce a treatment data log. The log consists of a series of data sets captured at 10-minute intervals throughout daily treatment. The data must be a treatment activity register and not a summation. The material represented by the data set is the quantity produced 5 minutes before and 5 minutes after the capture time. For the Contract's duration, collected data must be stored by the controller.

### **39-1.19C(3) Proportioning and Mixing Lime Slurry Treated Aggregate**

Treat HMA aggregate by proportioning lime slurry and aggregate by weight in a continuous operation.

Marinate treated aggregate in stockpiles from 24 hours to 60 days before using in HMA. Do not use aggregate marinated longer than 60 days.

### **39-1.19D Payment**

Payment for treating aggregates with lime slurry is included in payment for the HMA involved.

**Replace section 39-1.20 with:**

**39-1.20 LIQUID ANTISTRIP TREATMENT**

**39-1.20A General**

**39-1.20A(1) Summary**

Treat asphalt binder with liquid antistrip (LAS) treatment to bond the asphalt binder to aggregate in HMA.

**39-1.20A(2) Submittals**

For LAS, submit with the proposed JMF submittal:

1. MSDS
2. One 1-pint sample
3. Infrared analysis including copy of absorption spectra

Submit a certified copy of test results and an MSDS for each LAS lot.

Submit a certificate of compliance for each LAS shipment. With each certificate of compliance, submit:

1. Your signature and printed name
2. Shipment number
3. Material type
4. Material specific gravity
5. Refinery
6. Consignee
7. Destination
8. Quantity
9. Contact or purchase order number
10. Shipment date

Submit proportions for LAS as part of the JMF submittal. If you change the brand or type of LAS, submit a new JMF.

For each job site delivery of LAS, submit one 1/2-pint sample to METS. Submit shipping documents to the Engineer. Label each LAS sampling container with:

1. LAS type
2. Application rate
3. Sample date
4. Contract number

At the end of each day's production shift, submit production data in electronic and printed media. Present data on electronic media in tab delimited format. Use line feed carriage return with 1 separate record per line for each production data set. Allow sufficient fields for the specified data. Include data titles at least once per report. For each mixing operation type, submit in order:

1. Batch mixing:
  - 1.1. Production date
  - 1.2. Time of batch completion
  - 1.3. Mix size and type
  - 1.4. Each ingredient's weight
  - 1.5. Asphalt binder content as a percentage of the dry aggregate weight
  - 1.6. LAS content as a percentage of the asphalt binder weight

2. Continuous mixing:
  - 2.1. Production date
  - 2.2. Data capture time
  - 2.3. Mix size and type
  - 2.4. Flow rate of wet aggregate collected directly from the aggregate weigh belt
  - 2.5. Aggregate moisture content as percentage of the dry aggregate weight
  - 2.6. Flow rate of asphalt binder collected from the asphalt binder meter
  - 2.7. Flow rate of LAS collected from the LAS meter
  - 2.8. Asphalt binder content as percentage of total weight of mix calculated from:
    - 2.8.1. Aggregate weigh belt output
    - 2.8.2. Aggregate moisture input
    - 2.8.3. Asphalt binder meter output
  - 2.9. LAS content as percentage of the asphalt binder weight calculated from:
    - 2.9.1. Asphalt binder meter output
    - 2.9.2. LAS meter output

### **39-1.20A(3) Quality Control and Assurance**

For continuous mixing and batch mixing operations, sample asphalt binder before adding LAS. For continuous mixing operations, sample combined asphalt binder and LAS after the static mixer.

The Engineer orders proportioning operations stopped for any of the following if you:

1. Do not submit data
2. Submit incomplete, untimely, or incorrectly formatted data
3. Do not take corrective actions
4. Take late or unsuccessful corrective actions
5. Do not stop production when proportioning tolerances are exceeded
6. Use malfunctioning or failed proportioning devices

If you stop production, notify the Engineer of any corrective actions taken before resuming.

### **39-1.20B Materials**

LAS-treated asphalt binder must comply with the specifications for asphalt binder in section 39-1.02C. Do not use LAS as a substitute for asphalt binder.

LAS total amine value must be 325 minimum when tested under ASTM D 2074.

Use only 1 LAS type or brand at a time. Do not mix LAS types or brands.

Store and mix LAS under the manufacturer's instruction.

### **39-1.20C Construction**

LAS must be from 0.5 to 1.0 percent by weight of asphalt binder.

If 3 consecutive sets of recorded production data show actual delivered LAS weight is more than  $\pm 1$  percent of the authorized mix design LAS weight, stop production and take corrective action.

If a set of recorded production data shows actual delivered LAS weight is more than  $\pm 2$  percent of the authorized mix design LAS weight, stop production. If the LAS weight exceeds 1.2 percent of the asphalt binder weight, do not use the HMA represented by that data.

The continuous mixing plant controller proportioning the HMA must produce a production data log. The log consists of a series of data sets captured at 10-minute intervals throughout daily production. The data must be a production activity register and not a summation. The material represented by the data is the quantity produced 5 minutes before and 5 minutes after the capture time. For the duration of the Contract, collected data must be stored by the plant controller or a computer's memory at the plant.

### **39-1.20D Payment**

Payment for treating asphalt binder with LAS is included in payment for the HMA involved.

**Replace section 39-1.22 with:**

**39-1.22 LIQUID ASPHALT PRIME COAT**

**39-1.22A General**

The Engineer designates areas receiving liquid asphalt prime coat.

Prime coat must comply with the specifications for liquid asphalt.

**39-1.22B Materials**

Liquid asphalt for prime coat must be Grade SC-70.

**39-1.22C Construction**

Apply at least 0.20 gal of prime coat per square yard of designated area. Do not apply more prime coat than can be absorbed completely by the aggregate base in 24 hours.

If you request and if authorized, you may modify prime coat application rates.

Before paving, prime coat must cure for 48 hours.

Close traffic to areas receiving prime coat. Do not track prime coat onto pavement surfaces beyond the job site.

**39-1.22D Payment**

The Engineer determines prime coat quantities under the specifications for liquid asphalt.

If there is no bid item for liquid asphalt (prime coat), payment is included in the payment for the HMA involved.

**Replace section 39-1.30 with:**

**39-1.30 EDGE TREATMENT, HOT MIX ASPHALT PAVEMENT**

**39-1.30A General**

Section 39-1.30 includes specifications for constructing the edges of HMA pavement as shown.

**39-1.30B Materials**

For the safety edge, use the same type of HMA used for the adjacent lane or shoulder.

**39-1.30C Construction**

The edge of roadway where the safety edge treatment is to be placed must have a solid base, free of debris such as loose material, grass, weeds, or mud. Grade areas to receive the safety edge as required.

The safety edge treatment must be placed monolithic with the adjacent lane or shoulder and shaped and compacted with a device attached to the paver.

The device must be capable of shaping and compacting HMA to the required cross section as shown. Compaction must be by constraining the HMA to reduce the cross sectional area by 10 to 15 percent. The device must produce a uniform surface texture without tearing, shoving, or gouging and must not leave marks such as ridges and indentations. The device must be capable of transition to cross roads, driveways, and obstructions.

For safety edge treatment, the angle of the slope must not deviate by more than  $\pm 5$  degrees from the angle shown. Measure the angle from the plane of the adjacent finished pavement surface.

If paving is done in multiple lifts, the safety edge treatment can be placed either with each lift or with the final lift.

Short sections of hand work are allowed to construct transitions for safety edge treatment.

For more information on the safety edge treatment, go to:

[http://safety.fhwa.dot.gov/roadway\\_dept/pavement/safedge/](http://safety.fhwa.dot.gov/roadway_dept/pavement/safedge/)

You can find a list of commercially available devices at the above Web site under "Frequently Asked Questions" and "Construction Questions."

### **39-1.30D Payment**

Not Used

### **Replace section 39-1.32 with:**

### **39-1.32 HOT MIX ASPHALT WITH WARM MIX ASPHALT TECHNOLOGY**

#### **39-1.32A GENERAL**

##### **39-1.32A(1) Summary**

Section 39-1.32 includes specifications for producing and placing HMA using an approved warm mix asphalt (WMA) technology. Water injection technologies are not allowed. For Department-approved WMA technologies, go to:

[http://www.dot.ca.gov/hq/esc/approved\\_products\\_list/](http://www.dot.ca.gov/hq/esc/approved_products_list/)

HMA Type A-WMA must comply with the specifications for HMA Type A and must be produced and constructed under the Standard construction process.

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 void content is  $7 \pm 1$  percent
2. 4 test specimens
3. 6-inch gyratory compacted test specimen
4. Test temperature is  $122 \pm 2$  degrees F
5. Impression measurements at every 100 passes
6. Inflection point as the number of wheel passes at the intersection of the creep slope and the stripping slope
7. Testing shut off after 25,000 passes
8. For RHMA test specimens:
  - 8.1. Superpave Gyratory Compactor ram pressure may be increased to a maximum 825 kPa
  - 8.2. Specimens may be held at a constant height for a maximum 90 minutes

HMA samples must be prepared under California Test 304, except the samples must be cured in a forced air draft oven at 275 degrees F for 4 hours  $\pm$  10 minutes.

##### **39-1.32A(2) Definitions**

**WMA:** HMA produced at temperatures no greater than 275 degrees F.

**HMA with WMA technology:** HMA produced using additives to aid with mixing and compaction of HMA produced at temperatures greater than 275 degrees F.

##### **39-1.32A(3) Submittals**

###### **39-1.32A(3)(a) General**

With the JMF submittal as specified in section 39-1.03C, submit:

1. Name of WMA technology you propose to use
2. Percent admixture by weight of binder and HMA as recommended by the manufacturer
3. Methodology for inclusion of admixture in laboratory-produced HMA
4. Proposed HMA production temperature range
5. California Test 371 test results for dry strength for untreated plant-produced HMA
6. California Test 371 test results for tensile strength ratio for untreated plant-produced HMA

7. California Test 204 test results for plasticity index if untreated plant-produced HMA test result determined under California Test 371 is below the specified HMA mix design requirements
8. California Test 371 test results for treated plant-produced HMA if untreated plant-produced HMA test result determined under California Test 371 is below the specified HMA mix design requirements
9. AASHTO T 324 (Modified) test results data showing number of passes with rut depth for plant-produced HMA
10. AASHTO T 324 (Modified) test results data showing number of passes at inflection point for plant-produced HMA

The 4th, 5th, and 6th paragraphs of section 39-1.03C do not apply.

**39-1.32A(3)(b) Prepaving Conference**

With the JMF submittal, submit a list of names participating in the prepaving conference. Identify each participant's name, employer, title, and role in the production and placement of HMA with WMA technology.

**39-1.32A(3)(c) Tests and Samples**

At production start-up and within  $\pm 1,000$  tons of the halfway point of the production of HMA with WMA technology, submit samples split from your HMA production sample for California Test 371 and AASHTO T 324 (Modified) test to the Engineer and METS, Attention: Moisture Test.

With the JMF submittal, at JMF verification, at production start-up, and for each 10,000 tons of HMA produced, submit California Test 371 test results and AASHTO T 324 (Modified) test results for mix design and production to the Engineer and electronically to:

Moisture\_Tests@dot.ca.gov

With the JMF submittal, at JMF verification, at production start-up evaluation, and for each 10,000 tons of HMA produced, submit 1 tested sample set from the AASHTO T 324 (Modified) test to the Engineer.

**39-1.32A(3)(d) Daily Production Log**

Submit the log of production data, daily and upon request.

**39-1.32A(4) Quality Control and Assurance**

**39-1.32A(4)(a) General**

Not Used

**39-1.32A(4)(b) Technical Representative**

A technical representative from the WMA technology supplier must be present during the first 3 days of production and placement of HMA using WMA technology. The technical representative must advise you, the Engineer, and the HMA producer. The technical representative must direct the HMA mix operation as it relates to the WMA technology.

