



STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

**NOTICE TO BIDDERS
AND
SPECIAL PROVISIONS**

**FOR CONSTRUCTION ON STATE HIGHWAY IN SANTA BARBARA COUNTY IN
GOLETA FROM 0.2 MILE EAST TO 0.7 MILE WEST OF FAIRVIEW AVENUE
OVERCROSSING**

In District 05 On Route 101

Under

Bid book dated August 26, 2013

Standard Specifications dated 2010

Project plans approved April 29, 2013

Standard Plans dated 2010

Identified by

Contract No. 05-0G0704

05-SB-101-22.3/23.0

Project ID 0500000055

Federal-Aid Project

ACNH-Q101(233)E

Electronic Advertising Contract

Bids open Tuesday, October 15, 2013
Dated August 26, 2013

OSD
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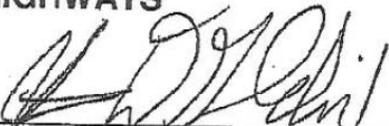
SPECIAL NOTICES

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

CONTRACT NO. 05-0G0704

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

HIGHWAYS


REGISTERED CIVIL ENGINEER

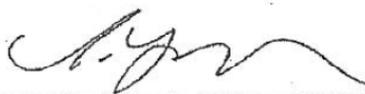


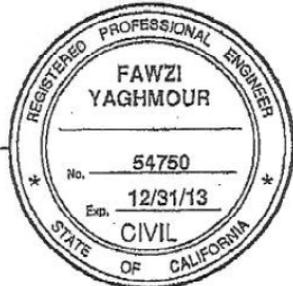
ELECTRICAL


REGISTERED ELECTRICAL ENGINEER



TRAFFIC


REGISTERED CIVIL ENGINEER



LANDSCAPE


LICENSED LANDSCAPE ARCHITECT



CONTRACT NO. 05-0G0704

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

STRUCTURES

R. Vaikunthan

4/24/2013

REGISTERED STRUCTURAL ENGINEER Date



SECTION 77- WATER PIPELINE

Vernon E. Williams

REGISTERED CIVIL ENGINEER



SECTION 77- SEWER LINE

David W. Rundle

REGISTERED CIVIL ENGINEER



TABLE OF CONTENTS

NOTICE TO BIDDERS	1
BID ITEM LIST.....	3
SPECIAL PROVISIONS	13
DIVISION I GENERAL PROVISIONS	13
1 GENERAL.....	13
2 BIDDING.....	13
5 CONTROL OF WORK.....	14
8 PROSECUTION AND PROGRESS	15
9 PAYMENT	17
DIVISION II GENERAL CONSTRUCTION	17
10 GENERAL.....	17
12 TEMPORARY TRAFFIC CONTROL.....	18
13 WATER POLLUTION CONTROL.....	29
14 ENVIRONMENTAL STEWARDSHIP	29
15 EXISTING FACILITIES.....	41
DIVISION III GRADING	43
16 CLEARING AND GRUBBING	43
19 EARTHWORK	43
20 LANDSCAPE.....	47
20-3.01C(3) Control and Neutral Conductors Schedule of Values	48
DIVISION IV SUBBASES AND BASES	56
25 AGGREGATE SUBBASES	56
28 CONCRETE BASES	56
DIVISION V SURFACINGS AND PAVEMENTS.....	56
39 HOT MIX ASPHALT	56
DIVISION VI STRUCTURES.....	75
49 PILING.....	75
51 CONCRETE STRUCTURES.....	77
55 STEEL STRUCTURES.....	78
DIVISION VII DRAINAGE.....	78
64 PLASTIC PIPE	78
66 CORRUGATED METAL PIPE.....	78

70 MISCELLANEOUS DRAINAGE FACILITIES.....	79
DIVISION VIII MISCELLANEOUS CONSTRUCTION.....	79
72 SLOPE PROTECTION.....	79
73 CONCRETE CURBS AND SIDEWALKS.....	80
77 LOCAL INFRASTRUCTURE.....	81
80 FENCES.....	98
DIVISION IX TRAFFIC CONTROL FACILITIES.....	99
83 RAILINGS AND BARRIERS.....	99
84 TRAFFIC STRIPES AND PAVEMENT MARKINGS.....	103
86 ELECTRICAL SYSTEMS.....	104
DIVISION X MATERIALS.....	118
90 CONCRETE.....	118
REVISED STANDARD SPECIFICATIONS APPLICABLE TO THE 2010 EDITION OF THE STANDARD SPECIFICATIONS.....	120

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)
A10F	Legend - Soil (Sheet 1 of 2)
A10G	Legend - Soil (Sheet 2 of 2)
A10H	Legend - Rock
A20A	Pavement Markers and Traffic Lines, Typical Details
A20B	Pavement Markers and Traffic Lines, Typical Details
A20C	Pavement Markers and Traffic Lines, Typical Details
A20D	Pavement Markers and Traffic Lines, Typical Details
RSP A24A	Pavement Markings - Arrows
A24B	Pavement Markings - Arrows and Symbols
RSP A24C	Pavement Markings - Symbols and Numerals
A24D	Pavement Markings - Words
RSP A24E	Pavement Markings - Words, Limit and Yield Lines
RSP A24F	Pavement Markings - Crosswalks
A40B	Shoulder Rumble Strip Details - Ground-In Indentations
A62A	Excavation and Backfill - Miscellaneous Details
A62B	Limits of Payment for Excavation and Backfill - Bridge Surcharge and Wall
A62C	Limits of Payment for Excavation and Backfill - Bridge
A62D	Excavation and Backfill - Concrete Pipe Culverts
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
A74	Survey Monuments
A76A	Concrete Barrier Type 60

A76C	Concrete Barrier Type 60F
A77A2	Metal Beam Guard Railing - Standard Railing Section (Steel Post with Notched Wood or Notched Recycled Plastic Block)
A77B1	Metal Beam Guard Railing - Standard Hardware
A77C2	Metal Beam Guard Railing - Steel Post and Notched 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
RSP A77C5	Metal Beam Guard Railing - Typical Vegetation Control Standard Railing Section
RSP A77C6	Metal Beam Guard Railing - Typical Vegetation Control for Terminal System End Treatments
RSP A77C7	Metal Beam Guard Railing - Typical Vegetation Control at Structure Approach
RSP A77C8	Metal Beam Guard Railing - Typical Vegetation Control at Fixed Object
RSP A77C9	Metal Beam Guard Railing - Typical Vegetation Control at Fixed Object
RSP A77C10	Metal Beam Guard Railing - Typical Vegetation Control at Fixed Object
A77E1	Metal Beam Guard Railing - Typical Layouts for Embankments
A77F1	Metal Beam Guard Railing - Typical Layouts for Structure Approach
A77F2	Metal Beam Guard Railing - Typical Layouts for Structure Approach and Between Structures
A77F4	Metal Beam Guard Railing - Typical Layouts for Structure Departure
A77F5	Metal Beam Guard Railing - Typical Layouts for Structure Departure
A77H1	Metal Railing - End Anchor Assembly (Type SFT)
A77H2	Metal Railing - Rail Tensioning Assembly
A77H3	Metal Railing - Anchor Cable and Anchor Plate Details
A77I2	Metal Beam Guard Railing - Buried Post End Anchor
A77J1	Metal Beam Guard Railing - Connections to Bridge Railings without Sidewalks Details No. 1
A77J2	Metal Beam Guard Railing - Connections to Bridge Railings without Sidewalks Details No. 2
A77J4	Metal Beam Guard Railing - Transition Railing (Type WB)
A78B	Thrie Beam Barrier - Standard Barrier Railing Section (Steel Post with Notched Wood Block or Notched Recycled Plastic Block)
A78C1	Thrie Beam Barrier - Standard Hardware Details
A78C2	Thrie Beam Barrier - Post and Block Details
RSP A78C3	Single Thrie Beam Barrier - Typical Vegetation Control Standard Barrier Railing Section
RSP A78C4	Double Thrie Beam Barrier - Typical Vegetation Control Standard Barrier Railing Section
RSP A78C5	Thrie Beam Barrier - Typical Vegetation Control at Fixed Objects in Median
RSP A78C6	Thrie Beam Barrier - Typical Vegetation Control at Structure Approach
A78E1	Single Thrie Beam Barrier - End Anchor Assembly and Terminal System End Treatment
A78E2	Double Thrie Beam Barrier - Emergency Passageway and End Anchor Assembly

	Details
A78I	Double Thrie Beam Barrier - Connection to Concrete Barrier
A78J	Single Thrie Beam Barrier - Transition Railing (Type STB)
A78K	Double Thrie Beam Barrier - Transition Railing (Type DTB)
A85	Chain Link Fence
A85A	Chain Link Fence Details
RSP A85B	Chain Link Fence Details
A86A	Barbed Wire and Wire Mesh Fence Detail on Sharp Break in Grade
A87A	Curbs and Driveways
A87B	Hot Mix Asphalt Dikes
D71	Drainage Inlet Markers
D72	Drainage Inlets
RSP D73	Drainage Inlets
D73A	Drainage Inlets (Precast)
D74A	Drainage Inlets
D74B	Drainage Inlets
D74C	Drainage Inlet Details
D75A	Steel Pipe Inlets
RSP D77A	Grate Details No. 1
RSP D77B	Grate Details No. 2
D77C	Alternative Hinged Cover for Type OL and OS Inlets and Trash Rack for Type OCP Inlet
D78A	Gutter Depressions
D78B	Inlet Depressions - Concrete Shoulders
D78C	Inlet Depressions - Hot Mix Asphalt Shoulders
D87D	Overside Drains
D88	Construction Loads on Culverts
D88A	Strut Details for Structural Steel Pipes, Arches and Vehicular Undercrossing
D91A	Cast-In-Place Reinforced Concrete - Junction Structure
D91B	Cast-In-Place Reinforced Concrete - Junction Structure
D94A	Metal and Plastic Flared End Sections
D94B	Concrete Flared End Sections
D97A	Corrugated Metal Pipe Coupling Details No. 1 - Annular Coupling Band Bar and Strap and Angle Connections
D97C	Corrugated Metal Pipe Coupling Details No. 3 - Helical and Universal Couplers
D97D	Corrugated Metal Pipe Coupling Details No. 4 - Hugger Coupling Bands
D97E	Corrugated Metal Pipe Coupling Details No. 5 - Standard Joint

D97F	Corrugated Metal Pipe Coupling Details No. 6 - Positive Joint
D97G	Corrugated Metal Pipe Coupling Details No. 7 - Downdrain
D97H	Reinforced Concrete Pipe or Non-Reinforced Concrete Pipe - Standard and Positive Joints
D97I	Corrugated Polyvinyl Chloride Pipe with Smooth Interior - Standard and Positive Joints
D97J	Composite Steel Spiral Rib Pipe with Smooth Interior - Standard Joint
D98A	Slotted Corrugated Steel Pipe Drain Details
D98B	Slotted Corrugated Steel Pipe Drain Details
D98C	Grated Line Drain Details
D99A	Structural Section Drainage System Details
D99B	Edge Drain Outlet and Vent Details
D99C	Edge Drain Cleanout and Vent Details
D99D	Cross Drain Interceptor Details
D100A	Gabion Basket Details No. 1
D100B	Gabion Basket Details No. 2
H1	Landscape and Erosion Control - Abbreviations
H2	Landscape - Symbols
H3	Landscape Details
H4	Landscape Details
H5	Landscape Details
H6	Landscape Details
H7	Landscape Details
H9	Landscape Details
H51	Erosion Control Details - Fiber Roll and Compost Sock
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)
RSP T9	Traffic Control System for Lane Closure on Freeways and Expressways
RSP T10	Traffic Control System for Lane Closure on Freeways and Expressways
RSP T11	Traffic Control System for Lane Closure on Multilane Conventional Highways
RSP T13	Traffic Control System for Lane Closure on Two Lane Conventional Highways
RSP T14	Traffic Control System for Ramp Closure

T51	Temporary Water Pollution Control Details (Temporary Silt Fence)
T53	Temporary Water Pollution Control Details (Temporary Cover)
T54	Temporary Water Pollution Control Details (Temporary Erosion Control Blanket)
T55	Temporary Water Pollution Control Details (Temporary Erosion Control Blanket)
T56	Temporary Water Pollution Control Details (Temporary Fiber Roll)
T57	Temporary Water Pollution Control Details (Temporary Check Dam)
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)]
T66	Temporary Water Pollution Control Details (Temporary Large Sediment Barrier)
B0-1	Bridge Details
B0-3	Bridge Details
B0-5	Bridge Details
B0-13	Bridge Details
B2-8	Pile Details - Class 200
B6-21	Joint Seals (Maximum Movement Rating = 2")
B11-52	Chain Link Railing Type 7
RSP B11-60	Concrete Barrier Type 80 (Sheet 1 of 2)
B11-61	Concrete Barrier Type 80 (Sheet 2 of 2)
B11-66	California ST-40 Bridge Rail (Sheet 1 of 2)
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
S1	Overhead Signs - Truss, Instructions and Examples
S2	Overhead Signs - Truss, Single Post Type - Post Types II thru IX
S3	Overhead Signs - Truss, Single Post Type - Base Plate and Anchorage Details
S4	Overhead Signs - Truss, Single Post Type - Structural Frame Members Details No. 1
S5	Overhead Signs - Truss, Single Post Type - Structural Frame Members Details No. 2
S6	Overhead Signs - Truss, Gusset Plate Details
S8	Overhead Signs - Truss, Single Post Type - Round Pedestal Pile Foundation

S16	Overhead Signs - Walkway Details No. 1
S17	Overhead Signs - Walkway Details No. 2
S17A	Overhead Signs - Walkway Details No. 3
S18	Overhead Signs - Walkway Safety Railing Details
S19	Overhead Signs - Truss, Sign Mounting Details - Laminated Panel - Type A
S86	Laminated Panel Details - Extrusions for Type A, B and H Panels
S87	Type A-1 Mounting Hardware - Overhead Laminated Type A Panel, Truss and Lightweight Sign Structures
S89	Roadside Sign - Formed Single Sheet Aluminum Panel
S92	Overhead Sign - Formed Sign Panel
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-5A	Electrical Systems (Detectors)
ES-5B	Electrical Systems (Detectors)
ES-5D	Electrical Systems (Curb Termination and Handhole)
ES-6E	Electrical Systems (Lighting Standard, Types 30 and 31)
ES-6G	Electrical Systems (Lighting Standard, Type 32)
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)
RSP ES-8A	Electrical Systems (Pull Box)
RSP ES-8B	Electrical Systems (Traffic Rated Pull Box)
RSP ES-10A	Electrical Systems (Isofootcandle Diagrams)
RSP ES-10B	Electrical Systems (Isofootcandle Diagrams)
ES-11	Electrical Systems (Foundation Installations)
ES-13A	Electrical Systems (Splicing Details)
ES-13B	Electrical Systems (Fuse Rating, Kinking and Banding Detail)
ES-15A	Electrical Systems (Sign Illumination Equipment)
ES-15C	Electrical Systems (Sign Illumination Equipment)
ES-15D	Electrical Systems (Lighting and Sign Illumination Control)

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, October 15, 2013

Dated August 26, 2013

General work description: UPGRADE DRAINAGE CULVERTS

The Department will receive sealed bids for CONSTRUCTION ON STATE HIGHWAY IN SANTA BARBARA COUNTY IN GOLETA FROM 0.2 MILE EAST TO 0.7 MILE WEST OF FAIRVIEW AVENUE OVERCROSSING.

District-County-Route-Post Mile: 05-SB-101-22.3/23.0

Contract No. 05-0G0704

The Contractor must have either a Class A license or any combination of the following Class C licenses which constitutes a majority of the work: C-8, C-12.

The DBE Contract goal is 8 percent.

Federal-aid project no.:

ACNH-Q101(233)E

For the Federal training program, the number of trainees or apprentices is 31.