The technical representative must advise the HMA producer regarding HMA plant and HMA plant process-controller modifications necessary for integrating WMA technology with HMA plant. HMA plant modifications and WMA technology equipment, scales, and meters must comply with the Department's Materials Plant Quality Program (MPQP).

**39-1.32A(4)(c) Prepaving Conference**

Schedule a prepaving conference with the Engineer at a mutually agreed time and place. Make arrangements for the conference facility. Be prepared to discuss:

1. HMA production and placement
2. Method for incorporating WMA technology and any impacts on HMA production and placement including requirements for compaction and workmanship
3. Contingency plan

The following personnel must attend the prepaving conference:

1. Project Manager
2. Superintendent
3. Technical representative for WMA technology
4. Asphalt binder supplier
5. HMA plant manager
6. HMA plant operators
7. HMA paving foreman

**39-1.32A(4)(d) Quality Control Testing**

Perform sampling and testing at the specified frequency and location for the following additional quality characteristics:

**Minimum Quality Control**

Quality characteristic	Test method	Minimum sampling and testing frequency	Requirement			Sampling location	Maximum reporting time allowance
			HMA Type				
			A-WMA	B-WMA	RHMA-G-WMA		
Moisture susceptibility (minimum dry strength, psi)	California Test 371	First production day and 1 per every 10,000 tons	120	120	120	Loose mix behind the paver. See California Test 125	15 days
Moisture susceptibility (tensile strength ratio, %)	California Test 371		Report Only	Report Only	Report Only		
Hamburg wheel track (minimum number of passes at 0.5 inch average rut depth) PG-58 PG-64 PG-70 PG-76	AASHTO T 324 (Modified)	First production day and 1 per every 10,000 tons	10,000 15,000 20,000 25,000	10,000 15,000 20,000 25,000	15,000 20,000 25,000 --	Loose mix behind the paver. See California Test 125	7 days <sup>a</sup>
Hamburg wheel track (inflection point minimum number of passes) PG-58 PG-64 PG-70 PG-76	AASHTO T 324 (Modified)		10,000 10,000 12,500 15,000	10,000 10,000 12,500 15,000	10,000 12,500 15,000 --		

<sup>a</sup> Submit test data and 1 tested sample set.

**39-1.32A(4)(e) Engineer's Acceptance**

The Engineer samples HMA for acceptance testing and tests for the following additional quality characteristic:

**HMA Acceptance**

Quality characteristic	Test method	Requirement			Sampling location
		HMA Type			
		A-WMA	B-WMA	RHMA-G-WMA	
Moisture susceptibility (minimum dry strength, psi)	California Test 371	120	120	120	Loose mix behind the paver. See California Test 125
Moisture susceptibility (tensile strength ratio, %)	California Test 371	Report Only <sup>a</sup>	Report Only <sup>a</sup>	Report Only <sup>a</sup>	
Hamburg wheel track (minimum number of passes at 0.5 inch average rut depth) PG-58 PG-64 PG-70 PG-76	AASHTO T 324 (Modified)	10,000 15,000 20,000 25,000	10,000 15,000 20,000 25,000	15,000 20,000 25,000 --	Loose mix behind the paver. See California Test 125
Hamburg wheel track (inflection point minimum number of passes) PG-58 PG-64 PG-70 PG-76	AASHTO T 324 (Modified)	10,000 10,000 12,500 15,000	10,000 10,000 12,500 15,000	10,000 12,500 15,000 --	

<sup>a</sup>The Department does not use California Test 371 tensile strength ratio test results from production to determine specification compliance.

**39-1.32B MATERIALS**

**39-1.32B(1) General**

Not Used

**39-1.32B(2) Asphalt Binder**

The grade of asphalt binder to be mixed with aggregate for HMA Type A-WMA must be PG 64-28.

**39-1.32B(3) Aggregate**

The aggregate for HMA Type A-WMA must comply with the 3/4-inch grading.

**39-1.32B(4) Hot Mix Asphalt**

**39-1.32B(4)(a) General**

Not Used

**39-1.32B(4)(b) Mix Design**

Produce HMA mix samples for your mix design using WMA technology. For WMA technology, use your methodology for inclusion of admixture in laboratory-produced HMA.

HMA mix design must comply with the following additional quality characteristics:

### Hot Mix Asphalt Mix Design Requirements

Quality characteristic	Test method	HMA Type		
		A-WMA	B-WMA	RHMA-G-WMA
Moisture susceptibility (minimum dry strength, psi)	California Test 371	120	120	120
Moisture susceptibility (tensile strength ratio, %)	California Test 371	70	70	70
Hamburg wheel track (minimum number of passes at 0.5 inch average rut depth)	AASHTO T 324 (Modified)			
PG-58		10,000	10,000	15,000
PG 64		15,000	15,000	20,000
PG-70		20,000	20,000	25,000
PG-76		25,000	25,000	--
Hamburg wheel track (inflection point minimum number of passes)	AASHTO T 324 (Modified)			
PG-58		10,000	10,000	10,000
PG 64		10,000	10,000	12,500
PG-70		12,500	12,500	15,000
PG-76		15,000	15,000	--

If the determined test results under California Test 371 or AASHTO T 324 (Modified) for untreated plant produced HMA are less than the minimum requirement for the mix design, determine the plasticity index of the aggregate blend under California Test 204. Choose from the antistrip treatments based on plasticity index as shown in the following table:

### Hot Mix Asphalt Antistrip Treatment Options

Quality characteristic	Test method	Treatment requirement
Plasticity index from 4 to 10 <sup>a</sup>	California Test 204	Dry hydrated lime with marination Lime slurry with marination
Plasticity index less than 4		Liquid antistrip Dry hydrated lime without marination Dry hydrated lime with marination Lime slurry with marination

<sup>a</sup> If the plasticity index is greater than 10, do not use that aggregate blend.

Mix design for treated plant-produced HMA must comply with the mix design requirements, except if the tensile strength ratio test result for treated plant produced HMA-A-WMA is less than the mix design requirement for tensile strength ratio, the minimum tensile strength ratio requirement is waived, but you must use any of the following antistrip treatments:

1. HMA aggregate lime treatment – slurry method
2. HMA aggregate lime treatment – dry lime method
3. Liquid antistrip treatment using 0.5 percent liquid antistrip

#### 39-1.32B(4)(c) Job Mix Formula Verification

HMA produced for JMF verification must be produced using the WMA technology shown in the JMF submittal.

Perform the AASHTO T 324 (Modified) test for compliance with the mix design requirements. Submit test data and one tested sample set from the AASHTO T 324 (Modified) test.

The Engineer may verify that the HMA complies with the mix design requirements for AASHTO T 324 (Modified) and California Test 371.

### **39-1.32B(5) Production**

#### **39-1.32B(5)(a) General**

HMA and RHMA produced using WMA technology must be produced at a temperature between 290 and 325 degrees F.

HMA additives used for antistrip treatment and WMA technologies may be either in a liquid or dry state.

The HMA plant must have a sampling device in the feed line connecting the additive storage to the additive metering system. The sampling equipment must comply with California Test 125.

#### **39-1.32B(5)(b) Proportioning Warm Mix Asphalt Technologies**

HMA plants using WMA technology must comply with the Department's MPQP.

Proportion all ingredients by weight. The HMA plant process controller (PPC) must be the sole source of ingredient proportioning control and be fully interfaced with all scales and meters used in the production process. The addition of the HMA additive must be controlled by the PPC.

Weighing and metering devices used for the production of additive enhanced HMA must comply with the requirements of the MPQP. If a loss-in-weight meter is used for dry HMA additive, the meter must:

1. Comply with the requirements of the MPQP
2. Have an automatic and integral material delivery control system for the refill cycle

Calibrate the loss-in-weight meter by:

1. Including at least 1 complete system refill cycle during each calibration test run
2. Operating the device in a normal run mode for 10 minutes immediately before starting the calibration process
3. Isolating the scale system within the loss-in-weight feeder from surrounding vibration
4. Checking the scale system within the loss-in-weight feeder for accuracy before and after the calibration process and daily during mix production
5. Using a 15-minute or 250-pound-minimum test run size for a dry ingredient delivery rate of less than 1 ton per hour
6. Complying with the limits of Table B, "Conveyor Scale Testing Extremes," in the MPQP

Produce additive enhanced HMA by using either a continuous mixing or a batch type HMA plant.

Liquid ingredient additive, including a normally dry ingredient made liquid, must be proportioned with a mass flow meter at continuous mixing plants. Use a mass flow meter or a container scale to proportion liquid additives at batch mixing plants.

Continuous mixing plants using HMA additives must comply with the following:

1. Dry ingredient additives for continuous production must be proportioned with a conveyor scale or a loss-in-weight meter.
2. HMA PPC and ingredient measuring systems must be capable of varying all ingredient feed rates proportionate with the dry aggregate delivery at all production rates and rate changes.
3. Liquid HMA additive must enter the production stream with the binder. Dry HMA additive must enter the production stream at or before the mixing area.
4. If dry HMA additives are used at continuous mixing HMA plants, baghouse dust systems must return all captured material to the mix.
5. HMA additive must be proportioned to within  $\pm 0.3$  percent of the target additive rate.

Batch mixing plants using HMA additives must comply with the following:

1. Metered HMA additive must be placed in an intermediate holding vessel before being added to the stream of asphalt binder as it enters the pugmill.
2. If a container scale is used, weigh additive before combining with asphalt binder. Keep the container scale separate from other ingredient proportioning. The container scale capacity must be no more

than twice the volume of the maximum additive batch size. The container scale's graduations must be smaller than the proportioning tolerance or 0.001 times the container scale capacity.

3. Dry HMA additive proportioning devices must be separate from metering devices for the aggregates and asphalt binder. Proportion dry HMA additive directly into the pugmill or place in an intermediate holding vessel to be added to the pugmill at the appropriate time in the batch cycle. Dry ingredients for batch production must be proportioned with a hopper scale.
4. Zero tolerance for the HMA additive batch scale is  $\pm 0.5$  percent of the target additive weight. The indicated HMA additive batch scale weight may vary from the preselected weight setting by up to  $\pm 1.0$  percent of the target additive weight.

### **39-1.32B(5)(c) Production Data Collection**

The HMA PPC must produce an electronic log of production data consisting of a series of snapshots captured at a maximum of 1-minute intervals throughout daily production. Each snapshot of production data must be a register of production activity at that time and not a summation of the data over the preceding interval to the previous snapshot. The amount of material represented by each snapshot is the amount produced during the 0.5-minute interval before and the 0.5-minute interval after the capture time. Collect and hold data for the duration of the contract and submit the electronic media, daily and upon request. The snapshot of production data must include the following:

1. Date of production
2. Production location
3. Time of day the data is captured
4. HMA mix type being produced and target binder rate
5. HMA additive type, brand, and target rate
6. Temperature of the binder and HMA mixture
7. For a continuous mix operation, the rate of flow of the dry aggregate calculated from the wet aggregate flow rate as determined by the conveyor scale
8. For a continuous mix plant operation, the rate of flow of the asphalt meter
9. For a continuous mix plant operation, the rate of flow of HMA additive meter
10. For a batch plant operation, actual batch weights of all ingredients
11. Dry aggregate to binder ratio calculated from metered ingredient output
12. Dry aggregate to HMA additive ratio calculated from metered output

Electronic media must be presented in a comma-separated values (CSV) or tab-separated values (TSV) format. Captured data, for the ingredients represented by production snapshot, must have allowances for sufficient fields to satisfy the amount of data required by these specifications and include data titles at least once per report.