Bids must be on a unit price basis.

Complete the work, excluding plant establishment work, within 450 working days.

Complete the work, including plant establishment work, within 700 working days.

Complete the plant establishment work within 250 working days.

The estimated cost of the project is \$15,600,000.

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

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

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

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

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

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

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

Department of Transportation

LD

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	450
4	120090	CONSTRUCTION AREA SIGNS	LS	LUMP SUM
5	120100	TRAFFIC CONTROL SYSTEM	LS	LUMP SUM
6	120120	TYPE III BARRICADE	EA	23
7	120149	TEMPORARY PAVEMENT MARKING (PAINT)	SQFT	580
8	120159	TEMPORARY TRAFFIC STRIPE (PAINT)	LF	117,000
9	120165	CHANNELIZER (SURFACE MOUNTED)	EA	610
10	128652	PORTABLE CHANGEABLE MESSAGE SIGN (LS)	LS	LUMP SUM
11	129000	TEMPORARY RAILING (TYPE K)	LF	46,800
12	129100	TEMPORARY CRASH CUSHION MODULE	EA	310
13	130100	JOB SITE MANAGEMENT	LS	LUMP SUM
14	130300	PREPARE STORM WATER POLLUTION PREVENTIONPLAN	LS	LUMP SUM
15	130310	RAIN EVENT ACTION PLAN	EA	50
16	130320	STORM WATER SAMPLING AND ANALYSIS DAY	EA	23
17	130330	STORM WATER ANNUAL REPORT	EA	3
18	130505	MOVE-IN/MOVE-OUT (TEMPORARY EROSION CONTROL)	EA	5
19	130530	TEMPORARY HYDRAULIC MULCH (BONDED FIBER MATRIX)	SQYD	27,000
20	130610	TEMPORARY CHECK DAM	LF	30

Item No.	Item Code	Item Description	Unit of Measure	Estimated Quantity
21	130620	TEMPORARY DRAINAGE INLET PROTECTION	EA	43
22	130640	TEMPORARY FIBER ROLL	LF	10,000
23	130650	TEMPORARY GRAVEL BAG BERM	LF	960
24	130660	TEMPORARY LARGE SEDIMENT BARRIER	LF	3,500
25	130680	TEMPORARY SILT FENCE	LF	100
26	130710	TEMPORARY CONSTRUCTION ENTRANCE	EA	6
27	130730	STREET SWEEPING	LS	LUMP SUM
28	130900	TEMPORARY CONCRETE WASHOUT	LS	LUMP SUM
29	141000	TEMPORARY FENCE (TYPE ESA)	LF	5,660
30	141120	TREATED WOOD WASTE	LB	68,200
31	146002	CONTRACTOR-SUPPLIED BIOLOGIST (LS)	LS	LUMP SUM
32	146003	NATURAL RESOURCE PROTECTION PLAN	LS	LUMP SUM
33	150209	ABANDON DRAINAGE FACILITY	EA	2
34	150604	REMOVE WOOD FENCE	LF	16
35	150608	REMOVE CHAIN LINK FENCE	LF	2,420
36	025865	REMOVE MASONRY BLOCK WALL	LF	12
37	150662	REMOVE METAL BEAM GUARD RAILING	LF	1,480
38	025866	REMOVE SINGLE THRIE BEAM BARRIER	LF	1,950
39	025867	REMOVE DOUBLE THRIE BEAM BARRIER	LF	1,430
40	150685	REMOVE IRRIGATION FACILITY	LS	LUMP SUM

Item No.	Item Code	Item Description	Unit of Measure	Estimated Quantity
41	150711	REMOVE PAINTED TRAFFIC STRIPE	LF	12,100
42	150714	REMOVE THERMOPLASTIC TRAFFIC STRIPE	LF	4,550
43	150722	REMOVE PAVEMENT MARKER	EA	1,120
44	150757	REMOVE SIGN STRUCTURE (EA)	EA	1
45	150770	REMOVE ASPHALT CONCRETE PAVEMENT (SQFT)	SQFT	96
46	150771	REMOVE ASPHALT CONCRETE DIKE	LF	1,130
47	150818	REMOVE REINFORCED CONCRETE BOX CULVERT (CY)	CY	1,270
48	150820	REMOVE INLET	EA	2
49	150821	REMOVE HEADWALL	EA	4
50	152316	RESET ROADSIDE SIGN (ONE POST)	EA	2
51	153103	COLD PLANE ASPHALT CONCRETE PAVEMENT	SQYD	40,300
52	153221	REMOVE CONCRETE BARRIER	LF	900
53	160102	CLEARING AND GRUBBING (LS)	LS	LUMP SUM
54	190101	ROADWAY EXCAVATION	CY	39,200
55	190105	ROADWAY EXCAVATION (TYPE Z-2) (AERIALY DEPOSITED LEAD)	CY	5,350
56 (F)	192008	STRUCTURE EXCAVATION (TYPE A)	CY	3,510
57 (F)	192020	STRUCTURE EXCAVATION (TYPE D)	CY	8,208
58 (F)	193003	STRUCTURE BACKFILL (BRIDGE)	CY	1,151
59 (F)	044336	LIGHTWEIGHT EMBANKMENT (EPS BLOCK)	CY	8,574
60 (F)	044337	GEOMEMBRANE (GASOLINE RESISTANT)	SQYD	2,174

Item No.	Item Code	Item Description	Unit of Measure	Estimated Quantity
61 (F)	044338	STRUCTURE BACKFILL (LIGHTWEIGHT EMBANKMENT)	CY	1,054
62	200002	ROADSIDE CLEARING	LS	LUMP SUM
63	203070	ROCK STAIN	SQFT	10,800
64	025868	LIVE SILTATION	LF	53
65	025869	WILLOW CUTTINGS	EA	240
66	025870	WILLOW POLE	EA	220
67	204096	MAINTAIN EXISTING PLANTED AREAS	LS	LUMP SUM
68	204099	PLANT ESTABLISHMENT WORK	LS	LUMP SUM
69	206400	CHECK AND TEST EXISTING IRRIGATION FACILITIES	LS	LUMP SUM
70	206401	MAINTAIN EXISTING IRRIGATION FACILITIES	LS	LUMP SUM
71	206560	CONTROL AND NEUTRAL CONDUCTORS	LS	LUMP SUM
72	206604	1 1/2" ELECTRIC REMOTE CONTROL VALVE	EA	2
73	206605	2" ELECTRIC REMOTE CONTROL VALVE	EA	2
74 (F)	025871	TEMPORARY IRRIGATION LINE	LF	720
75	208482	SPRINKLER (TYPE C-2)	EA	160
76	208588	3" GATE VALVE	EA	6
77 (F)	208594	3/4" PLASTIC PIPE (SCHEDULE 40) (SUPPLY LINE)	LF	323
78 (F)	208595	1" PLASTIC PIPE (SCHEDULE 40) (SUPPLY LINE)	LF	160
79 (F)	208596	1 1/4" PLASTIC PIPE (SCHEDULE 40) (SUPPLY LINE)	LF	266
80 (F)	208597	1 1/2" PLASTIC PIPE (SCHEDULE 40) (SUPPLY LINE)	LF	23

Item No.	Item Code	Item Description	Unit of Measure	Estimated Quantity
81 (F)	208598	2" PLASTIC PIPE (SCHEDULE 40) (SUPPLY LINE)	LF	62
82 (F)	208600	3" PLASTIC PIPE (SCHEDULE 40) (SUPPLY LINE)	LF	2,710
83	208683	BALL VALVE	EA	3
84 (F)	208738	8" CORRUGATED HIGH DENSITY POLYETHYLENE PIPE CONDUIT	LF	30
85	208906	EXTEND 8" CONDUIT	LF	18
86	210010	MOVE-IN/MOVE-OUT (EROSION CONTROL)	EA	6
87	210110	IMPORTED TOPSOIL (CY)	CY	120
88	210270	ROLLED EROSION CONTROL PRODUCT (NETTING)	SQFT	87,200
89	210300	HYDROMULCH	SQFT	237,000
90	210350	FIBER ROLLS	LF	9,750
91	210420	STRAW	SQFT	130,000
92	025872	HYDROSEED (MIX A)	SQFT	47,000
93	025873	HYDROSEED (MIX B)	SQFT	150,000
94	025874	HYDROSEED (MIX C)	SQFT	40,300
95	025875	COMPOST (TYPE 1)	SQFT	150,000
96	025876	COMPOST (TYPE 2)	SQFT	47,000
97	210630	INCORPORATE MATERIALS	SQFT	47,000
98	250101	CLASS 1 AGGREGATE SUBBASE	CY	1,130
99	260203	CLASS 2 AGGREGATE BASE (CY)	CY	9,320
100	280000	LEAN CONCRETE BASE	CY	360

Item No.	Item Code	Item Description	Unit of Measure	Estimated Quantity
101	390132	HOT MIX ASPHALT (TYPE A)	TON	19,200
102	394053	SHOULDER RUMBLE STRIP (HMA,GROUND-IN INDENTATIONS)	STA	120
103	394073	PLACE HOT MIX ASPHALT DIKE (TYPE A)	LF	2,530
104	394074	PLACE HOT MIX ASPHALT DIKE (TYPE C)	LF	160
105	394076	PLACE HOT MIX ASPHALT DIKE (TYPE E)	LF	1,240
106	394077	PLACE HOT MIX ASPHALT DIKE (TYPE F)	LF	350
107	394090	PLACE HOT MIX ASPHALT (MISCELLANEOUS AREA)	SQYD	640
108	397005	TACK COAT	TON	19
109	490550	FURNISH 24" STEEL PIPE PILING	LF	4,208
110	490555	DRIVE 24" STEEL PIPE PILE	EA	88
111	490782	FURNISH PILING (CLASS 200) (ALTERNATIVE W)	LF	4,036
112	490783	DRIVE PILE (CLASS 200) (ALTERNATIVE W)	EA	68
113	498052	60" CAST-IN-DRILLED-HOLE CONCRETE PILE (SIGN FOUNDATION)	LF	22
114	510000	SEAL COURSE CONCRETE	CY	629
115 (F)	510051	STRUCTURAL CONCRETE, BRIDGE FOOTING	CY	299
116 (F)	510053	STRUCTURAL CONCRETE, BRIDGE	CY	3,058
117 (F)	510085	STRUCTURAL CONCRETE, APPROACH SLAB (TYPE EQ)	CY	35
118 (F)	510086	STRUCTURAL CONCRETE, APPROACH SLAB (TYPE N)	CY	487
119 (F)	510502	MINOR CONCRETE (MINOR STRUCTURE)	CY	116
120 (F)	518201	MASONRY BLOCK WALL	SQFT	96

Item No.	Item Code	Item Description	Unit of Measure	Estimated Quantity
121	519081	JOINT SEAL (MR 1/2")	LF	943
122 (F)	520102	BAR REINFORCING STEEL (BRIDGE)	LB	614,467
123 (F)	520120	HEADED BAR REINFORCEMENT	EA	4,530
124 (F)	560218	FURNISH SIGN STRUCTURE (TRUSS)	LB	16,215
125 (F)	560219	INSTALL SIGN STRUCTURE (TRUSS)	LB	16,215
126	560244	FURNISH LAMINATED PANEL SIGN (1"-TYPE A)	SQFT	260
127	568016	INSTALL SIGN PANEL ON EXISTING FRAME	SQFT	260
128	620140	24" ALTERNATIVE PIPE CULVERT	LF	360
129	623000	TEMPORARY CULVERT	LF	660
130	641113	24" PLASTIC PIPE	LF	530
131	650511	18" REINFORCED CONCRETE PIPE (CLASS V)	LF	130
132	650516	24" REINFORCED CONCRETE PIPE (CLASS V)	LF	1,620
133	025877	TEMPORARY SLOTTED CORRUGATED STEEL PIPE	LF	2,410
134	044339	STRUCTURE APPROACH DRAINAGE SYSTEM	LS	LUMP SUM
135	680287	3" SLOTTED PLASTIC PIPE UNDERDRAIN	LF	740
136	681104	4" PLASTIC PIPE (EDGE DRAIN)	LF	2,530
137	681112	4" PLASTIC PIPE (EDGE DRAIN OUTLET)	LF	470
138	682042	CLASS 2 PERMEABLE MATERIAL (BLANKET)	CY	47
139	025878	TEMPORARY DRAINAGE INLET	EA	11
140	700617	DRAINAGE INLET MARKER	EA	2

Item No.	Item Code	Item Description	Unit of Measure	Estimated Quantity
141	044340	6" WELDED STEEL PIPE CASING (BRIDGE) (.250" THICK)	LF	47
142	025879	TEMPORARY FLARED END SECTION	EA	1
143	705315	24" ALTERNATIVE FLARED END SECTION	EA	3
144	025880	TEMPORARY CAP INLET	EA	4
145	707117	36" PRECAST CONCRETE PIPE INLET	LF	3.1
146	709522	INLET DEPRESSION	EA	26
147	720121	ROCK SLOPE PROTECTION (1/2 T, METHOD A) (CY)	CY	2,400
148	721026	ROCK SLOPE PROTECTION (NO. 1, METHOD B) (CY)	CY	1,550
149 (F)	722020	GABION	CY	291
150	729011	ROCK SLOPE PROTECTION FABRIC (CLASS 8)	SQYD	3,090
151	731502	MINOR CONCRETE (MISCELLANEOUS CONSTRUCTION)	CY	920
152	731507	MINOR CONCRETE (GUTTER DEPRESSION)	CY	6.4
153	731508	MINOR CONCRETE (EXPOSED AGGREGATE CONCRETE)	SQFT	6,650
154 (F)	750001	MISCELLANEOUS IRON AND STEEL	LB	9,390
155	025881	WATER LINE (GOLETA WATER DISTRICT)	LS	LUMP SUM
156	025882	SEWER LINE (GOLETA SANITARY DISTRICT)	LS	LUMP SUM
157	800103	TEMPORARY FENCE (TYPE CL-6)	LF	360
158	025883	TEMPORARY FENCE (TYPE CL-6, SLATTED)	LF	28
159	800360	CHAIN LINK FENCE (TYPE CL-6)	LF	310
160	025884	WOOD FENCE	LF	16

Item No.	Item Code	Item Description	Unit of Measure	Estimated Quantity
161	802501	4' CHAIN LINK GATE (TYPE CL-6)	EA	1
162	802540	8' CHAIN LINK GATE (TYPE CL-6)	EA	2
163	802620	16' CHAIN LINK GATE (TYPE CL-6)	EA	1
164	025885	CHAIN LINK FENCE (TYPE CL-8, SLATTED, MODIFIED)	LF	1,980
165	025886	4' CHAIN LINK GATE (TYPE CL-8, SLATTED, MODIFIED)	EA	5
166	832002	METAL BEAM GUARD RAILING (STEEL POST)	LF	1,140
167	832070	VEGETATION CONTROL (MINOR CONCRETE)	SQYD	1,680
168 (F)	833032	CHAIN LINK RAILING (TYPE 7)	LF	50
169	839312	DOUBLE THRIE BEAM BARRIER (STEEL POST)	LF	2,180
170	839541	TRANSITION RAILING (TYPE WB)	EA	3
171	839542	TRANSITION RAILING (TYPE DTB)	EA	3
172	839581	END ANCHOR ASSEMBLY (TYPE SFT)	EA	2
173	839585	ALTERNATIVE FLARED TERMINAL SYSTEM	EA	3
174	839702	CONCRETE BARRIER (TYPE 60A)	LF	154
175	025887	CONCRETE BARRIER (TYPE 60R MODIFIED)	LF	200
176 (F)	839714	CONCRETE BARRIER (TYPE 80)	LF	208
177	025888	CONCRETE BARRIER (TYPE 60 MODIFIED)	LF	1,480
178	044431	CALIFORNIA ST-40 BRIDGE RAIL (MOD)	LF	47
179	840515	THERMOPLASTIC PAVEMENT MARKING	SQFT	860
180	840560	THERMOPLASTIC TRAFFIC STRIPE (SPRAYABLE)	LF	40,600

Item No.	Item Code	Item Description	Unit of Measure	Estimated Quantity
181	850101	PAVEMENT MARKER (NON-REFLECTIVE)	EA	580
182	850111	PAVEMENT MARKER (RETROREFLECTIVE)	EA	880
183	860090	MAINTAINING EXISTING TRAFFIC MANAGEMENT SYSTEM ELEMENTS DURING CONSTRUCTION	LS	LUMP SUM
184	025889	MODIFY WIRELESS VEHICLE DETECTION SYSTEM	LS	LUMP SUM
185	861502	MODIFY SIGNAL	LS	LUMP SUM
186	861504	MODIFY LIGHTING AND SIGN ILLUMINATION	LS	LUMP SUM
187	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
025865	REMOVE MASONRY BLOCK WALL	15
025866	REMOVE SINGLE THRIE BEAM BARRIER	15
025867	REMOVE DOUBLE THRIE BEAM BARRIER	15
044336	LIGHTWEIGHT EMBANKMENT (EPS BLOCK)	19
044337	GEOMEMBRANE (GASOLINE RESISTANT)	19
044338	STRUCTURE BACKFILL (LIGHTWEIGHT EMBANKMENT)	19
025868	LIVE SILTATION	20
025869	WILLOW CUTTINGS	20
025870	WILLOW POLE	20
025871	TEMPORARY IRRIGATION LINE	20
025872	HYDROSEED (MIX A)	21
025873	HYDROSEED (MIX B)	21
025874	HYDROSEED (MIX C)	21
025875	COMPOST (TYPE 1)	21
025876	COMPOST (TYPE 2)	21
025877	TEMPORARY SLOTTED CORRUGATED STEEL PIPE	66
044339	STRUCTURE APPROACH DRAINAGE SYSTEM	68
025878	TEMPORARY DRAINAGE INLET	70
044340	6" WELDED STEEL PIPE CASING (BRIDGE) (.250" THICK)	70
025879	TEMPORARY FLARED END SECTION	70
025880	TEMPORARY CAP INLET	70
025881	WATER LINE (GOLETA WATER DISTRICT)	77
025882	SEWER LINE (GOLETA SANITARY DISTRICT)	77
025883	TEMPORARY FENCE (TYPE CL-6, SLATTED)	80
025884	WOOD FENCE	80
025885	CHAIN LINK FENCE (TYPE CL-8, SLATTED, MODIFIED)	80
025886	4' CHAIN LINK GATE (TYPE CL-8, SLATTED, MODIFIED)	80
025887	CONCRETE BARRIER (TYPE 60R MODIFIED)	83
025888	CONCRETE BARRIER (TYPE 60 MODIFIED)	83
044341	CALIFORNIA ST-40 BRIDGE RAIL (MOD)	83
025889	MODIFY WIRELESS VEHICLE DETECTION SYSTEM	86

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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>	<ol style="list-style-type: none"> 1. RWQCB- 401 permit - Certification Number 34212WQ05 2. Department of Fish and Game 1602 Notification No.1600-2012-0155-R5 3. US Army Corp of Engineer 404 Permit No. SPL-2011-00782-TS, dated 12/13/12 4. Aerially deposited Lead Concentration Data and Sample Location map 5. Foundation Report for San Pedro creek culvert replacement (Br. No. 51-0341, EA 05-0G0701) dated June 6, 2012 6. Foundation Report for Las Vegas creek culvert replacement (Br. No. 51-0339, EA 05-0G0701) dated August 22, 2012 7. Foundation Report for Fairview Off-ramp culvert replacement (Br. No. 51-0339K, EA 05-0G0701) dated August 23, 2012 8. Revised Final Hydraulics Report for San Pedro and Las Vegas Creeks (EA 05-0G0701) dated December 7, 2011 9. Alternative Flared Terminal Systems
Available as specified in the <i>Standard Specifications</i>	<p>Cross sections</p> <ol style="list-style-type: none"> 1. Cross Sections in a PDF and 2D DGN file format. 2. Original ground data in a 2D DGN format. 3. Horizontal geometric alignment files in a XML format. 4. Vertical geometric alignment files in a XML format. <p>Bridge as-built drawings</p>

5 CONTROL OF WORK

Add to section 5-1.09A:

The Department encourages the project team to exhaust the use of partnering in dispute resolution before engagement of an objective third party.

For certain disputes, a facilitated partnering session or facilitated dispute resolution session may be appropriate and effective in clarifying issues and resolving all or part of a dispute.

To afford the project team enough time to plan and hold the session, a maximum of 20 days may be added to the DRB referral time following the Engineer's response to a *Supplemental Potential Claim Record*.

To allow this additional referral time, the project team must document its agreement and intention in the dispute resolution plan of the partnering charter. The team may further document agreement of any associated criteria to be met for use of the additional referral time.

If the session is not held, the DRB referral time remains in effect as specified in section 5-1.43.

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:

If the submittals for Contractor-supplied biologist and biological resource information program are authorized, you may enter the job site only to measure controlling field dimensions and locating utilities.

Do not start other job site activities until all the submittals from the above list are authorized or accepted and the following information is received by the Engineer:

1. *Notice of Materials To Be Used.*
2. Contingency plan for reopening closures to public traffic.
3. Written statement from the vendor that the order for the sign panels has been received and accepted by the vendor. The statement must show the dates that the materials will be shipped.
4. Written statement from the vendor that the order for electrical material has been received and accepted by the vendor. The statement must show the dates that the materials will be shipped.
5. Written statement from the vendor that the order for structural steel has been received and accepted by the vendor. The statement must show the dates that the materials will be shipped.

You may start job site activities before the 55th day after Contract approval if you:

1. Obtain specified authorization or acceptance for each submittal before the 55th day
2. Receive authorization to start

Submit a notice 72 hours before starting job site activities. If the project has more than 1 location of work, submit a separate notice for each location.

Replace section 8-1.09 with:

8-1.09 INCENTIVE/DISINCENTIVE FOR EARLY COMPLETION

The Department pays you the incentive for each day you complete the corresponding work part earlier than the date shown in the following table except as specified for the maximum total incentive and deducts the disincentive for each day you complete the corresponding work part beyond the date shown in the following table except as specified for the maximum total disincentive;

Incentive/Disincentive for Work Part Completion by Specified Dates

Work part	Date	Incentive amount	Disincentive amount
Stage 1-Phase 4 work that requires Ramp Closure(s) and use of detour alignments	January 10th	\$16,000	\$16,000
Stage 2-Phase 3 work that requires Ramp Closure(s) and use of detour alignments	January 10th	\$16,000	\$16,000

The Department pays a maximum total incentive of \$320,000.

The Department deducts a maximum total disincentive of \$320,000.

These incentives and disincentives are independent of liquidated damages and other damages specified.

At your request, the Department may accelerate its inspection and testing. The Department deducts any additional expenses incurred as a result of the acceleration.

The time limit specified for the completion of the work is considered insufficient to permit completion of the work by working a normal number of hours per day or week on a single shift basis. Should you fail to maintain the progress of the work in conformance with "Progress Schedule (Critical Path Method)" of these special provisions, additional shifts will be required to the extent necessary to ensure that the progress conforms to the above mentioned schedule and that the work will be completed within the time limit specified.

Actions required by the Engineer to perform normal inspection and testing duties will not be considered as contributing to any delay in awarding incentives or to any delay that will require charging disincentives.

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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. Steel piling
2. Bar reinforcing steel
3. Headed bar reinforcement
4. California ST-40 bridge rail
5. Chain Link Railing
6. Geomembrane (Gasoline Resistant)
7. Welded steel pipe casing (Bridge)
8. Culvert Pipes and Appurtenances
9. Overside Drains and Appurtenances
10. Edge Drains Pipes and Appurtenances
11. Miscellaneous Drainage Facilities
12. Rock Slope Protection Fabric
13. Miscellaneous Iron and Steel
14. Fences and Gates
15. Thrie Beam Barriers
16. Metal Beam Guard Railing
17. Terminal Systems and Appurtenances
18. Pavement Markers
19. Temporary Irrigation Line
20. Plastic Pipe (Supply Line)
21. Control and Neutral Conductors

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DIVISION II GENERAL CONSTRUCTION
10 GENERAL

Add to section 10-1.02:

Do not place the uppermost layer of new pavement until all underlying conduits and loop detectors are installed.

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 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 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. Do not use treated base for the taper.

12-2.04 PAYMENT

Not Used

Add to section 12-3.12C:

Start displaying the message on the portable changeable message sign 5 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. Off-ramp closure
3. 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, ramp 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 freeway, ramps and local street where the useable shoulder width is less than 10 feet.

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, ramp closure, shoulder closure, or any 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 12-4.02A:

If work including installing, maintaining, and removing Type K temporary railing is to be performed within 6 feet of the adjacent traffic lane, close the adjacent traffic lane.

Except as listed above, closure of the adjacent traffic lane is not required for installing, maintaining, and removing traffic control devices.

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.

The maximum length of a single stationary lane closure is 1.0 miles.

Not more than 1 stationary lane closures will be allowed in each direction of travel at one time. Concurrent stationary closures must be spaced no closer than 1 miles apart.

Personal vehicles of your employees must not be parked within the right-of-way except between PM 22.3 and PM 23.0.

If work vehicles or equipment are parked within 6 feet of a traffic lane, close the shoulder area as shown.

A minimum of 1 paved traffic lane not less than 12 feet wide must be open for use by traffic in each direction of travel.

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 to section 12-4.03:

For each 10-minute interval or fraction thereof past the time specified to reopen the closure, the Department deducts the amount for damages per interval shown below. Damages are limited to 5 percent of the total bid per occurrence. Damages are not assessed if the Engineer orders the closure to remain in place beyond the scheduled pickup time.

Type of facility	Route or segment	Period	Damages/interval (\$)
Mainline	SB- Route 101	1st half hour 2nd half hour 2nd hour and beyond	\$1,850/ 10 minutes \$2,925 / 10 minutes \$3,900/ 10 minutes
Mainline	NB- Route 101	1st half hour 2nd half hour 2nd hour and beyond	\$1,450/ 10 minutes \$2,175 / 10 minutes \$2,900/ 10 minutes
Ramp	Fairview Ave SB ON- Ramp	1st hour and beyond	\$225/hour

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	H xx	xx	xx							
	SD xx									
x	xx	H xx	xx							
		SD xx								
	x	xx	H xx	xx						
			SD xx							
x	xx	xx	xx	H xx	xxx					
	x	xx	xx	SD xx	xxx					
				x	H xx					
				x	SD xx					
					x	H xx				
						SD xx				
					x	xx	H xx	xx	xx	xx
							SD xx			

Legend:

	Refer to lane requirement charts
x	The full width of the traveled way must be open for use by traffic after 12:00 pm.
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 8:00 am
H	Designated holiday
SD	Special day

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

Chart no. 1 Freeway Lane Requirements																										
County: Santa Barbara					Route/Direction: 101/NB										PM: 22.3/23.0											
Closure Limits: from .23 mi east of Fairview OC to .71 mi west of Los Carneros OC																										
From hour to hour		24	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Mondays through Thursdays		1	1	1	1	1	1	2														2	2	1	1	1
Fridays		1	1	1	1	1	1	2																		
Saturdays																										
Sundays																						1	1	1	1	

Legend:

1	Provide at least 1 through freeway lane open in direction of travel
2	Provide at least 2 adjacent through freeway lanes open in direction of travel
	Work allowed within the highway where shoulder or lane closure is not required

REMARKS:

Chart no. 2 Freeway Lane Requirements																										
County: Santa Barbara					Route/Direction: 101/SB										PM: 22.3/23.0											
Closure Limits: from .23 mi east of Fairview OC to .71 mi west of Los Carneros OC																										
From hour to hour		24	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Mondays through Thursdays		1	1	1	1	1	1	1														1	1	1	1	
Fridays		1	1	1	1	1	1	1																		
Saturdays																										
Sundays																						1	1	1	1	

Legend:

1	Provide at least 1 through freeway lane open in direction of travel
	Work allowed within the highway where shoulder or lane closure is not required

REMARKS:

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

Chart no. 3 Complete Ramp Closure Hours Requirements																										
County: Santa Barbara					Route/Direction: 101/ NB & SB										PM: 22.48											
Closure limits: Fairview Avenue southbound off-ramp and northbound on-ramp																										
From hour to hour																										
	24	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
Mondays through Thursdays	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Fridays	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Saturdays	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Sundays	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Legend:																										
<table border="1"> <tr> <td>C</td> <td>Ramp may be closed completely</td> </tr> </table>																									C	Ramp may be closed completely
C	Ramp may be closed completely																									
REMARKS:																										
<p>Detour required.</p> <p>The southbound off-ramp at Fairview cannot be closed 24/7 until the southbound off-ramp at Los Carneros (Permit No. 0511 NMC 0258) is completely open.</p> <p>Ramps must be open to traffic when construction activities are not actively in progress.</p> <p>All ramp opening(s) and closing(s) shall only be as described in the Stage Construction Sheets of the Project Plans.</p> <p>All exceptions regarding ramp closures shall be approved by the Engineer.</p>																										

**Chart no. 4
Complete Ramp Closure Hours Requirements**

County: Santa Barbara	Route/Direction: 101/ NB & SB	PM: 22.48																								
Closure limits: Fairview Avenue southbound on-ramp																										
From hour to hour	24	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
Mondays through Thursdays	C	C	C	C	C	C																			C	C
Fridays	C	C	C	C	C	C																				
Saturdays																										
Sundays																									C	C

Legend:

C Ramp may be closed completely

Work allowed within the highway where shoulder or lane closure is not required

REMARKS:

Detour required.

Ramps must be open to traffic when construction activities are not actively in progress.

Liquidated damages will be assessed for late re-opening of ramps.

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

Chart no. 5 Conventional Highway Lane Requirements																										
County: Santa Barbara						Route/Direction: Calle Real																				
Closure limits: Calle Real Between Carlo Drive and Valdez Avenue																										
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	1	1	1	1	1	1	1	1	1	1	1	1	1	R	R	R	R	R	
Fridays		R	R	R	R	R	R	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Saturdays		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Sundays		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Legend:																										
1		Provide at least 1 through traffic lane open in direction of travel																								
R		Provide at least 1 through traffic lane, not less than 10 feet in width, for use by both directions of travel (Reversing Control)																								
REMARKS: Must obtain concurrence from local jurisdiction for lane closures.																										

Replace section 12-5 with:

12-5 TRAFFIC CONTROL SYSTEM FOR LANE CLOSURE

12-5.01 GENERAL

Section 12-5 includes specifications for closing traffic lanes, ramps, or a combination, with stationary and moving lane closures on multilane highways and 2-lane, 2-way highways. The traffic control system for a lane closure or a ramp closure must comply with the details shown.

Traffic control system includes signs.

12-5.02 MATERIALS

Vehicles equipped with attenuators must comply with section 12-3.13 of the special provisions.

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

For multilane freeway or expressway lane closures, do not place the 2L tangent section shown along lane lines between the lane closure tapers.

For multilane freeways and expressways, do not place the traffic cones shown to be placed transversely across closed traffic lanes and shoulders.

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.

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

Temporary painted traffic stripes and painted pavement markings used for temporary delineation must comply with section 84-3.

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 temporary pavement markers on the Authorized Material List for short-term day/night use, 14 days or less, or long-term day/night use, 180 days or less. Place temporary pavement markers under the manufacturer's instructions.