### **39-1.32C CONSTRUCTION**

#### **39-1.32C(1) General**

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 unless authorized.

Produce HMA and RHMA at a temperature between 290 and 325 degrees F.

#### **39-1.32C(2) Spreading and Compacting**

Do not allow traffic on new HMA pavement until its mid-depth temperature is below 130 degrees F. The 17th paragraph of section 39-1.11 does not apply.

The 3rd, 4th, 5th, 6th, and 10th paragraphs of section 39-3.04 do not apply. If the atmospheric temperature is below 60 degrees F, cover loads in trucks with tarpaulins. If the time for HMA discharge to truck at the HMA plant until transfer to paver's hopper is 90 minutes or greater and if the atmospheric temperature is below 70 degrees F, cover loads in trucks with tarpaulins. The tarpaulins must completely cover the exposed load until you transfer the mixture to the paver's hopper or to the pavement surface. Tarpaulins are not required if the time from discharging to the truck until transfer to the paver's hopper or the pavement surface is less than 30 minutes.

For method process, spread HMA Type A-WMA and Type B-WMA when the atmospheric and surface temperatures are above the minimum temperatures shown in the following table:

### Minimum Atmospheric and Surface Temperatures

Compacted layer thickness	Atmosphere, °F		Surface, °F	
	Unmodified asphalt binder	Modified asphalt binder	Unmodified asphalt binder	Modified asphalt binder <sup>a</sup>
< 0.15	45	40	50	45
0.15-0.25	40	40	40	40

<sup>a</sup> Except asphalt rubber binder.

If the asphalt binder for HMA Type A-WMA and Type B-WMA is unmodified asphalt binder, complete:

1. First coverage of breakdown compaction before the surface temperature drops below 240 degrees F
2. Breakdown and intermediate compaction before the surface temperature drops below 190 degrees F
3. Finish compaction before the surface temperature drops below 140 degrees F

If the asphalt binder for HMA Type A-WMA and Type B-WMA is modified asphalt binder, complete:

1. First coverage of breakdown compaction before the surface temperature drops below 230 degrees F
2. Breakdown and intermediate compaction before the surface temperature drops below 170 degrees F
3. Finish compaction before the surface temperature drops below 130 degrees F

For RHMA-G-WMA:

1. Only spread and compact if the atmospheric temperature is at least 50 degrees F and the surface temperature is at least 50 degrees F
2. Complete the 1st coverage of breakdown compaction before the surface temperature drops below 260 degrees F
3. Complete breakdown and intermediate compaction before the surface temperature drops below 230 degrees F
4. Complete finish compaction before the surface temperature drops below 180 degrees F

#### **39-1.32C(3) Material Transfer Vehicle**

A material transfer vehicle (MTV) must be used when placing HMA with WMA technologies.

The MTV must:

1. Either receive HMA directly from trucks or use a windrow pickup head to load it from a windrow deposited on the roadway surface
2. Transfer HMA directly into the paver's receiving hopper or feed system
3. Remix the HMA with augers before loading the paver
4. Have sufficient capacity to prevent stopping the paver

HMA deposited in a windrow on the roadway surface must not extend more than 100 feet in front of the MTV.

#### **39-1.32D PAYMENT**

Not Used

#### **Add to section 39-6.01:**

The bid item for place hot mix asphalt (miscellaneous area) is limited to the areas shown and is in addition to the bid items for the materials involved.

AA

## DIVISION VI STRUCTURES

### 51 CONCRETE STRUCTURES

**Replace "Reserved" in section 51-7.02 with:**

**51-7.02A General**

**51-7.02A(1) Summary**

Section 51-7.02 includes specifications for constructing PC drainage inlets.

**51-7.02A(2) Definitions**

Reserved

**51-7.02A(3) Submittals**

For inlets with oval or circular cross sections, submit shop drawings with calculations. Shop drawings and calculations must be sealed and signed by an engineer who is registered as a civil engineer in the State. Allow 15 days for the Engineer's review.

Submit field repair procedures and a patching material test sample before repairs are made. Allow 10 days for the Engineer's review.

**51-7.02A(4) Quality Control and Assurance**

The Engineer may reject PC drainage inlets exhibiting any of the following:

1. Cracks passing through walls more than 1/16 inch wide
2. Nonrepairable honeycombed or spalled areas of more than 6 square inches
3. Noncompliance with reinforcement tolerances or cross sectional area shown
4. Wall or lid less than minimum thickness
5. Internal dimensions less than plan dimensions by 1 percent or 1/2 inch, whichever is greater
6. Defects affecting performance or structural integrity

**51-7.02B Materials**

**51-7.02B(1) General**

Nonshrink grout must be a dry, packaged type complying with ASTM C 1107.

Concrete for basin or inlet floors placed in the field must comply with the specifications for minor concrete.

Joint sealant must be butyl-rubber complying with ASTM C 990. Joint primer must be recommended by the joint seal manufacturer.

Resilient connectors must comply with ASTM C 923.

Sand bedding must comply with section 19-3.02E.

Bonding agents must comply with ASTM C 1059, Type II.

**51-7.02B(1) Fabrication**

If oval or circular shape cross-sections are furnished, they must comply with *AASHTO LRFD Bridge Design Specifications, Fourth Edition with California Amendments*.

Wall and slab thicknesses may be less than the dimensions shown by at most 5 percent or 3/16 inch, whichever is greater.

Reinforcement placement must not vary more than 1/2 inch from the positions shown.

Cure PC drainage inlets under section 90-4.03.

**51-7.02C Construction**

Repair PC drainage inlet sections to correct damage from handling or manufacturing imperfections before installation.

Center pipes in openings to provide a uniform gap. Seal gaps between the pipe and the inlet opening with nonshrink grout under the grout manufacturer's instructions. For systems designated as watertight, seal these gaps with resilient connectors.

Match fit keyed joints to ensure uniform alignment of walls and lids. Keys are not required at the inlet floor level if the floor is precast integrally with the inlet wall. Seal keyed joint locations with preformed butyl rubber joint sealant. You may seal the upper lid and wall joint with grout.

Clean keyed joint surfaces before installing sealant. Joint surfaces must be free of imperfections that may affect the joint. Use a primer if surface moisture is present. Use a sealant size recommended by the sealant manufacturer. Set joints using sealant to create a uniform bearing surface.

Flat drainage inlet floors must have a field-cast topping layer at least 2 inches thick with a slope of 4:1 (horizontal:vertical) toward the outlet. Use a bonding agent when placing the topping layer. Apply the bonding agent under the manufacturer's instructions.

**51-7.02D Payment**

Not Used

**51-7.02D Payment**

AA

**56 SIGNS**

**Add to section 56-2.01B(5):**

Exposed aluminum surfaces on sign panels must be painted. The 2nd finish coat color must match color no. 30059 of FED-STD-595B.

**Add to section 56-2.01C:**

Clean and prepare aluminum surfaces under SSPC SP-1. One coat of primer must be applied by spraying to produce a uniform wet film on the surface.

**Add to section 56-2.01D:**

Payment for cleaning and painting the exposed surfaces of sign panels is included in the payment for the types of furnish single sheet aluminum sign work involved.

**Add to section 56-4.02B:**

Metal posts for roadside signs must comply with the details shown and must comply with section 75 except for payment.

## 59 PAINTING

### Add to section 59-7.01:

Complete a test panel under section 51-1.01D(3) before starting staining activities. For independent testing, the Contractor must supply the State, within 30 days of beginning project work, with five gallons of oxide coloration agent to become the property of the State.

### Add to section 59-7.03:

The final color of the stained concrete must produce a brownish earth tone color that will match concrete with existing treated concrete approved by Tahoe Regional Planning Agency (TRPA) along Highway 28 (N Lake Boulevard) upside slope between Placer post mile 3.548 and 4.102 near Dollar Hill and Old County Road.

The color of the sealing compound must match the stain as closely as possible.

### Add to section 59:

## 59-11 STAINING GALVANIZED STEEL SURFACES

### 59-11.01 GENERAL

#### 59-11.01A Summary

Section 59-11 includes specifications for cleaning and staining all visible surfaces of galvanized metal beam guard railing, galvanized metal posts for signs, delineators, object markers, highway post markers and appurtenances to achieve a dark brown finish.

#### 59-11.01B Submittals

Submit the following 7 days prior to staining:

1. Copy of the stain manufacturer's product Material Safety Data Sheet, written stain application instructions, and the location and date of staining test section
2. Certificate of compliance for the stain
3. Proposed methods to control overspray, spillage, and protection of adjacent surfaces for staining work occurring at the job site.

#### 59-11.01C Quality Control and Assurance

##### 59-11.01C(1) Referee Sample

Stained surfaces must closely resemble the color of the referee sample located at Meyers Maintenance Station available for inspection at 2243 Cornelian Drive, South Lake Tahoe, CA 96150.

##### 59-11.01C(2) Test Section

Apply stain to a minimum 2 foot test section of MBGR or other galvanized steel surfaces of the same specified size. Notify the Engineer not less than 7 days before staining the test section.

Prepare and stain the test section with materials, tools, equipment and methods you will use in the work.

Allow applied stain to cure for a minimum of 5 days before the Engineer's inspection. If more than one test section is required by the Engineer, each additional test section is change order work.

The Engineer uses test sections as the standard of comparison for accepting staining.

### 59-11.02 MATERIALS

Stain must consist of a clear soluble solution of soft buffered organic acids that accelerates the oxidization process without compromising the protective qualities of the galvanized surfacing. No pigment based colorants should be added to achieve the desired color. The stain must react with the galvanized



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**DIVISION VIII MISCELLANEOUS CONSTRUCTION**  
**72 SLOPE PROTECTION**

**Replace section 72-2.02B with:**

**72-2.02B Fabric**

Fabric must comply with the specifications for geosynthetics, section 88, and the following.

When tested under the referenced ASTMs, the properties of filter fabric must have the values shown in the following table:

<b>Filter Fabric</b>		
Property	ASTM	Specification
Grab breaking load, lb 1-inch grip, minimum in each direction	D 4632	120
Apparent elongation, percent minimum, in each direction	D 4632	50
Permittivity, sec <sup>-1</sup> , minimum and maximum	D 4491	1.6-1.8
Apparent opening size, U.S. Standard sieve size minimum and maximum	D 4751	60-80
Ultraviolet resistance, percent minimum retained grab breaking load, 500 hr.	D4355	70

**Replace the 3rd sentence of the 2nd paragraph of section 72-16.02C with:**

If the gabions are exposed to natural sunlight, the color of the PVC coating must be brown and resistant to fading.

AA

**80 FENCES**

**Replace Section 80-4 with:**

**80-4 SPLIT RAIL FENCE**

**80-4.01 GENERAL**

**80-4.01A Summary**

Section 80-4 includes specifications for constructing split rail fence.

**80-4.02 MATERIALS**

**80-4.02A General**

Fence posts and rails must be constructed of untreated cedar, split surface, comply with section 57.



For Type ET terminal system, the steel foundation tubes with soil plates attached must be, at the Contractor's option, either driven, with or without pilot holes, or placed in drilled holes. Space around the steel foundation tubes must be backfilled with selected earth, free of rock, placed in layers approximately 4 inches thick and each layer must be moistened and thoroughly compacted. The wood terminal posts must be inserted into the steel foundation tubes by hand and must not be driven. Before the wood terminal posts are inserted, the inside surfaces of the steel foundation tubes to receive the wood posts must be coated with a grease that will not melt or run at a temperature of 149 degrees F or less. The edges of the wood terminal posts may be slightly rounded to facilitate insertion of the post into the steel foundation tubes.

For Type SKT terminal system, the soil tubes must be, at the Contractor's option, driven with or without pilot holes, or placed in drilled holes. Space around the steel foundation tubes must be backfilled with selected earth, free of rock, placed in layers approximately 4 inches thick and each layer must be moistened and thoroughly compacted. Wood posts must be inserted into the steel foundation tubes by hand. Before the wood terminal posts are inserted, the inside surfaces of the steel foundation tubes to receive the wood posts must be coated with a grease that will not melt or run at a temperature of 149 degrees F or less. The edges of the wood posts may be slightly rounded to facilitate insertion of the post into the steel foundation tubes.

After installing the terminal system, dispose of surplus excavated material in a uniform manner along the adjacent roadway where designated by the Engineer.

**Replace section 83-1.02C(3) with:**

**83-1.02C(3) Alternative Flared Terminal System**

Alternative flared terminal system must be furnished and installed as shown on the plans and under these special provisions.

The allowable alternatives for a flared terminal system must consist of one of the following or a Department-authorized equal.

1. TYPE FLEAT TERMINAL SYSTEM - Type FLEAT terminal system must be a Flared Energy Absorbing Terminal 350 manufactured by Road Systems, Inc., located in Big Spring, Texas, and must include items detailed for Type FLEAT terminal system shown on the plans. The Flared Energy Absorbing Terminal 350 can be obtained from the distributor, Universal Industrial Sales, P.O. Box 699, Pleasant Grove, UT 84062, telephone (801) 785-0505 or from the distributor, Gregory Industries, Inc., 4100 13<sup>th</sup> Street, S.W., Canton, OH 44708, telephone (330) 477-4800.
2. TYPE SRT TERMINAL SYSTEM - Type SRT terminal system must be an SRT-350 Slotted Rail Terminal (8-post system) as manufactured by Trinity Highway Products, LLC, and must include items detailed for Type SRT terminal system shown on the plans. The SRT-350 Slotted Rail Terminal (8-post system) can be obtained from the manufacturer, Trinity Highway Products, LLC, P.O. Box 99, Centerville, UT 84012, telephone (800) 772-7976.

Submit a certificate of compliance for terminal systems.

Terminal systems must be installed under the manufacturer's installation instructions and these specifications. Each terminal system installed must be identified by painting the type of terminal system in neat black letters and figures 2 inches high on the backside of the rail element between system posts numbers 4 and 5.

For Type SRT terminal system, the steel foundation tubes with soil plates attached must be, at the Contractor's option, either driven, with or without pilot holes, or placed in drilled holes. Space around the steel foundation tubes must be backfilled with selected earth, free of rock, placed in layers approximately 4 inches thick and each layer must be moistened and thoroughly compacted. The wood terminal posts must be inserted into the steel foundation tubes by hand and must not be driven. Before the wood terminal posts are inserted, the inside surfaces of the steel foundation tubes to receive the wood posts must be coated with a grease that will not melt or run at a temperature of 149 degrees F or less. The edges of the wood terminal posts may be slightly rounded to facilitate insertion of the post into the steel foundation tubes.



**84-4.01B Submittals**

Submit a certificate of compliance for the two-component paint and glass beads. The certificate must specify the name, batch number, and product manufacturing date.

**84-4.01C Quality Control and Assurance**

Before starting permanent application of two-component paint, apply a test stripe of the two-component paint on roofing felt or other suitable material in the presence of the Engineer. The test section must be at least 50 feet in length.

**84-4.02 MATERIALS**

Fast curing epoxy traffic paint for two-component paint must be listed on the Authorized Material List.

Large gradation glass beads must be listed on the Authorized Material List.

Small gradation glass beads must comply with AASHTO M247, Type 1.

Coat both gradations of glass beads with an adhesion-promoting and water-repellant coating as recommended by the paint manufacturer.

You may use alternative types of glass beads recommended by the paint manufacturer if authorized.

**84-4.03 CONSTRUCTION**

Do not apply two-component traffic paint for stripes and pavement markings until authorized.

Apply the two-component paint for traffic stripes and pavement markings only to clean, completely dry surfaces when the pavement surface temperature is above 39 degrees F and the atmospheric temperature is above 36 degrees F.

During application of two-component paint, the temperature of the two-component paint must comply with the paint manufacturer's instructions.

Apply two-component paint for traffic stripes and pavement markings at a minimum thickness of  $0.020 \pm 0.002$  inch and at a minimum application rate of 80 sqft/gal.

During the application of two-component paint and glass beads, the striping machine must not travel faster than 10 mph.

Apply two-component paint and glass beads in 1 pass. First apply two-component paint; followed by the large gradation glass beads; followed by the small gradation glass beads. Apply the glass beads with 2 separate applicator guns.

Distribute the glass beads uniformly on traffic stripes and pavement markings.

You may apply the glass beads by hand methods on pavement markings.

Apply the large gradation glass beads at a minimum rate of 11.7 pounds per gallon of two-component paint.

Apply the small gradation glass beads at a minimum rate of 8.3 pounds per gallon of two-component paint.

The daytime and nighttime color of two-component paint for traffic stripes and pavement markings with glass beads must comply with ASTM D 6628.

**84-4.04 PAYMENT**

Not Used



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 section 86-2.04A:**

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

**Add to section 86-2.04B(1):**

Powder coat galvanized standard surfaces.

Before applying the powder coating, clean and prepare all exposed metal surfaces under the powder coating manufacturer's instructions.

All cleaned surfaces must receive a single powder coating consisting of dry powder electrostatically applied to the surface and baked to form a smooth uniform durable surface. Submit a certificate of compliance for each shipment of powder coated material.

The powder coating will meet the weathering performance requirements of the American Architecture Manufacturers Association (AAMA) 621. In addition the coating must meet the following performance criteria:

Requirement	ASTM Designation	Specification limits
Adhesion to Galvanized Surface	D 3359B	Minimum - 4B
Pencil Hardness	D 3363	HB minimum
Flexibility	D 522	Pass – 1/8" Mandrel
Impact Resistance	D 2794	Pass – 80 lbf-in
Color Stability	G 155, Table X3.1, Cycle 1	2200 hours, C.I.E. L*a*b System Color Tolerance: DE*ab<5. No change in 60 degree gloss value.
Salt Spray Resistance	B 117 and D1654	1500 hours - Rating of 8 or greater

Submit three 8 by 8 inch samples of the finish color and a copy of the test results with 30 days of sample fabrication. The samples will be used to verify compliance with the powder coating requirements listed above.

The color of the powder coating must be green complying with color no. 34108 of FED-STD-595. The total dry film thickness of the powder coating must not be less than 3 mils.

**Add to section 86-2.05A:**

Conduit installed underground must be Type 3.

**Add to section 86-2.05B:**

The conduit in a foundation and between a foundation and the nearest pull box must be Type 3.

**Add to section 86-2.05C:**

After conductors have been installed, the ends of the all conduits must be sealed with an authorized type of sealing compound.

**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**

This work includes 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, "Specifications 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 11325 Sanders Drive Rancho Cordova, California 95742.

**86-2.06B(2) Materials**

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

Each pull box 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.

### **Add to section 86-2.08A:**

Wrap conductors around the projecting end of conduit in pull boxes as shown. Secure conductors and cables to the projecting end of the conduit in pull boxes.

### **Add to section 86-2.08:**

#### **86-2.08F CATEGORY 5E CABLE**

##### **86-2.08F(1) General**

##### **86-2.08F(1)(a) Summary**

Category 5E cable must be the unshielded, outdoor rated, non-gel filled type, and must meet the requirements of TIA/EIA 568B.

##### **86-2.08F(1)(b) Submittals**

The Contractor to provide cut sheets and documentation showing the cable is a manufacturer certified Category 5E cable.

##### **86-2.08F(1)(c) Quality Control and Assurance**

Category 5E Certified installations are required for installed lengths of less than 328 feet of finished cable. The installation of the Cat 5E cable must be a certified installation.

**86-2.08F(2) Materials**

Category 5E cable must meet the following:

1. The cable must contain 8 conductors, each of which must be No. 24, minimum, solid bare copper conductors. Each conductor must be insulated with polyolefin, polyethylene, polyvinyl chloride or fluorinated ethylene propylene material.
2. The cable jacket must be rated for a minimum of 300 V and 140 °F and must be polyvinyl chloride, polyethylene, polyolefin or fluorinated ethylene propylene. The jacket must be black, gray, or blue. The jacket must be marked as required by NEMA. The jacket must be marked at intervals of not more than 3 feet with the cable identification: manufacturer's name, product identification, number of conductors and conductor size, and voltage and temperature ratings. Cable length markings may be sequentially alternated with the cable identification markings at not more than every other interval.
3. The finished outside diameter of the cable must not exceed 1/2-inch.

**86-2.08F(3) Construction**

The cable run between components must be continuous without splices. A minimum of 3 feet of slack must be provided at the pull box near the new 332 traffic signal cabinet.

The ends of category 5E cable must be terminated with 8P8C modular connectors.

**86-2.08F(4) Payment**

Not Used

**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:**

Continuous welding of exterior seams in service equipment enclosures is not required.

Circuit breakers must be the cable-in/cable-out type mounted on non-energized clips. All circuit breakers must be mounted vertically with the up position of the handle being the "ON" position.

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 7th and 8th paragraphs of section 86-2.11A with:**

The external cabinet surfaces must be powder coated aluminum sheet with a coating that is at least 2 mils thick. The color must be green, Federal Standard 595B No. 34108.

The powder coating must meet the performance requirements of the American Architecture Manufacturers Association (AAMA) 2604, "Performance Requirements and Test Procedure for High Performing Organic Coatings on Aluminum Extrusion and Panels." In addition the coating must meet the following performance criteria:

Requirement	ASTM Designation	Specification
Adhesion	D 3359, Method B	Rating of 5B
Pencil Hardness	D 3363	Gauge Hardness - H minimum
Artificial Weathering	G 154, Cycle 2 in Table X2.1	No change in coating appearance within 300 hours of exposure.

Furnish three samples, 8" by 8" with finish color to the Engineer at the Contractor's expense. The samples must be representative of the cabinets to be delivered and tested at the Contractor's expense. Furnish a copy of the test results to the Engineer within 30 days following the sample fabrication. Allow adequate time for the Engineer to review the samples. Correct any deficiencies found without delay in completion of work. The samples will be used to verify compliance of the powder coating requirements listed herein.

If the tests on the samples fail to comply with these specifications, the powder coating material will be rejected.

The Contractor must arrange with the service utility to complete service connections for temporary service installations. The Contractor must pay all costs and fees for the energy, line extension, and service connections required by the service utility. Inform the Engineer 15 days before the service connections are required.

**Replace 1st paragraph of section 86-2.18 with:**

Place numbers on the equipment as ordered.

**Delete 2nd sentence of 3rd paragraph of section 86-2.18:**

**Add to section 86-3.01B:**

**86-3.01B(1) Powder Coating Department-furnished Cabinet**

Powder coat the cabinet after receiving it at the job site.

You must pay for all shipping, handling, and transportation costs related to the powder coating and the acceptance testing at the Transportation Laboratory.

All components must be removed before the powder coating is applied:

1. Cage support with all the components in one piece after disconnecting electrical connectors.
2. All electronic components such as fan, police panel and door interlock switches, wiring, and etc.
3. All mechanical components such as door and police panel locking mechanism, all latching mechanism, filter assembly, gaskets, and etc.

Document the location of all components, and store the removed components in dry and temperature controlled location.

The external cabinet surfaces must be powder coated with a coating that is at least 2 mils thick. The color must be green, Federal Standard 595B No. 34108.