12-8.02C Temporary Edge Line Delineation

On multilane roadways, freeways, and expressways open to traffic where edge lines are obliterated and temporary pavement delineation to replace those edge lines is not shown, provide temporary pavement delineation for:

1. Right edge lines consisting of (1) a solid 4-inch wide traffic stripe tape of the same color as the stripe being replaced, (2) traffic cones, or (3) portable delineators or channelizers placed longitudinally at intervals not exceeding 100 feet
2. Left edge lines 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, or (4) temporary pavement markers placed longitudinally at intervals not exceeding 6 feet

12-8.02D Temporary Traffic Stripe Tape

Not used

12-8.02E Temporary Traffic Stripe Paint

Not Used

12-8.02F Temporary Pavement Marking Tape

Not used

12-8.02G Temporary Pavement Marking Paint

You may use one of the types of temporary removable pavement marking tape or permanent pavement marking tape on the Authorized Material List instead of temporary pavement marking paint.

12- 8.02H Temporary Pavement Markers

Not used

12-8.03 CONSTRUCTION

12-8.03A General

Wherever 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 the 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 pattern of temporary pavement delineation or permanent pavement delineation.

When the Engineer determines the temporary pavement delineation is no longer required for the direction of traffic, remove the temporary pavement 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 and temporary pavement delineation to replace the lines is not shown, the minimum lane line and centerline delineation must consist of temporary pavement markers placed longitudinally at intervals not exceeding 24 feet. For temporary pavement markers on the Authorized Material List for long-term day/night use, 180 days or less, cement the markers to the surfacing with the adhesive recommended by the manufacturer except do not use epoxy adhesive to place the 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 on the Authorized Material List for short-term day/night use, 14 days or less, place the markers longitudinally at intervals not exceeding 24 feet. Do not use the markers for more than 14 days on lanes opened to traffic. Place the permanent pavement delineation before the end of the 14 days. 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 pattern specified or shown for the permanent pavement delineation for the area. The Department does not pay for the additional temporary pavement delineation.

12-8.03C Temporary Edge Line Delineation

You may apply temporary painted traffic stripe where removal of a 4-inch wide traffic stripe is not 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.

Take the management measures shown in the following table for the corresponding ESA shown. Any access to an ESA other than that shown is prohibited.

ESA Management

Identification	Location	Management measures
Archaeological ESA	Las Vegas Creek (Br # 51-339K) See L-2	No equipment, materials or vehicle staging or storage or any other ground distributing activities allowed in vacant lot adjacent to Calle Real and Las Vegas Creek. No ESA fence required or shown on plans

Replace section 14-6.02 with:

14-6.02 SPECIES PROTECTION

14-6.02A General

Section 14-6.02 includes specifications for protecting regulated species or their habitat.

This project is within or near habitat for regulated species shown in the following table:

Species Name
California red-legged frog
Steelhead
Southwestern Willow Flycatcher
Least Bell's Vireo
Southwestern Pond turtle
Two-Striped Garter snake
Swallows
Bats
Nesting birds

The Department anticipates nesting or attempted nesting by migratory and nongame birds from February 15 to September 15.

14-6.02B Material

Not Used

14-6.02C Construction

14-6.02C(1) General

Not Used

14-6.02C(2) Protective Radius

Upon discovery of a regulated species, stop construction activities within a 100 radius of the discovery or as defined in the table below. Immediately notify the Engineer. Do not resume activities until receiving notification from the Engineer.

Regulated species name	Protective radius
Breeding Passerine birds	150
Nesting raptors	300

14-6.02C(3) Protocols

Use protocols required by PLACs

14-6.02C(4) Biological Resource Information

Not Used

14-6.02C(5) Protection Measures

Within species protection area 1, implement the following protection measures:

1. Follow all protective measures outlined in PLACs.
2. An approved biologist will monitor all initial ground disturbing activities, all vegetation removal activities, all stream diversion system installation and removal activities, and all dewatering system installation and removal activities.
3. An approved biologist will sign and approve all stream diversion and dewatering plans prior to submittal to the Engineer
4. Prior to implementing any stream diversion or dewatering systems, an approved fisheries biologist shall survey affected waters for species that may become trapped or harmed. The biologist shall relocate the affected species to an appropriate nearby location outside the area to be impacted.
5. Swallows shall not be allowed to nest on any structures to be removed or modified. If allowed to nest on nearby structures, an approved biologist shall monitor the nesting behavior to ensure the project activities have no impact. If the contractor's activities are found to be affecting swallow nesting activity, the contractor's conflicting activity shall be immediately halted until an alternative method can be implemented to not affect the nesting behavior
6. All trees and structures will be surveyed for bats by a biologist prior to branch trimming, tree removal, demolition or maintenance to a structure.
7. If a bat is discovered it will be allowed to leave the area or structure on its own without further disturbance.
8. If a day roost is discovered, exclusion methods may be employed September 1 through March 1. Exclusion methods must ensure that no bats are harmed or trapped in the process and that a biologist is present during the installation process.
9. If a bat day roost is discovered, no exclusion methods shall be employed and no disturbance shall be allowed March through August.
10. An approved biologist shall survey the entire project area twice weekly. The biologist shall immediately halt any activity found to be in conflict with the terms of the PLACs and report the activity to the Engineer. All environmentally sensitive areas (ESAs) delineated on the plans shall be inspected to ensure ESA and exclusionary fencing is intact and no impacts have occurred inside the ESAs.
11. Concrete pouring shall be prohibited when a 70 percent or greater chance of rainfall is predicted within 72 hours.
12. Concrete poured after November 1st shall incorporate a quick curing methodology.
13. No staging or storage of equipment or materials is allowed within the banks of either stream. All equipment and materials shall be removed from the stream channels at the end of every work shift.
14. All equipment that will be stationary for more than 12 hours shall have catch or drip pans placed underneath them. All compressors, pumps and fuel tanks shall be placed inside fuel spill containment system.

14-6.02C(6) Monitoring Schedule

Monitor according to the following schedule:

Monitoring type	Schedule
Stream Diversion and Dewatering activities	Duration of all stream diversion and dewatering installation and removal activities
Vegetation trimming and removal	Duration of all vegetation trimming and removal activities
Initial ground disturbance	Duration of all initial ground disturbances
Entire project survey	Twice weekly

14-6.02D Payment

Not Used

Replace 3rd paragraph of section 14-6.03A with:

The Department anticipates nesting or attempted nesting by migratory and nongame birds from February 15 to September 15.

Replace section 14-6.05 with:

14-6.05 CONTRACTOR-SUPPLIED BIOLOGIST

14-6.05A General

14-6.05A(1) Summary

Section 14-6.05 includes specifications for providing a Contractor-supplied biologist to monitor construction and other activities to protect regulated species that may be harmed during construction activities.

14-6.05A(2) Submittals

14-6.05A(2)(a) Qualifications

Within 7 days after Contract approval, submit each biologist's name, resume, and statement of qualifications. Allow 7 days for review. If the submittal is incomplete, the Engineer will provide comments. Within 7 days after receiving the Engineer's comments, update and resubmit qualifications data. Do not start construction activities until the Contractor-supplied biologist is authorized.

14-6.05A(2)(b) Protocols

Within 5 days before beginning survey activities, submit protocols for species protection surveys for acceptance.

14-6.05A(2)(c) Pre-Construction Survey Report

Submit a pre-construction survey report within 35 days before starting construction activities.

14-6.05A(2)(d) Initial Monitoring Report

Submit an Initial Monitoring Report that includes, at a minimum, the requirements for Monitoring Report submittals within 12 hours after starting ground-disturbing activities.

14-6.05A(2)(e) Monitoring Report

Submit a Monitoring Report every 5 working days during the monitoring period.

Submit Monitoring Reports according to the schedule in the Natural Resources Protection Plan.

14-6.05A(2)(f) Incident Report

Submit an Incident Report within 24 hours of the incident.

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

Not used

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

Submit no later than 30 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.

Biologists who perform specialized activities must have demonstrated field experience working with the species or performing the specialized task. Biologists who perform specialized activities must meet the following minimum requirements:

Specialized activity/species	Requirements
Southwestern pond turtle	DFG Scientific Collecting permit to capture and relocate
Two striped garter snake	DFG Scientific Collecting permit to capture and relocate
Nesting bird surveys	DFG approval
Bats	DFG approval

14-6.05A(3)(b) Protocols

Not used

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 35 days before starting construction activities.

14-6.05C(3) Protective Radius

Not used

14-6.05C(4) Monitoring Schedule

Not used

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 be typed and 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 will be generated when a sensitive species is observed or when take occurs and includes:

1. Description of any sensitive species observation or take incident
2. Date, time, and location of each incident using GPS technology, and circumstances of each incident.
3. Species name, number of species taken and the general condition and health of each individual species observed, diagnostic markings, sex, age, and habitat description.
4. Details of required notifications with contact information
5. Corrective actions proposed or taken
6. Disposition of taken species with contact information of persons in possession of species
7. Names of those witnessed to incident with contact information

The Weekly Monitoring Report includes:

1. List of all animal species observed
2. Assessment of compliance with all mitigation and avoidance measures and suggestions for remedy if found non-compliant
3. Compilation and summary from the daily monitoring reports for calendar week.
4. Current construction schedule of the project

Monthly Monitoring Report includes:

1. Compilation and summary from the weekly monitoring reports for calendar month.

The Annual Monitoring Report includes:

1. Construction beginning and ending dates and current construction schedule of the project
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 14-6.06 with:

14-6.06 SPECIES PROTECTION AREA

14-6.06A General

14-6.06A(1) Summary

Section 14-6.06 includes specifications for areas that have species protection requirements.

Species protection areas (SPAs) within the project limits are shown:

Species Protection Areas	
Identification	Location
SPA 1	Entire project limits

14-6.06B Materials

Not Used

14-6.06C Construction

Not Used

14-6.06D 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 and section 14-6.08.

14-6.07A(2) Submittals

Submit the natural resource protection plan within 7 days after Contract approval. Allow 7 days for the Engineer's review. If the submittal is incomplete, the Engineer will provide comments. Within 7 days after receiving the Engineer's comments, update and resubmit the natural resource protection plan.

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 addressed in the plan, including the species listed in "Species Protection"
3. List of habitats addressed in the plan, including jurisdictional drainages addressed in PLAC's.
4. Detailed description of proposed survey methods for all species and habitats addressed in the plan, including monitoring of all dewatering, diversion or crossings operations in jurisdictional drainages. Protection and minimization measures that include those required by PLAC's and outlined in "Species Protection" Protective radii for regulated species encounters
6. Implementation plan for protection measures, including monitoring schedule.
7. Monitoring duties
8. Justification for each instance where protection measures and an implementation plan are not necessary for a regulated species

9. Schedule for inspecting and maintaining protection measures, at a minimum of twice per calendar week. Monitoring must be conducted onsite during all construction activities that have the potential to impact regulated or sensitive species or habitats, including jurisdictional drainages. Schedule for submittal of monitoring reports. Weekly reports will be submitted by the end of each calendar week and monthly reports by the 5th of every month. Response plan for instances where regulated species are encountered
11. Content of the Biological Resource Information Program and location of the
12. Location and schedule of Environmentally Sensitive Area (ESA) fence installation and removal, with identification of species or habitats to be protected by each ESA and Biological Monitoring Area (BMA)
13. Implementation plan for monitoring and maintaining the integrity of all Environmentally Sensitive Area (ESA) fencing as delineated on design plans

14-6.07B Materials

Not Used

14-6.07C Construction

Not Used

14-6.07D Payment

Not Used

Replace section 14-6.08 with:

14-6.08 BIOLOGICAL RESOURCE INFORMATION PROGRAM

14-6.08A General

14-6.08A(1) Summary

Section 14-6.08 includes specifications for preparing and presenting a Biological Resource Information Program to familiarize construction staff with regulated species and related requirements.

A Contractor-supplied biologist must prepare and present training to personnel as required in PLACs, regarding regulated species, related laws and regulations, and protection measures.

14-6.08A(2) Submittals

Within 7 days after Contract approval, submit an outline of the Biological Resource Information Program. Allow 7 days for the Engineer's review. If the submittal is incomplete, the Engineer will provide comments. Within 7 days after receiving the Engineer's comments, update and resubmit the outline.

Notify the Engineer of scheduled training classes at least 7 days before the 1st training class.

Provide the Engineer with an attendance list including the printed and signed name of each attendee of the Biological Resource Information Program. Provide the Engineer with the attendance list within 2 working days following each environmental education session. Submit a separate attendance list for each subsequent session for new workers.

14-6.08B Materials

Not Used

14-6.08C Construction

Workers must receive Biological Resource Information training before performing on-site work. Workers include laborers, tradesmen, material suppliers, equipment maintenance personnel, supervisors, foremen, office personnel, food vendors, and other personnel who stay on the project longer than 120 minutes.

The Biological Resource Information Program includes:

1. Description of regulated species that may be affected by construction
2. Requirements for the protection of regulated species
3. Definition and consequences of "take"

4. What to do when you see a regulated species or a species that looks like a regulated species
5. Permit requirements to touch or move a regulated species
6. Identification of work areas, staging and stockpile areas and ESA
7. Species Protection Area (SPA) requirements
8. Description of avoidance and minimization measures
9. Natural Resources Protection Plan or PLAC requirements
10. Representative photos and description and general ecology of the regulated species
11. Description of specific habitats used by the regulated species and their location
12. Handout to implement species protection measures that describe species, habitats, and actions as listed in section 14-6.02 or in PLACs

Provide a handout to implement species protection measures that describes species, habitats, and actions as listed in species protection or in PLACs. Display and maintain the handout at all construction field offices and on all information boards.

14-6.08D Payment

Not Used

Replace section 14-11.03 with:

14-11.03 MATERIAL CONTAINING HAZARDOUS WASTE CONCENTRATIONS OF AERIALLY DEPOSITED LEAD

14-11.03A General

14-11.03A(1) Summary

Section 14-11.03 includes specifications for hazardous waste management while excavating, stockpiling, transporting, placing, and disposing of material containing hazardous waste concentrations of aerially deposited lead (ADL).

ADL is present within the project limits.

14-11.03A(2) Definitions

Type Z-2: Material that contains ADL in average concentrations (using the 95 percent Upper Confidence Limit) greater than or equal to 1,000 mg/kg total lead, greater than or equal to 5.0 mg/L soluble lead (as tested using the California Waste Extraction Test), and the material is surplus; or material that contains ADL in average concentrations greater than 150 mg/L extractable lead (based on a modified waste extraction test using deionized water as the extractant) or greater than 3,397 mg/kg total lead. This material is a Department-generated California hazardous waste and must be transported to and disposed of at a California Class I disposal site.

14-11.03A(3) Site Conditions

ADL concentration data and sample locations maps are included in the *Information Handout*.

Type Z-2 material exists as shown on the plans.

14-11.03A(4) Submittals

14-11.03A(4)(a) Lead Compliance Plan

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

14-11.03A(4)(b) Excavation and Transportation Plan

Within 15 days after approval of the Contract, submit 3 copies of an excavation and transportation plan. Allow 7 days for review. If revisions are required, as determined by the Engineer, submit the revised plan within 7 days of receipt of the Engineer's comments. For the revision, allow 7 days for the review. Minor changes to or clarifications of the initial submittal may be made and attached as amendments to the excavation and transportation plan. In order to allow construction to proceed, the Engineer may conditionally approve the plan while minor revisions or amendments are being completed.

Prepare the written, project specific excavation and transportation plan establishing the procedures you will use to comply with requirements for excavating, stockpiling, transporting, and placing or disposing of

material containing ADL. The plan must comply with the regulations of the DTSC and Cal/OSHA . The sampling and analysis portions of the excavation and transportation plan must meet the requirements for the design and development of the sampling plan, statistical analysis, and reporting of test results contained in US EPA, SW 846, "Test Methods for Evaluating Solid Waste," Volume II: Field Manual Physical/Chemical, Chapter Nine, Section 9.1. The plan must include the following elements:

1. Excavation schedule by location and date
2. Temporary locations of stockpiled material
3. Sampling and analysis plans for areas after removal of a stockpile. Include the following:
 - 3.1. Location and number of samples
 - 3.2. Name and address of the CDPH Environmental Laboratory Accreditation Program (ELAP) certified laboratory where the analysis was performed
4. Dust control measures
5. Transportation equipment and routes
6. Method for preventing spills and tracking material onto public roads
7. Truck waiting and staging areas
8. Site for disposal of hazardous waste

14-11.03A(4)(c) Burial Location Report

Not Used

14-11.03A(4)(d) Bill of Lading

14-11.03A(5) Quality Control and Assurance

Excavation, reuse, and disposal of material with ADL must comply with rules and regulations of the following agencies:

1. US DOT
2. US EPA
3. California Environmental Protection Agency
4. CDPH
5. DTSC
6. Cal/OSHA
7. California Department of Resources Recycling and Recovery
8. RWQCB, Region 3, Central Coast
9. State Air Resources Control Board
10. Santa Barbara County Air Pollution Control District

Transport and dispose of material containing hazardous levels of lead under federal and state laws and regulations and county and municipal ordinances and regulations. Laws and regulations that govern this work include:

1. Health & Safety Code, Division 20, Chp 6.5 (California Hazardous Waste Control Act)
2. 22 CA Code of Regs, Div. 4.5 (Environmental Health Standards for the Management of Hazardous Waste)
3. 8 CA Code of Regs

14-11.03B Materials

Not Used

14-11.03C Construction

14-11.03C(1) General

Not Used

14-11.03C(2) Material Management

Transport excavated Type Z-2 material using:

1. Hazardous waste manifest
2. Hazardous waste transporter with a current DTSC registration certificate and CA Highway Patrol (CHP) Biennial Inspection of Terminals (BIT) Program compliance documentation.

14-11.03C(3) Dust Control

Excavation, transportation, placement, and handling of material containing ADL must result in no visible dust migration. A water truck or tank must be on the job site at all times while clearing and grubbing or performing earthwork operations in work areas containing ADL. Apply water to prevent visible dust.

14-11.03C(4) Surveying Type Y-1 or Y-2 Material Burial Locations

Not Used

14-11.03C(5) Material Transportation

Before traveling on public roads, remove loose and extraneous material from surfaces outside the cargo areas of the transporting vehicles and cover the cargo with tarpaulins or other cover, as outlined in the approved excavation and transportation plan. You are responsible for costs due to spillage of material containing lead during transport. .

14-11.03C(6) Disposal

Analyze surplus material for which the lead content is not known for lead before removing the material from within the project limits. Submit a sampling and analysis plan and the name of the analytical laboratory at least 15 days before beginning sampling and analysis. Use a CDPH ELAP certified laboratory. Sample at a minimum rate of 1 sample for each 200 cu yd of surplus material and test for lead using US EPA Method 6010B or 7000 series.

14-11.03D Payment

Payment for a lead compliance plan is not included in the payment for environmental stewardship work.

The Department does not pay for stockpiling of material containing ADL, unless the stockpiling is ordered. The Department does not pay for sampling and analysis unless it is ordered. The Department does not pay for additional sampling and analysis required by the receiving landfill.

Sampling, analyses, and reporting of results for surplus material not previously sampled is change order work.

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 thrie beam barrier are 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

Not Used

14-11.09C(2) Training

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

1. 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 lb or more of TWW, request a generator's EPA Identification Number at least 5 business days before the 1st 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. Generator's EPA Identification Number for projects with 10,000 lb or more of TWW

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>

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.

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 15-2.02I with:

15-2.02I Remove Sign Structures

Removing overhead sign structures includes removal of:

1. Frames, braces, supports, and brackets
2. Portions of foundations
3. Sign panels
4. Mounting hardware for light fixtures
5. Walkways, safety railing, gutter
6. Electrical equipment for sign lighting
7. Hardware
8. Posts
9. Portions of foundations

Concrete foundations may be abandoned in place except that the top portion, including anchor bolts, reinforcing steel, and conduits, must be removed to a depth of not less than 8'-3" below the adjacent finished grade. The resulting holes must be backfilled and compacted with material that is equivalent to the surrounding material.

Remove signs' conduit and wiring to the nearest pull box. Remove fuses within spliced connections in the pull box.

Replace section 15-2.02M with:

15-2.02M Remove Single Thrie Beam Barrier

When removing single thrie beam barrier, remove all elements including any concrete anchors and steel foundation tubes

Add to section 19:

19-11 LIGHTWEIGHT EMBANKMENT (EPS BLOCK)

19-11.01 GENERAL

19-11.01A Summary

Section 19-11 includes specifications for constructing lightweight embankment (EPS block).

Lightweight embankment (EPS block) must be expanded polystyrene (EPS) material.

Fabricate lightweight embankment (EPS block) as blocks measuring approximately 2 ft x 4 ft x 8 ft. Manufacturer's standard size blocks are acceptable. Special sized blocks are required at the edges of the lightweight embankment section to fill the volume as shown.

Sand bags must comply with section 19-3.02E(2).

Temporary geomembrane must comply with section 19-11

19-11.01B Submittals

Submit the following:

1. Shop drawings showing special size blocks and the layout of lightweight embankment (EPS block) blocks in each layer.
2. Certificate of compliance for Lightweight embankment (EPS block).

19-11.02 MATERIALS

Properties of Lightweight fill (EPS block) are shown in the following table:

Physical Property	ASTM Designation	Acceptance Value
Density	C 303	1.5 lb/ft ³ Minimum 2 lb/ft ³ Maximum
Compressive Strength (at 1% deformation)	D 1621	10.9 psi Minimum
Flexural Strength	C 203	45 psi Minimum
Tensile Strength	D 1623	20 psi Minimum
Water Absorption	C 272	2.0% Maximum by Volume

19-11.03 CONSTRUCTION

The long axis of blocks in adjacent layers must be rotated horizontally 90 degrees and the edges of blocks in adjacent layers must be offset as shown to minimize continuous joints.

Prevent damage to the lightweight embankment (EPS block) during delivery, storage, and construction. Protect lightweight embankment (EPS block) from petroleum products, ultraviolet light, and mechanical damage. Any lightweight embankment (EPS block) damaged by your equipment or operations must be replaced by you at your expense. It is your responsibility to ensure that the EPS blocks are not exposed to hydrocarbons contamination during the life of the contract.

Between stages, as shown, the lightweight embankment (EPS block) must be protected with temporary geomembrane (Type A-gasoline resistant) and weighted down with sufficient sand bags to keep it in place. The sacks for sand bags must be made of at least 10 ounce burlap or an equivalent strength woven geotextile. The size of the sack is approximately 18 inches by 36 inches measured inside the seams when the sack is laid flat. The capacity of each sack must be approximately 0.05 cubic yards. Fill the sacks with approximately 0.04 cubic yards of sand loosely placed so as to leave room for folding at the top. The fold must be just enough to retain the sand at the time of placing.

Place lightweight embankment (EPS block) to the lines and grades shown and as directed by the Engineer. Surfaces to receive lightweight embankment (EPS block) must be finished such that there is no more than a 5/8 inch variation in vertical grade over any 10 ft interval, and are within 2.5 inches of the grade shown. The surface of a layer of lightweight embankment (EPS block) blocks on which additional blocks are to be placed must be plane, with no more than a 5/8 inch variation in vertical grade over any 10 ft interval. All blocks must fit accurately against adjacent blocks, without voids wider than 5/8 inch at any vertical joint. Construct the finished surface of the lightweight embankment (EPS block) to a tolerance of plus or minus 4 inches from the grade shown. Lightweight embankment (EPS block) must not be less than 6 inches in thickness. This may require saw cutting the lower blocks to achieve a minimum 6 inch thickness for the top most EPS blocks in order to meet roadway superelevations and grades. Contain, collect and haul offsite for disposal all excess EPS block cuttings and debris resulting from saw cutting and other construction related activity.

Sliding of lightweight embankment (EPS block) blocks along horizontal joints must be prevented by timber fasteners placed as shown or by gluing. Timber fasteners must have 16 prongs approximately 1 inch on-center which penetrate a minimum of 1/2 inch into the foam block above and below or as approved by the Engineer. Timber fasteners must be placed a minimum of 9 inches from block edges. Glue must be as recommended by the manufacturer of the lightweight embankment (EPS block). Glue joints must be capable of developing a minimum of 12.3 psi of shear strength when tested in accordance with ASTM D 732 test procedures.

19-11.04 PAYMENT

Not Used

Add to section 19:

19-12 GEOMEMBRANE (GASOLINE RESISTANT)

19-12.01 GENERAL

19-12.01A Summary

Section 19-12 includes specifications for placing geomembrane (gasoline resistant).

The geomembrane must be suitable for the containment of spilled liquid hydrocarbons, including gasoline, diesel fuel, kerosene, hydraulic fluid, methanol, ethanol, mineral spirits, and naphtha.

The geomembrane must be sufficiently flexible to cover and closely conform to 90 degree edges and corners of lightweight embankment (EPS block) subgrade material at ambient temperatures as low as 45°F without application of heat.

19-12.01B Submittals

Submit a certificate of compliance for geomembrane (gasoline resistant).

19-12.02 MATERIALS

Geomembrane (gasoline resistant) must consist of reinforced or unreinforced tri-polymer membrane consisting of polyvinyl chloride (PVC), ethylene interpolymer alloy, and polyurethane or a comparable polymer combination.

Properties of Geomembrane (gasoline resistant) are shown in the following table:

Physical Property	ASTM Designation	Acceptance Value
Unleaded Gasoline Vapor transmission rate	D 814	0.025 lb/sqft Maximum per 24 hours
Thickness	D 751 *	0.028 inch Minimum
Breaking strength (Grab Test Method) (1 inch grip, 4 x 8 inch test specimen)	D 751 *	600 lbs Minimum in each direction
Tensile Strength	D 1623	19 psi Minimum
Elongation at break	D 4632 *	20 Percent Minimum
Toughness (Percent elongation times Breaking strength **)	N/A	7.2 ton Minimum
Puncture Resistance (ball tip)	D 751 ***	800 lbs Minimum
Low Temperature Resistance (1 inch mandrel, 4 hours)	D 2136 *	Pass at -30°F

* or ASTM test method appropriate for specific polymer

** for example, 3 ton x 30% = 90 ton

*** or FTMS 101C, Method 2065

All factory-produced seams must have a minimum bonded width of 1-1/8 inches, and must have a minimum shear strength of 320 lbs when tested in accordance with ASTM D 751 (Modified per NSF Standard No. 54). Failure must occur in the base geomembrane material.

19-12.03 CONSTRUCTION

Place Geomembrane (gasoline resistant) directly on the surface of the lightweight embankment (EPS block), which must be clean and free of sharp objects.

Field seams must be bonded with an electrically-heated hot-wedge device as recommended by the manufacturer. Do not use hot air extrusion welding devices or solvent bonding chemicals. The temperature of the bonded geomembrane must not exceed 165°F immediately before contacting the lightweight embankment (EPS block).

Before installation of geomembrane, you must demonstrate to the Engineer that the equipment, techniques, and personnel proposed for the bonding of field seams can produce vapor-tight seams under similar weather and work conditions near the job site. Field seams must be inspected. When ordered by the Engineer, field seams must be tested in accordance with ASTM D 4437 (Vacuum Box Testing) and pass.

Do not operate construction equipment directly on the geomembrane. Any material damaged by your equipment or operations must be replaced or repaired to the satisfaction of the Engineer by you at your expense.

- 1.2 In the median planter.
- 1.3 Before they reach the seed stage of growth or exceed 4 inches in length, whichever occurs 1st.
- 1.4 Dispose of the same day they are pulled.
- 2. Mow weeds and grasses:
 - 2.1 From the edge of plant basins out to the limits of maintain existing planted areas.
 - 2.2 Before they reach the seed stage of growth or exceed 6 inches in length.
 - 2.3 To a height of 2 to 6 inches.
- 3. Weeds and grasses may be killed, instead of mowed, within 2 feet of the edges of paved shoulders, dikes, curbs, and sidewalks.
- 4. Pesticides used for maintaining existing planted areas must comply with section 20-1.02B.
- 5. Water plants automatically if the new irrigation system for that area is operational.
- 6. Plant basins must be kept well-formed and free of silt. If the plant basins need repairs, and the basins contain mulch, replace the mulch after the repairs are done.

Add to section 20-2.04:

Prune existing plants to be maintained as ordered. Pruning existing plants to be maintained is change order work.

Replace section 20-3.01C(3) with:

20-3.01C(3) Control and Neutral Conductors Schedule of Values

Submit a schedule of values for control and neutral conductors. Submit the schedule after the wiring plans and diagrams for the electrical components of the irrigation system, except electrical service, have been authorized.

The unit descriptions shown in the table are the minimum. You may include additional unit descriptions. Include the quantity, value, and amount for those additional unit descriptions.

Use the authorized wiring plan and diagrams to determine the quantities required to complete the work.

No adjustment in compensation is made in the contract lump sum price paid for control and neutral conductors work due to differences between the quantities shown in the schedule of values for control and neutral conductors work and the quantities required to complete the work.

Schedule of Values for Control and Neutral Conductors

Contract no. 05-0G0704				
Unit description	Unit	Approximate quantity	Value	Amount
__ AWG (UF) conductors (provide size)	LF			
__ AWG (UF) conductors	LF			
__ AWG (UF) conductors	LF			
__ AWG armor-clad conductors	LF			
__ AWG armor-clad conductors	LF			
__ AWG armor-clad conductors	LF			
No. 5 or larger pull box	EA			
Splices	EA			
__ Sprinkler control conduit (provide size)	LF			
__ Sprinkler control conduit	LF			
__ Sprinkler control conduit	LF			

Total _____

Add to section 20-3.02R(1):

Ball valves must be PVC or chlorinated PVC ball valves.

Add to section 20-3.02R(3)(b):

Remote control valves must be glass filled nylon.

Add to paragraph 2 of section 20-3.02R(3)(b):

- Valves must be equipped with a self-flushing feature manufactured to be used with recycled water. Valves must not have external tubing.

Add to section 20-3.02R(3)(b):

Valves must be or straight pattern as shown.

Add to section 20-9.01A:

Perform plant establishment work for live siltation, willow cuttings, and willow poles.

Limits of plant establishment are the areas:

- Within 6 feet on each side of trench centerline for live siltation.
- Within 6 foot radius of each willow cutting.
- Within 6 foot radius of each willow pole.

The plant establishment period must be Type 1.

Add to section 20-9.03D:

Control weeds by:

1. Hand pulling:
 - 1.1. Within 6 feet on each side of trench centerline for live siltation.
 - 1.2. Within 6 foot radius from each willow cutting and each willow pole.

Add to section 20-9.03I:

Furnish and apply water manually to keep the live siltation, willow cuttings, and willow poles in a healthy growing condition. When watering with a hose, an accepted nozzle, water disbursement device or pressure reducing device must be used. Do not cause erosion of the soil. Several consecutive waterings may be necessary to thoroughly saturate the soil around the live siltation, willow cuttings, and willow poles. At your option, a temporary irrigation system may be installed.

Add to section 20-13.02B:

The stain must be one of the following or equal:

Product	Manufacturer
Rock Stain	Arizona Rain Sprinkling Company Phoenix, AZ
Permeon	Soil-Tech Las Vegas, NV
Natina	Natina Products Coachella, CA

Add to section 20-13.03B:

Stain to produce a brownish earth tone color that will blend the stained surfaces with the surrounding earth colors. The spectrum of brown earth tone colors must be such that the alteration of the color and further color development can be accomplished after the initial stain application.

Stained surfaces must closely resemble the texture and color of the referee sample located at the Resident Engineer's office.