The powder coating must meet the performance requirements of the American Architecture Manufacturers Association (AAMA) 2604, "Performance Requirements and Test Procedure for High Performing Organic Coatings on Aluminum Extrusion and Panels." In addition the coating must meet the following performance criteria:

Requirement	ASTM Designation	Specification
Adhesion	D 3359, Method B	Rating of 5B
Pencil Hardness	D 3363	Gauge Hardness - H minimum
Artificial Weathering	G 154, Cycle 2 in Table X2.1	No change in coating appearance within 300 hours of exposure.

Furnish three samples, 8" by 8" with finish color to the Engineer at the Contractor's expense. The samples must be representative of the cabinets to be delivered and tested at the Contractor's expense. Furnish a copy of the test results to the Engineer within 30 days following the sample fabrication. Allow adequate time for the Engineer to review the samples. Correct any deficiencies found without delay in completion of work. The samples will be used to verify compliance of the powder coating requirements listed herein.

If the tests on the samples fail to comply with these specifications, the powder coating material will be rejected.

Reassembled the powder coated cabinet with the removed components. Install new gaskets. The Engineer will inspect the reassembled powder coated cabinet with the documentation for the component verification before the installation.

Before shipping the powder coated cabinet to job site, submit each cabinet to the Transportation Laboratory at 5900 Folsom Blvd. Sacramento, CA 95819 for the acceptance testing.

**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 11325 Sanders Drive Rancho Cordova, California 95742.

**Add to section 86-3.02B:**

External cabinet must be capable of housing:

1. 8 batteries
2. Inverter/charger unit
3. Power transfer relay
4. Manually-operated bypass switch
5. Required control panels
6. Wiring and harnesses

**Delete the 3rd paragraph of section 86-3.02B:**

**Replace the 6th paragraph of section 86-3.02B with:**

The external cabinet surfaces must be powder coated aluminum sheet with a coating that is at least 2 mils thick. The color must be green, Federal Standard 595B No. 34108.

The powder coating must meet the performance requirements of the American Architecture Manufacturers Association (AAMA) 2604, "Performance Requirements and Test Procedure for High Performing Organic Coatings on Aluminum Extrusion and Panels." In addition the coating must meet the following performance criteria:

Requirement	ASTM Designation	Specification
Adhesion	D 3359, Method B	Rating of 5B
Pencil Hardness	D 3363	Gauge Hardness - H minimum
Artificial Weathering	G 154, Cycle 2 in Table X2.1	No change in coating appearance within 300 hours of exposure.

Furnish three samples, 8" by 8" with finish color to the Engineer at the Contractor's expense. The samples must be representative of the cabinets to be delivered and tested at the Contractor's expense. Furnish a copy of the test results to the Engineer within 30 days following the sample fabrication. Allow adequate time for the Engineer to review the samples. Correct any deficiencies found without delay in completion of work. The samples will be used to verify compliance of the powder coating requirements listed herein.

If the tests on the samples fail to comply with these specifications, the powder coating material will be rejected.

#### **Add to section 86-3:**

### **86-3.05 8 PORT ETHERNET SWITCH**

#### **86-3.05A General**

##### **86-3.05A(1) Summary1**

The Ethernet switch must be a hardened switch used to expand the amount of Ethernet ports available at the network field hub. The Ethernet switch shall have a minimum capacity of eight (8) network connections. The Ethernet switch shall be installed on a DIN rail in the cabinet.

##### **86-3.05A(2) Definitions**

HUB - Network focal point

DIN - Top Hat Type 35mm

RTMC - Regional Transportation Management Center

##### **86-3.05A(3) Submittals**

Before furnishing Ethernet switch to the job site, submit equipment document. Include:

1. Contract number
2. Manufacturer's name
3. Manufacturer's installation instructions
4. Your contact information
5. Manufacturer specification sheet along with the complete ordering number of the equipment.

Send an additional copy for approval to the RTMC Office of Electrical Systems at 3165 Gold Valley Drive, Rancho Cordova, CA 95742.

##### **86-3.05A(4) Quality Control and Assurance**

###### **86-3.05A(4)(a) Warranty**

Furnish a 3-year replacement warranty from the manufacturer of the Ethernet switch against any defects or failures. The effective date of the warranty is the date of acceptance of the installation. Replacement switch must be provided within 10 days of receipt of a failed unit at no cost to the State, except the cost of shipping failed unit. Deliver replacement switch to: RTMC at 3165 Gold Valley Drive, Rancho Cordova, California 95742.

##### **86-3.05B Materials**

The Ethernet switch must meet or exceed the following requirements:

1. Ethernet Interface: 10/100Base T, IEEE 802.3, Auto-Negotiate, Auto-MDI-MDIX
2. Ports: (8) RJ-45, STP and UTP
3. LED Indicators: Power, Per Port Link Speed Status
4. Memory: 768 Kbits packet buffer
5. Input Voltage: 12 - 48 V(dc)
6. DIN Mount: Top Hat 35 mm
7. Operating Temperature: -40 °F to +167 °F
8. Warranty: Three year minimum

### **86-3.05C Construction**

Deliver the equipment to the Engineer for configuration and testing. Equipment will be returned to you for installation. After installation, the Department will test the equipment as part of the local area field network system.

### **86-3.05D Payment**

Not Used

### **Add to section 86-3:**

### **86-3.06 Ethernet Security Router**

#### **86-3.06A General**

##### **86-3.06A(1) Summary**

The Ethernet Security Router (router) is to create a secure internet connection to the Caltrans existing WAN. The router shall back-haul the local ITS element data to the RTMC for processing.

##### **86-3.06A(2) Definitions**

WAN – Wide Area Network

ITS – Intelligent Transportation System

VPN – Virtual Private Network

RTMC – Regional Transportation Management Center

##### **86-3.06A(3) Submittals**

Before furnishing router to the job site, submit equipment document. Include:

1. Contract number
2. Manufacturer's name
3. Manufacturer's installation instructions
4. Your contact information
5. Manufacturer specification sheet along with the complete ordering number of the equipment.

Send an additional copy for approval to the RTMC Office of Electrical Systems at 3165 Gold Valley Drive, Rancho Cordova, CA 95742.

##### **86-3.06A(4) Quality Control and Assurance**

Must be compatible with the existing Caltrans Cisco VPN Aggregation Router (ASR 1001).

##### **86-3.06A(4)(a) Warranty**

Furnish a 1-year replacement warranty from the manufacturer of the router against any defects or failures. The effective date of the warranty is the date of acceptance of the installation. Replacement router must be provided within 10 days of receipt of a failed unit at no cost to the State, except the cost of shipping failed unit. Deliver replacement router to: RTMC at 3165 Gold Valley Drive, Rancho Cordova, California 95742.

##### **86-3.06B Materials**

The router shall meet or exceed the following requirements:

1. LAN interfaces: 4-port 10/100 Mbps
2. WAN Interface: 1-port 10/100 Mbps
3. Security Feature: Dynamic Multipoint VPN (DMVPN) (multipoint GRE Tunnel Interface and Next Hop Resolution Protocol (NHRP)
4. Dynamic Memory: 256Mb DRAM
5. Flash Memory: 128Mb Flash)
6. LAN Switch: Managed 4-port 10/100Base-T, Auto-Negotiate, Auto MDI/MDIX
7. Console Port: RJ-45
8. Power Supply: Universal 100 to 240 V(ac)
9. LED Indicators: PWR, WAN (Rx, Tx), PPP, VPN, LAN (0-3)
10. 1-year manufacturers warranty

### **86-3.06C Construction**

Deliver the equipment to the Engineer for configuration and testing. Equipment will be returned to you for installation. After installation, the Department will test the equipment as part of the local area field network system.

### **86-3.06D Payment**

Not Used

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

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

The manufacturer must provide a 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 State Maintenance Electrical Shop at 11325 Sanders Drive Rancho Cordova, California 95742.

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

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

#### **Replace section 86-4.03 with:**

### **86-4.03 LED COUNTDOWN PEDESTRIAN SIGNAL FACE MODULES**

#### **86-4.03A General**

##### **86-4.03A(1) Summary**

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

##### **86-4.03A(2) Submittals**

Before shipping to the job site, submit the LED countdown PSF module and the following to METS:

1. Delivery form including district number, EA, and contact information
2. List containing serial numbers of all LED countdown PSF module anticipated for use
3. Installation manuals and schematic wiring diagram
4. Manufacturer's name, trademark, model number, lot number, and month and year of manufacture

Submit documentation of the manufacturer's production quality assurance testing performed on LED countdown PSF module and include test data showing compliance with the specified requirements. Test data must also 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.

##### **86-4.03A(3) Quality Control and Assurance**

###### **86-4.03A(3)(a) General**

Module must be on the Authorized Material List.

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

The Department tests LED countdown PSF modules under ANSI/ASQ Z1.4 and California Test 606. Comply with section 86-2.14A. The module submitted for testing must be representative of typical production units. All parameters of the specifications may be tested on the module.

#### **86-4.03A(3)(b) Warranty**

Provide a 5 years manufacturer replacement warranty for the LED countdown PSF module against defects in materials and workmanship. Warranty is effective from the date of successful completion of acceptance testing. Submit all warranty documentation before installation.

Provide replacement parts within 15 days after receipt of the failed parts. Deliver the replacement parts to the following Department Maintenance Electrical Shop:

State Maintenance Electrical Shop at 11325 Sanders Drive, Rancho Cordova, California 95742.

#### **86-4.03B Materials**

##### **86-4.03B(1) General**

LED countdown PSF module must:

1. Be from the same manufacturer.
2. Be installed in a standard Type A pedestrian signal housing.
3. Use LED as the light source.
4. 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*.
5. Have a minimum power consumption of 10 W for the "upraised hand."
6. Use 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.
7. Be able to replace signal lamp optical units and PSF.
8. Fit into pedestrian signal section housings without modifications.
9. Be a single, self-contained device, not requiring on-site assembly for installation.
10. Have the following information permanently marked on the back of module:
  - 10.1. Manufacturer's name
  - 10.2. Trademark
  - 10.3. Model number
  - 10.4. Serial number
  - 10.5. Lot number
  - 10.6. Month and year of manufacture
  - 10.7. Required operating characteristics, including:
    - 10.7.1. Rated voltage
    - 10.7.2. Power consumption
    - 10.7.3. Volt-ampere (VA)
    - 10.7.4. Power factor
11. 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.

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

Individual LEDs must be wired so catastrophic loss or failure of 1 LED will not result in loss of more than 5 percent of the PSF module light output. Failure of an individual LED in a string must not result in the loss of entire string or the indication.

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

No special tools for installation are allowed.

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

Assembly and manufacturing processes for LED countdown PSF module must assure that all internal components are adequately supported to withstand mechanical shock and vibration from high winds and other sources.

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

Enclosures containing the power supply or electronic components of LED countdown PSF module, except lenses, 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 highest and lowest luminance values. Symbols must comply with ITE publication, Equipment and Material Standards, chapter 3, "Pedestrian Traffic Control Signal Indications," and the *California MUTCD*.

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 from 10 feet to the full width of the area to be crossed.

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:

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 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 LED countdown PSF module must comply with the following chromaticity requirements for 60 months:

"Upraised hand" and 2-digit countdown timer (portland orange)	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

LED countdown PSF module maximum power consumption must not exceed the values shown in the following table:

PSF module	Power consumption @ 24 °C	Power consumption @ 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

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.

LED countdown PSF module must operate:

1. At a frequency of  $60 \pm 3$  Hz over a voltage range from 95 to 135 V(ac) without perceptible flicker to the unaided eye. Fluctuations of line voltage must have no visible effect on the luminous intensity of the indications. Rated voltage for measurements must be 120 V(ac).
2. Compatible with currently-used State 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.

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 FCC, title 47, subPart B, section 15 regulations for Class A emission limits for electronic noise.

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

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 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.

#### **86-4.03C Construction**

Not Used

#### **86-4.03D 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 elastomeric sealant or hot-melt rubberized asphalt sealant.