Replace section 20-14 with:

20-14 LIVE SILTATION

20-14.01 GENERAL

20-14.01A Summary

Section 20-14 includes specifications for constructing live siltation.

20-14.01B Submittals

Submit the following:

1. Work plan for maintaining cuttings before planting
2. Organic fertilizer manufacturer's product data sheets
3. Root stimulant manufacturer's product sheet and application instructions.
4. Cobble grading sizes sample

20-14.02 MATERIALS

20-14.02A General

Reserved

20-14.02B Willow Branches

Willow branches must be *Salix lasiolepis*, *Arroyo Willow*

Take willow branches from areas shown or designated by the Engineer. Take willow branches at random from healthy, vigorous plants. Do not cut more than 50 percent of the plants in an area. Do not cut more than 25 percent of an individual plant. Make cuts with sharp, clean tools.

A willow branch must be:

1. Reasonably straight
2. 5 to 6 feet in length
3. At least 2 inches in diameter at the base of the cutting

The top of each cutting must be cut square above a leaf bud. The base must be cut below a leaf bud at approximately a 45 degree angle.

Keep willow branches wet until planted.

20-14.02C Cobble

Cobble must be:

1. Clean
2. Smooth
3. Obtained from a single source

Cobble shall conform to the following grading:

Screen Size (inches)	Percentage Passing (By Mass)
14	100
10	90-100
4	0-10

20-14.02D Organic Fertilizer

Organic fertilizer must be one of the following and comply with the requirements of the following table:

Organic Fertilizer

Product	Guaranteed chemical analysis (N-P-K) (%)	Company
Biosol Mix®	7-2-3	Rocky Mountain Bio-Products Denver, CO
Fertil-Fibers™	6-4-1	Quattro Environmental, Inc. Coronado, CA
Sustane®	5-2-4	Sustane Natural Fertilizer, Inc. Cannon Falls, MN
Or equal ^a	(N) 5 to 7 (P) 1 to 5 (K) 1 to 10	--

^aOr equal must be pelleted or granular and be within the ranges shown for N-P-K. The cumulative (N) release rate must be no more than 70 percent the first 70 days after incubation (86 degrees F) with 100 percent at 350 days or more.

20-14.02E Root Stimulant

Reserved

20-14.03 CONSTRUCTION

20-14.03A General

Reserved

20-14.03B Site Preparation

Remove weeds. Remove loose rocks larger than 2-1/2 inches in maximum dimension unless otherwise authorized.

20-14.03C Planting

Plant willow branches within 48 hours after cutting. Willow branches not planted within 48 hours after cutting or allowed to dry out must not be used.

Excavate a trench at the toe of creek bank.

Water trench and keep wet until planting willow branches.

Plant at least 10 willow braches per 3 linear feet of trench. Place one third willow branch length above trench with at least 3 terminal buds exposed. Angle willow branches toward the creek.

Place 44 pounds organic fertilizer per 1,000 square feet of the trenched area. Thoroughly mix backfill and organic fertilizer without clods, lumps or air pockets. Place 0.25 cubic yards cobble per linear foot along creek side of trench and mound backfill as shown. Compact so branches are not easily removed.

Do not damage bark during placement and compaction.

Dispose of trimmings, prunings and unused cuttings.

Willow cuttings must be watered immediately after planting.

20-14.03D Maintain Live Siltation

Live siltation must be maintained under plant establishment work.

20-14.04 PAYMENT

Live siltation will be measured by linear foot along the centerline of the installed live siltation. No payment is made for unused willow branches, replacement willow branches and planting of replacement willow braches.

**Replace section 20-15 with:
20-15 WILLOW CUTTINGS**

20-15.01 GENERAL

20-15.01A Summary

Section 20-15 includes specifications for constructing willow cuttings.

20-15.01B Submittals

Submit the following:

1. Work plan for maintaining cuttings before planting
2. Root stimulant manufacturer's product sheet and application instructions.

20-15.02 MATERIALS

20-15.02A General

Reserved

20-15.01B Willow Cuttings

Willow cuttings must be *Salix lasiolepis*, *Arroyo Willow*

Take willow cuttings from areas shown or designated by the Engineer. Take willow cuttings at random from healthy, vigorous plants. Do not cut more than 50 percent of the plants in an area. Do not cut more than 25 percent of an individual plant. Make cuts with sharp, clean tools.

A willow cutting must be:

1. Reasonably straight
2. 20 to 24 inches in length
3. $\frac{3}{4}$ to 1-1/2 inch in diameter at the base of the cutting

The top of each cutting must be cut square above a leaf bud. The base must be cut below a leaf bud at approximately a 45 degree angle.

Trim off leaves and branches flush with the stem of the willow cutting.

Keep willow cuttings wet until planted.

20-15.02C Packet Fertilizer

Comply with the specifications for packet fertilizer under section 20-7.02D(1)(c)

20-15.02D Root Stimulant

Reserved

20-15.03 CONSTRUCTION

20-15.03A General

Reserved

20-15.03B Site Preparation

Remove weeds. Remove loose rocks larger than 2-1/2 inches in maximum dimension unless otherwise authorized.

20-15.03C Planting

Plant willow cuttings within 48 hours after cutting. Willow cuttings not planted within 48 hours after cutting or allowed to dry out must not be used.

Planting holes must be perpendicular to the ground line and must be formed with a steel bar or excavated by the use of an auger, post hole digger, or similar tools. Plant holes must be large enough to receive the willow cutting, fertilizer packet and backfill and planted to the specified depth.

Where rock or other hard material prohibits the excavation of the planning holes, excavate new holes and backfill the unused holes.

If the soil in and around the plant hole is not wet before planting, the soil must be watered and kept wet until the willow cutting is planted.

Apply root stimulant according to the manufacturer's instructions.

Plant the base of the willow cutting from 10 to 12 inches deep and have from 3 to 5 bud scars exposed above the ground. If more than 5 bud scars are exposed, remove the excess scars by pruning.

Place 1 fertilizer packet in the backfill of each willow cutting. Place to within 6 to 8 inches of the ground surface and approximately 1 inch from the willow cutting.

Thoroughly mix backfill without clods, lumps or air pockets. Compact so branches are not easily removed.

Do not damage bark during placement and compaction.

Willow cuttings must be watered immediately after planting.

Dispose of trimmings, prunings, and unused willow cuttings.

20-15.03D Maintain Planted Willow Cuttings

Willow cuttings must be maintained under plant establishment work.

20-15.04 PAYMENT

Willow cuttings are measured from actual count in place. No payment is made for unused cuttings, replacement cuttings, and planting of replacement cuttings.

Add to section 20: 20-16 WILLOW POLES

20-16.01 GENERAL

20-16.01A Summary

Section 20-16 includes specifications for constructing willow poles.

20-16.01B Submittals

Submit the following:

1. Work plan for maintaining poles before planting
2. Root stimulant manufacturer's product sheet and application instructions

20-16.02 MATERIALS

20-16.02A General

Reserved

20-16.02B Willow Poles

Willow poles must be *Salix lasiolepis*, *Arroyo Willow*

Take willow poles from areas shown or designated by the Engineer. Take willow poles at random from healthy, vigorous plants. Do not cut more than 50 percent of the plants in an area. Do not cut more than 25 percent of an individual plant. Make cuts with sharp, clean tools.

A willow pole must be:

1. Reasonably straight
2. At least 6 feet in length
3. ½ to 2 inch in diameter at the base of the cutting

The top of each pole must be cut square above a leaf bud. The base shall be cut below a leaf bud at approximately a 45 degree angle.

Trim off leaves and branches flush with the stem of the willow pole.

Keep willow poles wet until planted.

20-16.02C Packet Fertilizer

Comply with the specifications for packet fertilizer under section 20-7.02D(1)(c)

20-16.02D Root Stimulant

Reserved

20-16.03 CONSTRUCTION

20-16.03A General

Reserved

20-16.03B Site Preparation

Remove weeds. Remove loose rocks larger than 2-1/2 inches in maximum dimension unless otherwise authorized.

20-16.03C Planting

Plant willow poles within 48 hours after cutting. Willow poles not planted within 48 hours after cutting or allowed to dry out must not be used.

Planting holes shall be perpendicular to the ground line and must be formed with a steel bar or excavated by the use of an auger, post hole digger, or similar tools. Plant holes must be large enough to receive the willow poles, fertilizer packet, and backfill and planted to the specified depths.

Where rock or other hard material prohibits the excavation of the planting holes, excavate new holes and backfill the unused holes.

If the soil in and around the plant hole is not wet before planting, the soil must be watered and kept wet until the willow pole is planted.

Apply root stimulant according to the manufacturer's instructions.

Willow poles shall be installed into native soil at least 3 feet deep.

Place 1 fertilizer packet in the backfill of each willow pole. Place to within 6 to 8 inches of the ground surface and approximately 1 inch from the cutting.

Thoroughly mix backfill without clods, lumps or air pockets. Compact so branches are not easily removed.

Do not damage bark during placement and compaction.

Willow cuttings must be watered immediately after planting. Water must be applied until the backfill soil around and below each pole is thoroughly saturated.

Dispose of trimmings, prunings, and unused cuttings.

20-16.03D Maintain Planted Willow Poles

Willow poles must be maintained under plant establishment work.

20-16.04 PAYMENT

Willow poles are measured from actual count in place. No payment is made for unused poles, replacement poles, and planting of replacement poles.

AA

DIVISION IV SUBBASES AND BASES
25 AGGREGATE SUBBASES

Add to section 25-1.02A:

Aggregate for Class 1 AS may include processed glass. Place AS with glass only where the AS will be permanently covered.

AA

28 CONCRETE BASES

Replace the 4th paragraph of section 28-2.02 with:

The portland cement content of concrete base must be at least 340 lb/cu yd except, after testing samples from the proposed aggregate supply an increase in the cement content may be ordered. Compensation for an ordered increase is specified in section 28-2.04.

Add to section 28-2.02:

At your option, aggregate for concrete base must comply to either the provisions specified for LCB in section 28-2.02 or the provisions specified for concrete in section 90-1.02C and section 90-1.02C(4).

Add to section 28-2.02:

The combined aggregate grading used in concrete base must be the 1-inch maximum grading.

Add to section 28-2.03E:

Spread and shape concrete base using suitable powered finishing machines and supplement with hand work as necessary. Consolidate concrete base using high-frequency internal vibrators within 15 minutes after the base is deposited on the subgrade. Vibrate with care such that adequate consolidation occurs across the full paving width. Do not use vibrators for extensive weight shifting of the concrete base. Use methods of spreading, shaping, and compacting that produce a dense homogenous base conforming to the required cross section. Methods that result in segregation, voids, or rock pockets must be discontinued.

AA

DIVISION V SURFACINGS AND PAVEMENTS
39 HOT MIX ASPHALT

Add to section 39-1.01:

Produce and place HMA Type A under the Standard construction process.

Add to section 39-1.02C:

Asphalt binder used in HMA Type A must be PG 64-10.

Add to section 39-1.02E:

Aggregate used in HMA Type A must comply with the 3/4-inch -inch HMA Types A and B gradation.

Treat HMA aggregate with lime slurry or with dry lime. Use Lab Procedure LP-7 to treat aggregate with lime slurry for the mix design. Use Lab Procedure LP-6 to treat aggregate with dry lime must use for the mix design.

Add to section 39-1.11:

Before opening a lane to traffic, pave shoulders and median borders adjacent to the lane.

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.

If widening existing pavement, construct new pavement structure on both sides of the existing pavement to match the elevation of the existing pavement's edge for the project's entire length before placing HMA over the existing pavement.

If widening existing pavement, construct new pavement structure on both sides of the existing pavement to match the elevation of the existing pavement's edge at each location before placing HMA over the existing pavement.

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 39-1.16 with:

39-1.16 RUMBLE STRIPS

39-1.16A General

Construct rumble strips in the top layer of HMA surfacing by rolled-in methods.

39-1.16B Materials

Not Used

39-1.16C Construction

Select the method and equipment for constructing ground-in indentations.

Do not construct rumble strips on structures or approach slabs.

Construct rumble strips within 2 inches of the specified alignment. The grinding equipment must be equipped with a sighting device enabling the operator to maintain the rumble strip alignment.

Indentations must comply with the specified dimensions within 0.06 inch in depth and 10 percent in length and width.

The Engineer orders grinding or removal and replacement of noncompliant rumble strips to bring them within specified tolerances. Ground surface areas must be neat and uniform in appearance.

The grinding equipment must be equipped with a vacuum attachment to remove residue from the roadbed.

Dispose of removed material.

On ground areas, apply fog seal coat under section 37-2.

39-1.16D Payment

Rumble strips are measured by the station along the length of the rumble strips without deductions for gaps between indentations.

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 "Reserved" in section 39-1.18 with:

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) 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 ± 0.2 percent of the lime ratio in the accepted JMF. The lime ratio must be within ± 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

Not Used

Replace "Reserved" in section 39-1.19 with:

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) 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 ± 0.2 percent of the lime ratio in the accepted JMF. The lime ratio must be within ± 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

Not Used

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 ± 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/

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 "Reserved" in section 39-1.20 with:

39-1.20A General

39-1.20A(1) Summary

Treat asphalt binder with liquid antistripping (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 ± 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 ± 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

Not Used

Replace section 39-1.31 with:

39-1.31 WARM MIX ASPHALT TECHNOLOGY OPTION

39-1.31A GENERAL

39-1.31A(1) Summary

You may produce HMA Type A, Type B, or RHMA-G using an authorized warm mix asphalt (WMA) technology. For Department-authorized WMA technologies, go to the METS Web site.

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 ± 1 percent
2. 4 test specimens
3. 6-inch gyratory compacted test specimen
4. Test temperature is 122 ± 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.

39-1.31A(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.

39-1.31A(3) Submittals

39-1.31A(3)(a) General

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

1. For WMA water injection foam technology:
 - 1.1. Name of technology
 - 1.2. Laboratory Procedure LP-12 test result for foamed bitumen expansion ratio dated within 12 months of submittal
 - 1.3. Laboratory Procedure LP-12 test result for foamed bitumen half-life dated within 12 months of submittal
 - 1.4. Optimum foaming water content
 - 1.5. Proposed HMA production temperature range
2. For WMA additive technology:
 - 2.1. Name of technology
 - 2.2. Percent admixture by weight of binder and percent admixture by total weight of HMA as recommended by the manufacturer
 - 2.3. Methodology for inclusion of admixture in laboratory-produced HMA
 - 2.4. Proposed HMA production temperature range

The 4th and 5th paragraphs of section 39-1.03C do not apply. Instead submit:

1. California Test 371 test results for dry strength for untreated plant-produced HMA
2. California Test 371 test results for tensile strength ratio for untreated plant-produced HMA
3. 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
4. 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
5. AASHTO T 324 (Modified) test results data showing number of passes with rut depth for plant-produced HMA
6. AASHTO T 324 (Modified) test results data showing number of passes at inflection point for plant-produced HMA

39-1.31A(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 WMA or HMA with WMA technology.

39-1.31A(3)(c) Tests and Samples

The 6th paragraph of section 39-1.03C does not apply.

At production start-up and within $\pm 1,000$ tons of the halfway point of production of HMA produced using 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.

39-1.31A(3)(d) Daily Production Log

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

39-1.31A(4) Quality Control and Assurance

39-1.31A(4)(a) General

Not Used

39-1.31A(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 WMA or HMA using WMA technology. The technical representative must advise you, the Engineer, and the HMA producer regarding 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).

39-1.31A(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. HMA plant manager
5. HMA plant operators
6. HMA paving foreman

39-1.31A(4)(d) Quality Control Testing

In addition to the requirements specified in section 39-2.02B for Standard construction process and section 39-4.02C for QC/QA construction process and for Method construction process, 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	B	RHMA-G		
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)		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 ^a
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 --		

^a Submit test data and 1 tested sample set.