You may use a Type E loop where a Type A loop is shown.

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 elastomeric sealant or hot-melt rubberized asphalt sealant.

**Add to section 86-5.01:**

**86-5.01E VIDEO IMAGE VEHICLE DETECTION SYSTEM**

**86-5.01E(1) General**

**86-5.01E(1)(a) Summary**

Section 86-5.01E includes installing video image vehicle detection system (VIVDS) for traffic signals.

**86-5.01E(1)(b) Definitions**

**Video Detection Unit (VDU):** Processor unit that converts the video image from the camera and provides vehicle detection in defined zones. Unit includes an image processor, extension module, and communication card.

**Video Image Sensor Assembly (VIS):** An enclosed and environmentally-protected camera assembly used to collect the video image.

**Video Image Vehicle Detection System (VIVDS):** A system that detects video images of vehicles in defined zones and provides video output.

**86-5.01E(1)(c) Submittals**

Submit documentation within 30 days after Contract approval but before installing VIVDS equipment.

The documentation submittal must include:

1. Certificate of Compliance: s specified in Section 6-3.05E, "Certificates of Compliance," of the Standard Specifications.
2. Site Analysis Report: Written analysis for each detection site, recommending the optimum video sensor placement approved by the manufacturer.
3. Lane Configuration: Shop drawing showing:
  - 3.1. Detection zone setback
  - 3.2. Detection zone size
  - 3.3. Camera elevation
  - 3.4. Selected lens viewing angle
  - 3.5. Illustration of detection zone mapping to reporting contact output
  - 3.6. Illustration of output connector pin or wire terminal for lane assignment.
4. Configuration Record: Windows XP PC compatible CD containing:
  - 4.1. Proposed zone designs
  - 4.2. Calibration settings
5. Mounting and Wiring Information: Manufacturer approved wiring and service connection diagrams.
6. Communication Protocol: Industry standard available in public domain. Document defining:
  - 6.1. Message structure organization
  - 6.2. Data packet length
  - 6.3. Message usability
  - 6.4. Necessary information to operate a system from a remote windows based personal computer.
7. Programming Software: CD containing set up and calibration software that observes and detects the vehicular traffic, including bicycles, motorcycles, and sub-compact cars, with overlay of detection zones and allows adjustment of the detection sensitivity for a traffic signal application.
8. Detector Performance DVD Recordings and Analysis: Performance analysis based on 24-hour DVD recording of contiguous activity for each approach. Include:
  - 8.1. Two contiguous hours of sunny condition, with visible shadows projected a minimum of 6 feet into the adjacent lanes
  - 8.2. Two 1-hour night periods with vehicle headlights present.
9. Preventative Maintenance Parts Documentation: List of equipment replacement parts for preventative maintenance, including:
  - 9.1. Electrical parts
  - 9.2. Mechanical parts
  - 9.3. Assemblies.

Allow 7 days for the Engineer to review the documentation submittal.

If the Engineer requires revisions, submit a revised submittal within 5 days of receipt of the Engineer's comments and allow 5 days for the Engineer to review. If agreed to by the Engineer, revisions may be included as attachments in the resubmittal. The Engineer may conditionally approve, in writing, resubmittals that include revisions submitted as attachments, in order to allow construction activities to proceed.

Upon the Engineer's approval of the resubmittal, submit copies of the final documents (with approved revisions incorporated) to the Engineer.

Submit an acceptance testing schedule for approval 15 days before starting acceptance testing.

When beginning acceptance testing of VIVDS, submit the following:

1. Configuration Record: Windows XP PC compatible CD containing:
  - 1.1. Final zone designs
  - 1.2. Calibration settings to allow reinstallation.
2. Mounting and Wiring Information: Final wiring and service connection diagrams wrapped in clear self-adhesive plastic, placed in a heavy duty plastic envelope, and secured to the inside of the cabinet door.

### **86-5.01E(1)(d) Quality Control and Assurance**

#### **86-5.01E(1)(d)(1) General**

VIVDS and support equipment required for acceptance testing must be new and as specified in the manufacturer's recommendations. Date of manufacture, as shown by date codes or serial numbers of electronic circuit assemblies, must not be older than 12 months from the scheduled installation start date. Material substitutions must not deviate from the material list approved by the Engineer.

#### **86-5.01E(1)(d)(1)(a) Training**

Not Used

#### **86-5.01E(1)(d)(1)(b) Warranty**

Provide a written 3-year replacement warranty from the manufacturer from the date of installation against defects in materials and workmanship for VIS and VDU units. Submit all warranty documentation before the installation.

After final acceptance of VIVDS, replacement VIS and VDU must be provided within 10 days of receipt of a failed unit at no cost to the Department, except the two way shipping charges for VIS and VDU that will be paid by the Department district office that owns the equipment.

Deliver replacement VIS and VDU to Caltrans Maintenance Electrical Shop at 11325 Sanders Drive, Rancho Cordova, California 95742.

### **86-5.01E(2) Materials**

#### **86-5.01E(2)(a) General**

VIVDS must include necessary firmware, hardware, and software for designing the detection patterns or zones at the intersection or approach. Detection zones must be created with a graphic user interface designed to allow to anyone trained in VIVDS system setup to configure and calibrate a lane in less than 15 minutes.

System elements must comply with the manufacturer's recommendations and be designed to operate continuously in an outdoor environment.

All equipment, cables, and hardware must be part of an engineered system that is designed by the manufacturer to fully interoperate with all other system components. Mounting assemblies must be corrosion resistant. Connectors installed outside the cabinets and enclosures must be corrosion resistant, weather proof, and watertight. Exposed cables must be sunlight and weather resistant.

**86-5.01E(2)(a)(1) Physical and Mechanical Requirements**

VIVDS must include:

1. VIS and mounting hardware. Use a clamping device as mounting hardware on a pole or mast-arm.
2. VDU
3. Power supply
4. Surge suppression
5. Cables
6. Connectors
7. Wiring for connecting to the Department-furnished Model 332L traffic controller cabinet.
8. Communication card

**86-5.01E(2)(a)(2) Electrical**

VIVDS must operate between 90 to 135 V(ac) service as specified in NEMA TS-1. VIS, excluding the heater circuit, must draw less than 10 W of power. Power supply or transformer for the VIVDS must meet the following minimum requirements:

**Minimum Requirements for Power Supply and Transformers**

Item	Power Supply	Transformer
Power Cord	Standard 120 V(ac), 3 prong cord, 3 feet minimum length (may be added by Contractor)	Standard 120 V(ac), 3 prong cord, 3 feet minimum length (may be added by Contractor)
Type	Switching mode type	Class 2
Rated Power	Two times (2x) full system load	Two times (2x) full system load
Operating Temperature	From -37 to 74 °C	From -37 to 74 °C
Operating Humidity Range	From 5 to 95 percent	From 5 to 95 percent
Input Voltage	From 90 to 135 V(ac)	From 90 to 135 V(ac)
Input Frequency	60 ± 3 Hz	60 ± 3 Hz
Inrush Current	Cold start, 25 A Max at 115 V(ac)	N/A
Output Voltage	As required by VIVDS	As required by VIVDS
Overload Protection	From 105 to 150 percent in output pulsing mode	Power limited at >150 percent
Over Voltage Protection	From 115 to 135 percent of rated output voltage	N/A
Setup, Rise, Hold Up	800 ms, 50 ms, 15 ms at 115 V(ac)	N/A
Withstand Voltage	I/P-0/P:3 kV, I/P-FG:1.5 kV, for 60 s.	I/P-0/P:3 kV, I/P-FG:1.5 kV, for 60 s
Working Temperature	Not to exceed 70 °C at 30 percent load	Not to exceed 70 °C at 30 percent load
Safety Standards	UL 1012, UL 60950	UL 1585
EMC Standards	EN55022 Class B, EN61000-4-2, 3, 4, 5	N/A

Field terminated circuits must include transient protection as specified in IEEE Standard 587-1980, Category C. Video connections must be isolated from ground.

### **86-5.01E(2)(a)(3) Technical Requirements**

Camera and zoom lens assembly must be housed in an environmentally sealed enclosure that complies with NEMA 4 standards. Enclosure must be watertight and protected from dust. Enclosure must include a thermostat controlled heater to prevent condensation and to ensure proper lens operation at low temperatures. Adjustable sun shield that diverts water from the camera's field of view must be included. Connectors, cables and wiring must be enclosed and protected from weather. An environmentally sealed (protected from dust and moisture ingress) connector must be used at the rear plate of the housing. Wiring to the connector must be sealed with silicone or putty compound.

Each camera and its mounting hardware must be less than 10 pounds and less than 1 square foot equivalent pressure area. Only one camera must be mounted on a traffic signal or luminaire arm. Top of camera must not be more than 12 inches above top of luminaire arm or 30 inches above top of traffic signal arm.

VIS must use a charge-coupled device (CCD) element, support National Television Standards Committee (NTSC) and RS170 video output formats, and have a horizontal resolution of at least 360 lines. VIS must include an auto gain control (AGC) circuit, have a minimum sensitivity to scene luminance from 0.01 to 930 foot-candle, and produce a usable video image of vehicular traffic under all roadway lighting conditions regardless of the time of day. VIS must have a motorized lens with variable focus and zoom control with an aperture of f/1.4 or better. Focal length must allow  $\pm 50$  percent adjustment of the viewed detection scene.

A flat panel video display with a minimum 8-inch screen and that supports NTSC video output must be enclosed in the Model 332L cabinet for viewing video detector images and for performing diagnostic testing. Display must be viewable in direct sunlight. Each VIVDS must have video system connections that support the NTSC video output format, can be seen in each camera's field of view, and has a program to allow the user to switch to any video signal at an intersection. A metal shelf or pull-out document tray with metal top capable of supporting the VDU and monitor must be furnished and placed on an EIA 19 inch rack with 10-32 "Universal Spacing" threaded holes in the Model 332L cabinet. System must allow independent viewing of a scene while video recording other scenes without interfering with the operation of the system's output.

Mounting hardware must be powder-coated aluminum, stainless steel, or treated to withstand 250 hours of salt fog exposure as specified in ASTM B 117 without any visible corrosion damage.

VDU must operate between  $-37$  to  $+74$  °C and from 0 to 95 percent relative humidity.

VDU front panel must have indicators for power, communication, presence of video input for each VIS, and a real time detector output operation. Hardware or software test switch must be included to allow the user to place either a constant or momentary call for each approach. Indicators must be visible in daylight from 5 feet away.

VDU must have a serial communication port, EIA 232/USB 2.0 that supports sensor unit setup, diagnostics, and operation from a local PC compatible laptop with Windows XP or later version operating system. VIVDS must have an Ethernet communication environment, including Ethernet communication card. VIVDS must include central and field software to support remote real-time viewing and diagnostics for operational capabilities through wide area network (WAN).

VDU, image processors, extension modules, and video output assemblies must be inserted into the controller input file slots using the edge connector to obtain limited 24 V(dc) power and to provide contact closure outputs. Cabling the output file to a "D" connector on the front of the VDU is acceptable. No rewiring to the standard Model 332L cabinet is allowed. Controller cabinet resident modules must comply with the requirements in Chapter 1 and Sections 5.2.8, 5.2.8.1, 5.2.8.2, 5.4.1, 5.4.5, 5.5.1, 5.5.5, and 5.5.6 of TEES.

### **86-5.01E(2)(a)(4) Functional Requirements**

VIVDS must support normal operation of existing detection zones while a zone is being added or modified. Zone must flash or change color on a viewing monitor when vehicular traffic is detected. Length and width of each detection zone for each lane must be approved by the Engineer.