39-1.31A(4)(e) Engineer's Acceptance

In addition to the requirements specified in section 39-2.03A for Standard construction process, section 39-3.02A for Method construction process, and section 39-4.04A for QC/QA construction process, 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	B	RHMA-G	
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 ^a	Report Only ^a	Report Only ^a	
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	--	

^aThe Department does not use California Test 371 tensile strength ratio test results from production to determine specification compliance.

39-1.31B MATERIALS

39-1.31B(1) General

Not Used

39-1.31B(2) Foaming Bitumen

If water injection is used by the WMA technology, the foamed bitumen must have the following quality characteristics:

Quality Requirements for Foaming Bitumen

Quality characteristic	Test method	Requirement
Expansion ratio (minimum)	LP-12	4
Half-life (seconds minimum)	LP-12	4

For Laboratory Procedure LP-12, go to the METS Web site.

39-1.31B(3) Hot Mix Asphalt

39-1.31B(3)(a) General

Not Used

39-1.31B(3)(b) Mix Design

For WMA additive technology, produce HMA mix samples for your mix design using your methodology for inclusion of WMA admixture in laboratory produced HMA. For WMA water injection foam technology, the use of foamed asphalt for mix design is not required.

HMA mix design must comply with the following quality characteristics:

Hot Mix Asphalt Mix Design Requirements

Quality characteristic	Test method	HMA Type		
		A	B	RHMA
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 ^a	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

^a 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 RHMA-G 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

39-1.31B(3)(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.

If you request, the Engineer verifies RHMA-G quality requirements within 5 business days of sampling. The 2nd sentence in the 8th paragraph of section 39-1.03E does not apply.

39-1.31B(4) Production

39-1.31B(4)(a) General

For the Standard and QC/QA construction processes, HMA produced using WMA technology must be produced at a temperature between 240 and 325 degrees F.

For the Method construction process, HMA produced using WMA technology must be produced at the temperatures specified in section 39-1.08.

HMA additives used for antistripping 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.

39-1.31B(4)(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/hr
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 ± 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 ± 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 ± 1.0 percent of the target additive weight.

39-1.31B(4)(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.

39-1.31C CONSTRUCTION

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.

The specified temperatures in section 39-1.11 for transporting, spreading and compacting of HMA apply to HMA produced using WMA technology. For the Method construction process, the specified temperatures in section 39-3.04 for transporting, spreading, and compacting of HMA apply to HMA produced using WMA technology.

AA

70 MISCELLANEOUS DRAINAGE FACILITIES

Add to section 70-5.02A:

70-5.02A(4) Temporary Flared End Sections

Temporary flared end sections must comply with the contract for a permanent flared end sections of the same type except:

- 1. You may use used materials if the used materials are good, sound, and suitable for the purpose intended.
- 2. Removed temporary flared end sections that are not damaged may be installed in the permanent work provided the flared end sections conform to the requirements specified for the permanent work and the flared end sections are new when installed as temporary flared end sections

Add to section 70-5.03:

70-5.03A Temporary Drainage Inlet

Temporary drainage inlet must comply with the contract for a permanent Drainage inlet of the same type

- 1. You may use used materials if the used materials are good, sound, and suitable for the purpose intended.
- 2. The size and type of temporary drainage inlet to be installed at each location as shown.
- 3. Trenches and pits caused by the removal of temporary drainage inlets shall be backfilled

Add to section 70-5:

70-5.10 TEMPORARY CAP INLET

70-5.10A General

This section includes specifications for installing, maintaining and removing temporary cap inlet.

70-5.10B Materials

Steel used for bolts, nuts, and plate cover shall conform to the provisions in Section 75

70-5.10C Payment

The quantity of temporary capped inlets will be determined as units from actual count

AA

DIVISION VIII MISCELLANEOUS CONSTRUCTION

72 SLOPE PROTECTION

Add to section 72-1.04:

Payment for rock slope protection fabric is not included in the payment for rock slope protection.

AA

73 CONCRETE CURBS AND SIDEWALKS

Replace section 73-6 with:

73-6 MINOR CONCRETE (EXPOSED AGGREGATE CONCRETE)

73-6.01 GENERAL

73-6.01A Summary

Section 73-6 includes specification for constructing minor concrete with an exposed aggregate finish using integrally colored concrete.

73-6.01B Submittals

For integrally colored concrete, submit technical data, manufacturer's specifications, and a work plan for mixing, delivery, placement, finishing, and curing of the concrete.

73-6.01C Quality Control and Assurance

Construct a test panel under section 51-1.01D(3)

73-6.02 MATERIALS

Color pigment for integrally colored concrete must comply with ASTM C 979. The color must match color no. 16357 of FED-STD-595.

Welded wire reinforcement must comply with Section 52, "Reinforcement".

Coarse aggregate must comply with the 1 inch x No. 4 primary size coarse aggregate specified in section 90-1.02C(4)(b).

Concrete set retarders must be commercial quality, manufactured specifically for use on the top surface of concrete. The retarder must effectively slow down the setting time and depth of the cement and fine aggregate matrix to permit exposing the aggregates.

Curing compound must comply with ASTM C1315, Type 1, Class A.

73-6.03 CONSTRUCTION

Place reinforcement under section 52.

Place integrally colored concrete under section 51-1.03D(5).

Place and consolidate the concrete so that the coarse aggregate remains uniformly distributed throughout the concrete.

You may apply a concrete set retarder to the surface of the concrete after placing, consolidating, and finishing of the concrete is complete. Apply the set retarder under the manufacturer's instructions.

When the mass of the concrete is sufficiently set to permit removing the matrix of cement and fine aggregate, expose the coarse aggregate:

- 1. With a water spray, coarse brooming, abrasive blasting, or a combination of these procedures. Removal methods must not dislodge or loosen the coarse aggregate from embedment in the mortar.
- 2. To a depth of approximately 3/16 to 3/8 inch. Exposed aggregate surfaces must be uniform in appearance.

Immediately after the cement mortar has hardened sufficiently to resist further removal, clean all cement film and other loose material from the exposed aggregate and all other surfaces with stiff brooms and water.

Cure concrete under section 90-1.03B. Except when operations for exposing the aggregate are underway, cure the concrete. You may use the water curing method. If you remove an area of curing

Submit a materials list for materials to be used and include the name of the manufacturer and the source, model number, description, and standard of manufacture.

Submit manufacturer's descriptive data and catalog cuts including dimensions for the following:

1. Steel sleeve
2. HDPE Casing
3. All Pipe and Fittings
4. Valve Boxes
5. Flexible Couplings
6. Restrained flange adaptors
7. All Valves
8. Gasket material
9. Bolting
10. Coatings including application instructions and MSDS.

Submit a certificate of compliance for HDPE casing.

Submit work plans for horizontal directional drilling. This includes size, capacity and setup requirements of equipment, drilling equipment specifications and operation procedures, location and siting of drilling and receiving pits and method of monitoring and controlling line and grade.

Submit HDD drilling mud mix design and MSDS Sheets

77-2.01B(2) Close-out submittals

Manufacturer's installation, operation and maintenance manuals, bulletins and spare parts lists for all 4-inch and larger valves.

77-2.01B(3) Notifications

Notify 14 days in advance of any temporary shutdowns.

Notify at least 48 hours before any connection is made to the existing water pipeline.

Notify all users who will be temporarily out of service 7 days before shutdown and indicate dates and times.

Notify at least 2 days in advance of pressure and leakage testing of waterline.

77-2.01C Quality Control and Assurance

77-2.01C(1) Qualifications

HDPE installers must be HDPE pipe heat fusion certified.

HDD Contractor must have the following experience:

1. Before submission of bids, Contractors must have completed the installment of at least 5,000 feet of the type of piping specified. Field supervisory personnel employed by the Contractor must have both the necessary experience and manufacturer training in the operation of the directional drilling equipment proposed to be used in the performance of the work.
2. Contractor must submit documentation showing conformance with the experience requirements including, date and duration of work, location, project information (i.e., length, diameter, depth of installation, pipe material, etc.) and project owner information (i.e., name, address, telephone number, contact person).
3. Contractor must also submit a list of field supervisory personnel and their experience with directional drilling operations. At least 1 qualified field supervisor listed must be at the site and be responsible for all work at all times when directional drilling operations are in progress.

77-2.02 MATERIALS

77-2.02A General

Not Used

77-2.02B Casing, Fittings, and Steel Sleeve

Casings must be HDPE and comply with ASTM F 714. Pipe size is based on outside diameter, and must be marked. Each production lot of pipe must be tested from material or pipe for melt index, density, percent carbon (from pipe), dimensions and either quick burst or ring strength depending on equipment.

HDPE pipe fittings must comply with ASTM D 3261. HDPE pipe fittings must be made of the same material and have the same DR as the adjacent piping.

Materials used for the manufacture of HDPE pipe and fittings must be PE4710 high density polyethylene meeting cell classification PE 445474 or higher under ASTM D 3350; and be listed in the name of the pipe and fitting manufacturer in Plastic Pipe Institute Technical Report 4, with a standard grade HDB rating of 1600 psi at 73 degrees F. A certificate stating compliance with this requirement must be included in the piping submittal. Casing pipe and fittings must be supplied by the same manufacturer. Casing must be Performance Pipe, Division Of Chevron Phillips Chemical Company, LLC; JM Eagle or ISCO Pipe Division of ISCO Industries; LLC, or equal.

The size, diameter ratio (DR) and dimensioning basis (iron pipe size, IPS or ductile iron pipe size, DIPS) of HDPE pipe and fittings must be as shown.

Casing end seals must be Pipeline Seal & Insulator (PSI) wrap around, Model W, Advance Products & Systems (APS) Model AW; Calpico Model W, or equal to fit the casing and carrier pipe..

Casing spacers must be Calpico Model PX, or equal.

The successful bidder can obtain the Calpico Model PX casing spacers from FAMCON Pipe Supply, Inc., 200 Lambert Street, Oxnard, CA, 93036 (805) 485-4350.

The price quoted by the supplier for the Model PX casing spacers is \$52.00 each, not including sales tax and delivery.

Steel sleeve must be smooth-welded steel pipe complying with ASTM A252, Grade 2, with water tight butt welded seams and field joints. Butt welding of the sleeve pieces must be prepared by grinding a 45-degree chamfer on the outside edges. Sleeve size and wall thickness must be as shown.

77-2.02C Water Pipe and fittings

Water pipe must be PVC, comply with AWWA C900-07, and be rated for 305 PSI, Standard Dimension Ratio (SDR) 14. Install an elastomeric ring for expansion and contraction at each joint. Pipe must have bell end with a solid cross-section elastomeric ring complying with of ASTM 1869 and E-477 and a nylon locking spline.

PVC pipe must be Certa-Lok as manufactured by CertainTeed Corporation, Valley Forge, PA, or equal. The successful bidder can obtain the Certa-LOK (RJIB) PVC pipe from FAMCON Pipe Supply, Inc., 200 Lambert Street, Oxnard, CA, 93036 (805) 485-4350.

The price quoted by the supplier for the Certa-LOK (RJIB) PVC pipe is \$25.50 per foot, not including sales tax and delivery.

Ductile iron fittings must be flanged end, rated for 250 PSI, and comply with AWWA C110 and must be furnished with a 3-mil thick bituminous coating outside and a 1/8" thick seal coated cement lining inside, in accordance with the latest edition of AWWA C104.

Ductile iron fittings and adjacent valves must be wrapped with polyethylene under AWWA C105 using wrap tape. The minimum polyethylene thickness must be 20 mils.

77-2.02D Gate Valves

Gate valves must be resilient seated and comply with AWWA C509. Gate valves must be iron body, bronze mounted, non-rising stem type, nut-operated, with O-rings, and left turn to open. Valve discs must be cast iron with elastomeric seals bonded to the wedge. The bonding process must comply with ASTM D429. All interior and exterior ferric surfaces of the valve must be coated with a fusion bonded epoxy coating system. Gate valve must be Mueller, Model No. 2360; Clow, Style C509; AVK, Series 25: or equal.

77-2.02E Valve Cans and Lids

Buried valves must have cast iron valve cans with lids permanently labeled "WATER" for potable waterlines. Valve cans must be the 3-piece adjustable type. All materials used in manufacturing must comply with ASTM A48 Class 30. Frame and Cover must exceed H-20 wheel loading. Castings must be dipped in black bituminous coating.

77-2.02F Bolts

Bolts must be Teflon coated carbon steel as supplied by Tripac Fasteners (Corona, CA 951-280-4488). If authorized, bolts may be 316 stainless steel with prevention of galling. This requirement also applies to exterior bolting on valves and couplings.

The successful bidder can obtain Tripac 2000 Blue bolts from FAMCON Pipe Supply, Inc., 200 Lambert Street, Oxnard, CA, 93036 (805) 485-4350.

The price quoted by the supplier for 6 inch by 3/4 inch Tripac 2000 Blue bolts is \$12.00 each, not including sales tax and delivery.

77-2.02G Concrete

Concrete must be commercial quality with not less than 470 pounds of cement per cubic yard.

77-2.02H Tracer Wire

Tracer wire must be 12-gage, soft copper tracer wire with direct burial insulation. Wire must be taped to the PVC pipe at 4-foot maximum spacing. A 32 inch long by 1/2 inch diameter copper grounding rod must be provided at valves. At grounding rod, 2 inches of the insulation must be stripped from locator wires and wires secured to grounding rod with 1/2 inch ground-rod clamp. Allow 6 inch slack in wire.

77-2.02I Cathodic Protection

An S N-A 8 Type THNN wire tapped to the PVC pipe with the tracer wire and exothermically/CAT welded to the existing steel pipe beyond each end of the PVC pipe is required. A minimum welded contact length of 1 inch on each pipe is required. The steel pipe must be cleaned to bare bright metal in the contact area.

77-2.02J Flange Adaptors

Restrained flange adaptors must be gasketed ductile iron. Body of coupling must be fusion bonded, epoxy coated and comply with AWWA standard C116. Restrained flange adaptors must be as manufactured by Dresser, Style 128W; EBAA Iron Sales, Series 2100; Smith-Blair, Style 912; or equal.

77-2.03 CONSTRUCTION

77-2.03A General

Water pipeline installed underground must be PVC water pipe with restrained integral bell and spigot joints and ductile iron fittings. Where shown, the pipeline must be installed in a HDPE casing.

If all excavated material cannot be stored on the roadway in such a manner as to maintain access to property alongside of the work, the surplus material must be removed from the work and stored until needed for backfill.

Dispose of the leakage expected from the existing piping during shutdowns in a manner that does not contaminate the proposed or existing piping. You are responsible for obtaining any required permits for disposal of the pumped water.

If contamination of the existing main occurs, disinfect the main to correct the problem to the Engineer's satisfaction in accordance with Department of Public Health requirements. Once the connection is made, the existing line must be put back in service. Flush the line through adjacent fire hydrants and services as directed by the Engineer.

77-2.03B Casing

Install HDPE casing using horizontal directional drilling or other authorized method.

HDPE pipe sections must be joined using the butt heat fusion process by someone certified in HDPE butt fusion welding.

Drilling operations must not interfere with, interrupt or endanger either surface or subsurface developments. The drilling equipment must be equipped with an alarm system capable of detecting electrical current.

Drilling mud must be a mixture of water, bentonite clay and polymer. Polymer must be designed for the soil type to be encountered and consistent for discharge into a regulated water body.

The drilling equipment must be capable of placing the specified casing at the line and grade and from the pits as shown. The drill head must be a steerable type and provide the necessary cutting surfaces and drilling fluid jets.

Verify continuously the location of the pilot bore hole. Use visible or electronic detection to monitor the location. If electronic equipment is used, accuracy must be warranted to be within 0.1 feet at all points throughout the bore.