Software and firmware must detect vehicular traffic presence, provide vehicle counts, set up detection zones, test VIVDS performance, and allow video scene and system operation viewing from the local traffic management center/office. VIVDS must support a minimum of 2 separate detection patterns or zones that can be enacted by a remote operator at the signal controller cabinet.

VIVDS detection zone must detect vehicles by providing an output for presence and pulse. At least one detection output must be provided for each detection zone. One spare detection output must be provided for each approach. Detection performance must be achieved for each detection zone with a maximum of 8 user-defined zones for every camera's field of view.

VIVDS must detect the presence of vehicles under all types of adverse weather and environmental conditions, including snow, hail, fog, dirt, dust or contaminant buildup on the lens or faceplate, minor camera motion due to winds, and vibration. Under low visibility conditions, the VIVDS must respond by selecting a fail-safe default pattern, placing a constant call mode for all approaches. VIVDS outputs must assume a fail-safe "on" or "call" pattern for presence detection if video signal or power is not available and must recover from a power failure by restoring normal operations within 3 minutes without manual intervention. If powered off for more than 90 days, system must maintain the configuration and calibration information in memory.

Detection algorithm must be designed to accommodate naturally occurring lighting and environment changes, specifically the slow moving shadows cast by buildings, trees, and other objects. These changes must not result in a false detection or mask a true detection. VIVDS must not require manual interventions for day-night transition or for reflections from poles, vehicles or pavement during rain and weather changes. VIVDS must suppress blooming effects from vehicle headlights and bright objects at night.

Vehicle detection must call service to a phase only if a demand exists and extend green service to the phase until the demand is taken care of or until the flow rates have reduced to levels for phase termination. VIVDS must detect the presence of vehicular traffic at the detection zone positions and provide the call contact outputs to the Model 170E or Model 2070 controller assembly with the following performance:

**Detector Performance**

Requirements	Performance during AMBER and RED interval	Performance during GREEN interval
Average response time after vehicle enters 3 feet into detection zone or after exiting 3 feet past detection zone	≤ 1 s	≤ 100 ms
Maximum number of MISSED CALLS in 24-hour duration, where MISSED CALLS are greater than 5 s during AMBER and RED intervals and greater than 1 s during GREEN intervals (upon entering 3 feet of detection zone or after exiting 3 feet past detection zone).	0	10
Maximum number of FALSE CALLS in 24-hour duration (calls greater than 500 ms without a vehicle present)	20	20

VIVDS must be able to locally store, for each lane, vehicle count data in 5, 15, 30, and 60 minute intervals for a minimum period of 7 days and be remotely retrievable. VIVDS must count vehicular traffic in detection zone with a 95 percent accuracy or better for every hour counted over a morning or an evening peak hour. VIVDS detection zone tested must have a minimum range of 50 feet behind the limit line for each approach. Testing period will be pre-approved by the Engineer 48 hours in advance.

### **86-5.01E(3) Construction**

Install VDU in a Department-furnished Model 170E or Model 2070 controller assembly. Install VIS power supply or transformer on a standard DIN rail using standard mounting hardware and power conductors wired to DIN rail mounted terminal blocks in the controller cabinet.

Wiring must be routed through end caps or existing holes. New holes for mounting or wiring must be shop-drilled.

Wire each VIS to the controller cabinet with a wiring harness that includes all power, control wiring, and coaxial video cable. Attach harness with standard MIL type and rated plugs. Cable type and wire characteristics must comply with manufacturer's recommendations for the VIS to cabinet distance. Wiring and cables must be continuous, without splices, between the VIS and controller cabinet. Coil a minimum of 7 feet of slack in the bottom of the controller cabinet. For setup and diagnostic access, terminate serial data communication output conductors at TB-0 and continue for a minimum of 10 feet to a DB9F connector. Tape ends of unused and spare conductors to prevent accidental contact to other circuits.

Label conductors inside the cabinet for the functions depicted the approved detailed diagrams. Label cables with permanent cable labels at each end.

Adjust the lens to view 110 percent of the largest detection area dimension. Zones or elements must be logically combined into reporting contact outputs that are equivalent to the detection loops and with the detection accuracy required.

Verify the performance of each unit, individually, and submit the recorded average and necessary material at the conclusion of the performance test. Determine and document the accuracy of each unit, individually, so that each unit may be approved or rejected separately. Failure to submit necessary material at the conclusion of testing invalidates the test. The recorded media serves as acceptance evidence and must not be used for calibration. Calibration must have been completed before testing and verification.

Verify the detection accuracy by observing the VIVDS performance and recorded video images for a contiguous 24-hour period. The recorded video images must show the viewed detection scene, the detector call operation, the signal phase status for each approach, the vehicular traffic count, and time-stamp to 1/100 of a second, all overlaid on the recorded video. Transfer the 24-hour analysis to DVD.

VIVDS must meet the detection acceptance criterion specified in table titled "Detector Performance."

Calculate the VIVDS's vehicular traffic count accuracy as  $100[1 - (|TC - DC|/TC)]$ , where DC is the detector's vehicular traffic count and TC is the observed media-recorded vehicular traffic count and where the resulting fraction is expressed as an absolute value.

The Engineer will review the data findings and accept or reject the results within 7 days. Vehicle anomalies or unusual occurrences will be decided by the Engineer. Data or counts not agreed by the Engineer will be considered errors and count against the unit's calibration. If the Engineer determines that the VIVDS does not meet the performance requirements, you must re-calibrate and retest the unit, and resubmit new test data within 7 days. After 3 failed attempts, you must replace the VIVDS with a new unit.

Notify the Engineer 20 days before the unit is ready for acceptance testing. Acceptance testing must be scheduled to be completed before the end of a normal work shift. You must demonstrate that all VIS and VDUs satisfy the functional requirements.

### **86-5.01E(4) Payment**

Not Used

**Replace section 86-5.02 with:**

**86-5.02 ACCESSIBLE PEDESTRIAN SIGNAL**

**86-5.02A General**

**86-5.02A(1) Summary**

Section 86-5.02 includes specifications for installing accessible pedestrian signal (APS). Comply with TEES.

**86-5.02A(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 connects a pedestrian push button to an APS electronic device to actuate the components of the APS.

**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*.

**86-5.02A(3) Submittals**

Submit the APS wiring diagram and product data.

Submit 2 APS user and operator manuals for each signalized location. Manuals must include a master item index that describes the purpose of each manual and 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, 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 APS to the job site, submit all APSs (if more than one) and the following to METS:

1. Delivery form including contract number and contact information
2. List containing all APS serial numbers
3. Manufacturer's name, trademark, model number, 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.

**86-5.02A(4) Quality Control and Assurance**

**86-5.02A(4)(a) General**

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

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

The Department may test all APSs. Comply with section 86-2.14A.

All functional and dimensional parameters of these specifications may be tested on the APS.

### **86-5.02A(4)(b) Functional Testing**

Field tests must be completed twice, when traffic is noisy (e.g. peak traffic hours) and when traffic is quiet (e.g. off peak hours). Notify the Engineer 15 days before testing the APS.

### **86-5.02A(4)(c) Warranty**

Provide a 2-year replacement warranty from the manufacturer from the date of installation against any defects or failures. Submit all warranty documentation before installation.

Provide replacement parts within 10 days after receipt of the failed parts. Deliver the replacement parts to the following Department Maintenance Electrical Shop at 11325 Sanders Drive Rancho Cordova, California 95742.

### **:86-5.02A(4)(d) Training**

Provide a minimum of 4 hours of training by a certified manufacturer's representative for up to 4 Department employees selected by the Engineer. The content of the training must include instruction on how to install, program, adjust, calibrate, and maintain the APS.

Provide 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 will determine the time and location.

### **86-5.02B 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 inches
2. Vibrotactile device on the push button or on the arrow.
3. Enclosure with an ambient sound level sensing microphone and weatherproof speaker. A 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 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 the 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.

Nine No. 20 conductor cable complying with MIL-W-16878D must be used between the APS PPB assembly and the pedestrian signal head. Wiring must comply with section 13.02 of ITE publication, Equipment and Material Standards, chapter 2, "Vehicle Traffic Control Signal Heads" and NEC, rated for service at +105 °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. Programming mechanism must be submitted to the Engineer upon successful APS installation.

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 pedestrian push buttons, when pressed, must activate the pedestrian "walk" signal timing.
3. Provide information using:
  - 3.1. Audible speech walk message 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 five 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 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.

### **86-5.02C Construction**

Arrange, at your expense, to have a manufacturer's representative qualified to work on APS present whenever the equipment is installed, modified, connected, and reconnected. The Department does not pay for this work.

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 adjustment to deliver the performance specified. Provide the equipment and hardware required to install, set up, calibrate, and verify the performance of the APS.

### **86-5.02D Payment**

Not used

## **Replace section 86-6.01 with:**

### **86-6.01 LED LUMINAIRES**

#### **86-6.01A General**

##### **86-6.01A(1) Summary**

Section 86-6.01 includes specifications for installing LED luminaires.

##### **86-6.01A(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.

### **86-6.01A(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 86-6.01 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.

### **86-6.01A(4) Quality Control and Assurance**

#### **86-6.01A(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 86-6.01 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 kΩ. 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 86-6.01 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 86-6.01, 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.

**86-6.01A(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:

Sacramento maintenance electrical shop  
 11325 Sanders Drive  
 Rancho Cordova, CA 95742

**86-6.01B Materials**

**86-6.01B(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.

**86-6.01B(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

**86-6.01B(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

**86-6.01B(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.

**86-6.01B(5) Compatibility**

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

**86-6.01B(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 <math>y \geq 0</math> (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

#### **86-6.01B(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.

#### **86-6.01B(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 green color no. 34108 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  $\pm 5$  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 <sup>a</sup>	Installed	1.5 g peak-to-peak sinusoidal loading (same as 0.75 g peak)

<sup>a</sup>Perpendicular to the direction of the mast arm



**Add to section 90-2.02B:**

You may use rice hull ash as an SCM. Rice hull ash must comply with AASHTO M 321 and the chemical and physical requirements shown in the following tables:

Chemical property	Requirement (percent)
Silicon dioxide (SiO <sub>2</sub> ) <sup>a</sup>	90 min
Loss on ignition	5.0 max
Total alkalis as Na <sub>2</sub> O equivalent	3.0 max

Physical property	Requirement
Particle size distribution	
Less than 45 microns	95 percent
Less than 10 microns	50 percent
Strength activity index with portland cement <sup>b</sup>	
7 days	95 percent (min percent of control)
28 days	110 percent (min percent of control)
Expansion at 16 days when testing project materials under ASTM C 1567 <sup>c</sup>	0.10 percent max
Surface area when testing by nitrogen adsorption under ASTM D 5604	40.0 m <sup>2</sup> /g min

<sup>a</sup>SiO<sub>2</sub> in crystalline form must not exceed 1.0 percent.

<sup>b</sup>When tested under AASHTO M 307 for strength activity testing of silica fume.

<sup>c</sup>In the test mix, Type II or V portland cement must be replaced with at least 12 percent rice hull ash by weight.

For the purpose of calculating the equations for the cementitious material specifications, consider rice hull ash to be represented by the variable *UF*.

**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	<a href="http://www.dot.ca.gov/hq/esc/oe/weekly_ads/all_advertised.php">http://www.dot.ca.gov/hq/esc/oe/weekly_ads/all_advertised.php</a>	--	--
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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 VECsPs

10-19-12

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

, including VECsPs

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.

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## **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.