The casing must be installed to the line and grade shown. Deviations from line must not exceed 18 inches and deviations from grade, as indicated by depth of cover, must not exceed 6 inches. Deviations from line and grade where specific clearances to existing utilities are shown or where required to avoid an existing utility must be submitted before starting drilling operations. Plot the proposed path of alignment on the plans specifically identifying any deviations. Allow a minimum of 7 days before starting drilling operations for review and authorization. In the event the line or grade deviates from the planned alignment, the rate of return to line or grade must not exceed the carrier pipe manufacturer's allowable deflection.

. The entry angle of the pilot hole and the boring process will maintain a curvature that does not exceed the allowable bending radii of the carrier pipe per the piping manufacturer. The set-up must account for pipe bending in the vertical and horizontal directions.

If authorized, you may (1) withdraw and abandon the boring and begin a second attempt if difficulties are encountered during drilling operations or (2) excavate at the point of the difficulty to correct problems.

The sizing of the pilot hole reamed to facilitate the insertion of the specified pipe must be minimized to maximize support for the pipe. Reaming diameter must not exceed 150 percent of the outside diameter of the pipe being installed. The pipe being pulled into the tunnel must be protected and supported such that it moves freely and is not damaged by stones and debris on the ground during installation.

Allow sufficient length of casing to extend past the termination point for contraction.

Provide video inspection of the casing immediately after installation. Video must be DVD digital format and include stationing and a verbal narrative of anything discovered inside the pipe that may be detrimental to the intended operation of the system.

77-2.03C Water Pipe

Standard laying length must be 20 feet.

Structure excavation and structure backfill for the open-cut portion of the water pipeline must comply with Section 19-3.

All pipe, fittings, and valves must be carefully lowered into the trench by means of a derrick or other suitable tools or equipment in such manner as to prevent damage to the pipe or fittings. Any damaged pipe or fittings must be promptly removed from the site.

Grade and prepare the bottom of the trench to provide a firm and uniform bearing throughout the entire length of the pipe. Unless otherwise provided, the width of the pipe trench must be equal to the outside diameter of the pipe plus a minimum of 4 inches and a maximum of 12 inches on each side of the pipe, unless provisions for shoring equipment are made. In such case, submit proposed methods of shoring. Such method must not cause disruption of the pipe joint after assembly.

Clean pipe of dirt, rock and other debris that may be found in the interior of the pipe. If necessary, swab the pipe to clean it. At the end of each day's work, each end of the pipe must be closed by means of a special bulkhead, plug, or accepted method.

Buried valves must be installed in a valve box. If needed, a stem extension for the nut must be installed to provide a distance from the top of the valve box to the nut of less than 36 inches. Valve boxes must be

installed with a concrete collar extending at least 8 inches below the top of the box. The concrete collar must also extend a minimum of 8 inches beyond the outside of the valve box. Valve boxes must be brought to grade after completion of the paving. In paved areas, the top 2 inches of the collar must normally be finished with hot-mix asphalt concrete. For valve boxes located on city streets and with authorization, you may construct the concrete collar up to the surface, provided you construct the collar with concrete containing lamp black or other material to produce a colored surface consistent with that of the street.

All valves must be tested in place so far as practicable as determined by the Engineer under the conditions specified and any defects revealed in valves or connections under test must be corrected.

Whenever necessary to deflect the pipe from a straight line either in vertical or horizontal plane to avoid obstruction, or where long radius curves are permitted, the degree of deflection at joints must be accepted.

All backfilling must be done as soon and as quickly as possible, and, unless authorized must be completed for the entire trench by the end of each working day. No excavation or trench must be left open more than 24 hours before the installation of the pipe and the backfilling of said excavation or trench.

All compaction testing will be in accordance with California Test Method No. 216, except for local streets where ASTM-D1557 will be used. Notify the Engineer 2 days before the compaction tests are needed, and samples will be taken at points selected by the Engineer and tested by the Department. In the event that the original compaction tests do not meet the minimum acceptable compaction, any subsequent tests as recommended by the Engineer will be paid for by the Contractor. No trench resurfacing will be permitted until the compaction tests are accepted by the Engineer, with the exception of temporary surfacing. The Department will provide the Owner with a report summarizing the test results for the waterline installation.

Underground piping must be provided with thrust blocks at changes in direction of piping, connections or branches from mains 2 inches and larger, and all capped connections. Thrust block sizes must be based on the hydrostatic test pressure and determined from the detail provided on the plans. Install tracer wire along the length of the pipeline construction. Tape wire to the piping at 4-foot maximum spacing using Scotch-wrap 50 tape or equal.

Tracer wire must form a mechanically and electrically continuous line throughout the length of the pipe. Conductors must be spliced and insulated in accordance with the code. The wires must be placed so as not to be broken or stressed by the backfilling operations. Tracer wire must be connected to existing tracer wire on the existing pipe..

Trenches within existing paved street areas must be backfilled flush by the end of the work day, and where the trench cut crosses a street, an intersection, commercial drive approach, or alley approach, it must be covered with 1-1/2 inches minimum of cold mix asphalt surfacing. Temporary surfacing must be maintained in good condition until such time as compaction has been completed and permanent paving is placed.

77-2.03D Flushing and Disinfection of Waterline

Waterlines and appurtenances must be disinfected in accordance with AWWA Standard C651. Disinfect waterlines before pressure and leakage testing. Furnish water for disinfecting and testing waterlines. Make all necessary provisions for conveying the water from the Goleta Water District-designated source to the points of use.

Disinfection must comply with AWWA C651 using the "continuous-feed" method. All disinfection and testing operations must be performed in the presence of the Engineer.

Disinfection operations must be scheduled as late as possible during the contract time period so as to assure the maximum degree of sterility of the facilities at the time the work is accepted..

Waterline disinfection must be performed by personnel certified by the State of California as a Grade 2 Distribution or Treatment Operator or higher as provided by the California Health and Safety Code Division 104, Part 1, Article 3.

After final flushing and before the pipeline is placed into service, bacteriological sampling and testing will be performed by the owner. Unsatisfactory results will require re-disinfection of the pipeline and another round of bacteriological sampling and testing at the Contractor's expense.

77-2.03E Pressure and Leakage Testing of Waterline

The leakage testing procedure must comply with the AWWA C600, Sec. 5.

Furnish all necessary materials, test pumps, instruments and labor to perform the required testing. All such tests must be made in the presence of the Engineer. Take precautions to prevent joints from drawing while pipes and appurtenances are being tested. Repair damage to pipes and appurtenances or to other structures resulting from or caused by tests.

All piping must be tested after assembly and before backfill, pipe wrapping, connecting fixtures, wrapping joints and covering the pipe. After testing, repair all leaks and retest to determine that leaks have been stopped.

77-2.04 PAYMENT

Not Used

77-3 SEWER LINE

77-3.01 GENERAL

77-3.01A Summary

Section 77-3 includes specifications for constructing sewer lines as shown.

Before fabrication of materials, pothole and inspect pipeline connections with existing facilities to verify that measurements and elevations are as indicated as shown.

77-3.01B Submittals

Submit a workplan and operation schedule for dewatering of excavations. You may be required to demonstrate the system proposed and to verify that adequate equipment, personnel, and materials are provided to dewater the excavations at all locations and times.

Submit a workplan designing and implementing sewage bypassing pumping system suitable for completing the work in dry and sanitary conditions.

Submit product data for all materials being incorporated into the work including pipe, pipe fittings, pipe accessories, concrete, coatings, and appurtenances.

Submit manufacturer's installation instructions that indicate special procedures required to install products.

Submit certificate's of compliance that certify products meet or exceed specified requirements.

77-3.01C Notifications

Notify the Engineer and Goleta Sanitary District at:1 William Moffett Place, Goleta, CA 93117 (805-967-4519) 7 days in advance of any temporary shutdown of a sewer main.

Provide written notifications to residents and customers affected by the scheduled shutdown.

77-3.01D Quality Control and Assurance

77-3.01D(1) Testing and cleaning pipelines

Comply with Section 306-1.4 of the Greenbook.

Comply with Section 500-1.1.4 of the Greenbook for cleaning of pipeline before CCTV.

77-3.01D(2) Field Tests on Installed Sewer Pipe

You must furnish the material, labor, and equipment for making tests for leakage and infiltration of groundwater. Tests must be made after the sewer trench has been backfilled and before paving. All sections of sewer line must be in accordance with the following requirements for leakage and infiltration

tests. Each section of pipe line between manholes must be tested by a low pressure air test. If for some reason an air pressure test is not feasible, a water infiltration test will be used.

You may perform any preliminary tests desired which are not harmful to the lines before backfilling is completed.

Before performing final tests, thoroughly clean the pipe installation.

77-3.01D(3) Air Pressure Test

Comply with Section 306-1.4.4 of the Greenbook.

You must furnish test plugs, an air compressor, valves, gauges, and other required apparatus, and personnel for conducting the acceptance test.

Testing must include the following procedures:

1. Air must be introduced into pipeline until 3.0 psi gage pressure is reached.
2. Maintain internal air pressure between 2.5 and 3.5 psi gage pressure for at least 2 minutes. Pressure in the pipeline must not be allowed to exceed 5 psi gage pressure.
3. Air pressure must be reduced to 2.5 psi gage pressure. A stop watch must be used to determine the elapsed time for the pressure to drop from 2.5 psi to 1.5 psi gage pressure.
4. Elapsed time is shown in the following table:

Air Test Chart		
Diameter of pipe (inches)	Length of pipe (Feet)	Allotted test minutes
4	All	2
6	0-300	2
6	300-370	2.5
6	≥ 370	3
8	0-170	2
8	170-210	2.5
8	210-250	3
8	250-290	3.5
8	≥ 290	3.75
10	0-110	2
10	110-165	3
10	165-215	4
10	≥ 215	4.75
12	0-115	3
12	115-155	4
12	155-190	5
12	≥ 190	6
15	0-120	5
15	120 to 165	7
15	≥ 165	15
18-30	All	15

If elapsed time is less than that shown in the table, make necessary corrections to the pipeline and retest until satisfactory.

77-3.01D(4) Water Infiltration Test

If, in the construction of a section of the sewer between any 2 structures, excessive groundwater is encountered, the test for leakage must not be used. The end of the sewer at the upper structure must be closed sufficiently to prevent the entrance of water. Pumping of the groundwater must be discontinued for at least 3 days after which the amount of water intercepted at the structure below the plugged end of the sewer must not exceed 0.2 gallon per minute per inch of nominal diameter of pipe per thousand feet of

length of sewer being tested. The length of house connections must not be used in computing the length of sewer main being tested.

If the leakage or infiltration, as shown by the tests, is greater than the amount specified, the pipe must be overhauled and re-laid until the leakage is reduced satisfactorily.

Regardless of the results of the above tests, any visible evidence of individual leaks must be corrected.

After backfilling and compaction testing is completed, sewer lines must be balled, flushed and cleaned, with Engineer's approval before connection to the sewer system.

You must furnish all sewer line plugs necessary for blocking off all lines as required by the Engineer until final acceptance.

77-3.01D(5) Deflection Testing

Furnish a mandrel and other required apparatus, and personnel for conducting a mandrel test. The mandrel must have an odd number of webs, minimum of 5, and measure pipe deflection not greater than 5 percent of the pipe diameter. The mandrel must be supplied by the pipe manufacturer.

77-3.01D(6) Pipe Cleaning

All installed sewer mains and trunks must be cleaned with a hydraulic jet-rodder with spinning nozzle as approved by the Engineer, in accordance with the manufacturer's instructions and recommendations. Screens used for trapping debris must be approved by the Engineer and secured with a nylon rope. Cleaning, including screen installation and removal, must be done in the presence of the Engineer.

77-3.01D(7) CCTV Inspection of Sewer Pipes

Comply to Section 500-1.1.5 of the Greenbook. All new sewer lines installed and all rehabilitated sewer lines must be inspected by close circuit television (CCTV). CCTV recordings must be recorded in color on a DVD and have audio and text comments and clearly legible footage readings. Before the acceptance of sewer pipe, provide DVD video inspection records of the new and rehabilitated sewer pipes. Television inspection must be conducted after construction of the system is completed and follow the sequence from the upstream end to the downstream end of the project.

The inspection must be conducted in the presence of the Engineer. The video inspection must be performed while the upstream lines are plugged or bypassed. The line must be dry except for flow from the laterals in the section of line being televised. Before camera inspection, water must be flushed through the pipe being inspected to make low points easier to detect. During camera inspection, if pipe sags are apparent, the Engineer may require you to flow water through the pipe. The rate of flow must be as required by the Engineer.

CCTV inspection must be performed utilizing a rotating lens video camera system. The video inspection and recording performed with this camera must stop at each lateral or side sewer and the head must be rotated to look up the lateral to identify potential defects. Defects must be closely inspected by rotating the camera head for a close-up view.

Before rehabilitation of a pipeline, the host pipe must be inspected in the presence of the Engineer, with video documentation, to ensure the pipeline has been cleaned. No pipe must be lined without notifying and receiving Engineer's approval. Each pipe liner is subject to inspection by the Engineer immediately before it is installed.

Log sheets indicating date of inspection, location of services, upstream manhole and downstream manhole, direction of view, pipeline length, and all found defects must be kept during inspection. DVDs must be numbered and marked with the location of the inspection. DVDs become the property of the Department once inspection is complete.

The camera must be equipped with a remote reading footage counter and checked and calibrated, if required, before inspection begins. Camera runs should start from the upstream end of the pipe being inspected and must be pulled through at a speed that allows a close of inspection and must not exceed 20 feet per minute. The Camera must be in focus and display a clear view of the pipe on the field monitor. The inspection must end at the center of the downstream manhole of the pipe being inspected.

Final video inspection records must be continuous and sequential for each reach of pipeline from either the downstream end of the reach to the upstream end of the pipeline segment or vice versa.

77-3.01E(8) Test Record

Records must be made of each pipe system test. These records include:

1. Date of test.
2. Location, description and identification of piping tested
3. Test fluid/medium
4. Test pressure
5. Remarks to include such items as:
 - 5.1. Leaks (type, location)
 - 5.2. Repairs made on leaks
 - 5.3. Certification by Contractor and signed acknowledgment by Engineer

77-3.02 MATERIALS

77-3.02A General

Fusible PVC wastewater pipe or fusible PVC pressure pipe for wastewater may be used for restrained-joint PVC pipe shown.

77-3.02B Restrained-Joint Polyvinyl Chloride Plastic Pipe

77-3.02B(1) General

Restrained-joint PVC pipe, 4–12 inches, with iron pipe size (IPS) outside diameters must be used for trenchless construction techniques or as the carrier pipe through a casing pipe.

Restrained joint PVC must comply with ASTM D2241.

77-3.02B(2) Materials

Pipe must be made from unplasticized PVC compounds having a minimum cell classification of 12454, as defined in ASTM D1784. The compound must qualify for a hydrostatic design basis (HDB) of 4000 psi for water at 73.4 degrees F, and comply with the requirements of ASTM D2837.

77-3.02B(3) Dimensions

Nominal outside diameters and wall thicknesses of restrained-joint pipe must comply with ASTM D2241. Restrained-joint pipe must be furnished in 4, 6, and 8 inch sizes, Class SDR21 (equivalent pressure rating = 200 psi) and 10 and 12 inch sizes, Class SDR26 (new product-equivalent pressure rating TBD). Pipe must be furnished in standard lengths of 10 or 20 feet.

77-3.02B(4) Joints

Pipe must be joined using a non-metallic spline-lock system for maximum reliability and interchangeability. High-strength, flexible thermoplastic splines must be inserted into mating, precision-machined grooves in the pipe and bell to provide full 360 degree restraint with evenly distributed loading.

An internal grip locking ring is also acceptable as manufactured by JM Eagle.

Integral bell joints must incorporate an elastomeric sealing gasket and comply with ASTM F477. Joints