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**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:**

04-20-12

$$Qh = HMATT \times Xa$$

**Replace "weight of dry aggregate" in the definition of the variable *Xa* in section 9-1.07B(2) with:**

04-20-12

total weight of HMA

**Replace the formula in section 9-1.07B(3) with:**

04-20-12

$$Qrh = RHMATT \times 0.80 \times Xarb$$

**Replace "weight of dry aggregate" in the definition of the variable *Xarb* in section 9-1.07B(3) with:**

04-20-12

total weight of rubberized HMA

**Replace the heading of section 9-1.07B(4) with:**

04-20-12

**Hot Mix Asphalt with Modified Asphalt Binder**

**Add between "in" and "modified" in the introductory clause of section 9-1.07B(4):**

04-20-12

HMA with

**Replace the formula in section 9-1.07B(4) with:**

04-20-12

$$Qmh = MHMATT \times [(100 - Xam) / 100] \times Xmab$$

**Replace "weight of dry aggregate" in the definition of the variable *Xmab* in section 9-1.07B(4) with:**

04-20-12

total weight of HMA

**Replace the formula in section 9-1.07B(5) with:**

04-20-12

$$Qrap = HMATT \times Xaa$$

**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







**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  $7 \pm 1$  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  $140 \pm 2$  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  $\pm 2.0$  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  $\pm 2.0$  percent of the average binder content of the original processed RAP stockpile.

The maximum specific gravity for processed RAP must be within  $\pm 0.06$  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  $\pm 0.060$  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

<sup>a</sup> 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) <sup>a</sup>			
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) <sup>a</sup>			
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 <sup>a</sup>	120	120	--
Moisture susceptibility (tensile strength ration, %)	California Test 371 <sup>a</sup>	70	70	--

<sup>a</sup>Test 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:

- California Test 371 tensile strength ratio and minimum dry strength test results
- 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  $\pm 2.0$  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  $\pm 2.0$  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  $\pm 5$  percent.

For RAP substitution greater than 15, you may adjust the RAP by  $\pm 3$  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 <sup>a</sup>	California Test 202	1 per 750 tons and any remaining part at the end of the project	JMF ± Tolerance <sup>b</sup>			
Sand equivalent (min) <sup>c</sup>	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) <sup>d,e</sup>	QC plan	2 per business day (min.)	91–97	91–97	91–97	--
Stabilometer value (min) <sup>c</sup> 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 (%) <sup>c,f</sup>	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 <sup>g</sup>	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) <sup>h</sup>	California Test 234		45	45	45	--
Voids filled with asphalt (%) <sup>i</sup> 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) <sup>i</sup> 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 <sup>l</sup> 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) <sup>j</sup> 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) <sup>j</sup> 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) <sup>j</sup>	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, %) <sup>j</sup>	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 <sub>0</sub>			
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

<sup>a</sup> Determine combined aggregate gradation containing RAP under California Test 367.

<sup>b</sup> The tolerances must comply with the allowable tolerances in section 39-1.02E.

<sup>c</sup> Report the average of 3 tests from a single split sample.

<sup>d</sup> 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.

<sup>e</sup> 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.

<sup>f</sup> 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.

<sup>g</sup> For adjusting the plant controller at the HMA plant.

<sup>h</sup> 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.

<sup>i</sup> Report only.

<sup>j</sup> 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 <sup>a</sup>				California Test 202	JMF ± tolerance <sup>c</sup>			
Sieve	3/4"	1/2"	3/8"					
1/2"	X <sup>b</sup>							
3/8"		X						
No. 4			X					
No. 8	X	X	X					
No. 200	X	X	X					
Sand equivalent (min) <sup>d</sup>				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) <sup>e, f</sup>				California Test 375	91–97	91–97	91–97	--
Stabilometer value (min) <sup>d</sup>				California Test 366	30	30	--	--
No. 4 and 3/8" gradings								
1/2" and 3/4" gradings					37	35	23	--
Air void content (%) <sup>d, g</sup>				California Test 367	4 ± 2	4 ± 2	TV ± 2	--
Percent of crushed particles				California Test 205				
Coarse aggregate (% min)								
One fractured face								
Two fractured faces								
Fine aggregate (% min)				California Test 205				
(Passing no. 4 sieve and retained on no. 8 sieve.)								
One fractured face								
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) <sup>h</sup>				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 (%) <sup>i</sup>				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) <sup>i</sup>				California Test 367				
No. 4 grading								
3/8" grading								
1/2" grading								
3/4" grading					17.0	17.0	--	--
					15.0	15.0	--	--
					14.0	14.0	18.0–23.0	18.0–23.0
					13.0	13.0	18.0–23.0	18.0–23.0
Dust proportion <sup>i</sup>				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) <sup>j</sup> 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) <sup>j</sup> 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) <sup>j</sup>	California Test 371	120	120	--	--
Moisture susceptibility (tensile strength ration, %) <sup>j</sup>	California Test 371	70	70	--	--
Smoothness	Section 39-1.12	12-foot straight- edge, must grind, and PI <sub>0</sub>	12-foot straight- edge, must grind, and PI <sub>0</sub>	12-foot straight- edge, must grind, and PI <sub>0</sub>	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

<sup>a</sup> The Engineer determines combined aggregate gradations containing RAP under California Test 367.

<sup>b</sup> "X" denotes the sieves the Engineer tests for the specified aggregate gradation.

<sup>c</sup> The tolerances must comply with the allowable tolerances in section 39-1.02E.

<sup>d</sup> The Engineer reports the average of 3 tests from a single split sample.

<sup>e</sup> 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.

<sup>f</sup> 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.

<sup>g</sup> 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.

<sup>h</sup> 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.

<sup>i</sup> Report only.

<sup>j</sup> 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 <sup>a</sup>	California Test 202	JMF ± tolerance <sup>b</sup>	JMF ± tolerance <sup>b</sup>	JMF ± tolerance <sup>b</sup>	JMF ± tolerance <sup>b</sup>
Sand equivalent (min) <sup>c</sup>	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) <sup>c</sup> No. 4 and 3/8" gradings 1/2" and 3/4" gradings	California Test 366	30 37	30 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 75 70	25 -- 20	-- 90 70	90 75 90
Los Angeles Rattler (% max) Loss at 100 rev. Loss at 500 rev.	California Test 211	12 45	-- 50	12 40	12 40
Air void content (%) <sup>c, d</sup>	California Test 367	4 ± 2	4 ± 2	TV ± 2	--
Fine aggregate angularity (% min) <sup>e</sup>	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 (%) <sup>f</sup> 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) <sup>f</sup> 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 <sup>g</sup> 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) <sup>g</sup> PG-58 PG-64	AASHTO T 324 (Modified)	10,000 15,000	10,000 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) <sup>g</sup>	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) <sup>g</sup>	California Test 371	120	120	--	--
Moisture susceptibility (tensile strength ration, %) <sup>g</sup>	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

<sup>a</sup> The Engineer determines combined aggregate gradations containing RAP under California Test 367.

<sup>b</sup> The tolerances must comply with the allowable tolerances in section 39-1.02E.

<sup>c</sup> The Engineer reports the average of 3 tests from a single split sample.

<sup>d</sup> 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.

<sup>e</sup> 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.

<sup>f</sup> Report only.

<sup>g</sup> 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 <sup>a</sup>	California Test 202	1 per 750 tons	JMF ± tolerance <sup>b</sup>	JMF ± tolerance <sup>b</sup>	JMF ± tolerance <sup>b</sup>	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) <sup>c,d</sup>	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 <sup>e</sup>	California Test 226 or 370	2 per day during production	--	--	--	Stock-piles or cold feed belts	--
Sand equivalent (min) <sup>f</sup>	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) <sup>f</sup>	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 (%) <sup>f,g</sup>	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) <sup>h</sup>	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 (%) <sup>i</sup>  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.) <sup>i</sup>  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 <sup>i</sup>	California Test 367							
No. 4 and 3/8" gradings 1/2" and 3/4" gradings			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) <sup>i</sup> 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 greater	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) <sup>i</sup> 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 greater	10,000 10,000 12,500 15000	10,000 10,000 12,500 15000	--	--		
Moisture susceptibility (minimum dry strength, psi) <sup>j</sup>	California Test 371	1 per 10,000 tons or 1 per project whichever is greater	120	120	--	--		
Moisture susceptibility (tensile strength ratio, %) <sup>j</sup>	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 <sub>0</sub>	12-foot straight-edge, must-grind, and Pl <sub>0</sub>	12-foot straight-edge, must-grind, and Pl <sub>0</sub>	--		
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	

- <sup>a</sup> Determine combined aggregate gradation containing RAP under California Test 367.
- <sup>b</sup> The tolerances must comply with the allowable tolerances in section 39-1.02E.
- <sup>c</sup> 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.
- <sup>d</sup> 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.
- <sup>e</sup> For adjusting the plant controller at the HMA plant.
- <sup>f</sup> Report the average of 3 tests from a single split sample.
- <sup>g</sup> 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.
- <sup>h</sup> 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.
- <sup>i</sup> Report only.
- <sup>j</sup> 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 <sup>a</sup>				California Test 202	JMF ± Tolerance <sup>c</sup>		
	Sieve	3/4"	1/2"	3/8"					
1	1/2"	X <sup>b</sup>	--	--	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) <sup>d, e</sup>				0.40	California Test 375	92–96	92–96	91–96
	Sand equivalent (min) <sup>f</sup>					California Test 217	47	42	47
	Stabilometer value (min) <sup>f</sup> No. 4 and 3/8" gradings 1/2" and 3/4" gradings					California Test 366	30 37	30 35	-- 23
	Air void content (%) <sup>f, g</sup>					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) <sup>h</sup>					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) <sup>i</sup> 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 (%) <sup>i</sup> 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 <sup>1</sup> 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) <sup>j</sup> 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) <sup>j</sup> 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) <sup>j</sup>		California Test 371	120	120	--
	Moisture susceptibility (tensile strength ratio %) <sup>j</sup>		California Test 371	70	70	70
	Smoothness		Section 39-1.12	12-foot straight-edge, must grind, and PI <sub>0</sub>	12-foot straight-edge, must grind, and PI <sub>0</sub>	12-foot straight-edge, must grind, and PI <sub>0</sub>
	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

- <sup>a</sup> The Engineer determines combined aggregate gradations containing RAP under California Test 367.
- <sup>b</sup> "X" denotes the sieves the Engineer tests for the specified aggregate gradation.
- <sup>c</sup> The tolerances must comply with the allowable tolerances in section 39-1.02E.
- <sup>d</sup> 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.
- <sup>e</sup> 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.
- <sup>f</sup> The Engineer reports the average of 3 tests from a single split sample.
- <sup>g</sup> 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.
- <sup>h</sup> 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.
- <sup>i</sup> Report only.
- <sup>j</sup> 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:

<b>Tie Bar Tolerance</b>	
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  $20 \pm 5$  feet from the transverse construction joint formed at each day's start of paving and  $1 \pm 0.25$  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:

<b>Zinc Coating System</b>		
Description	Coating	Dry film thickness (mils)
<b>All new surfaces:</b>		
Undercoat	Inorganic zinc primer, AASHTO M 300 Type I or II	4–8
Finish coat <sup>a</sup>	Exterior grade latex <sup>b</sup> , 2 coats	2 minimum each coat, 4–8 total
Total thickness, all coats		8–14
<b>Connections to existing structural steel:<sup>c</sup></b>		
Undercoat	Inorganic zinc primer, AASHTO M 300 Type I or II	4–8
Finish coat <sup>a</sup>	Exterior grade latex <sup>b</sup> , 2 coats	2 minimum each coat, 4–8 total
Total thickness, all coats		8–14

<sup>a</sup>If no finish coats are described, a final coat of inorganic zinc primer is required.

<sup>b</sup>Exterior grade latex must comply with section 91-2.02 unless otherwise specified.

<sup>c</sup>Includes 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 <sup>a</sup> :	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

<sup>a</sup>Includes 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 <sup>-1</sup> 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 <sup>-1</sup> 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:



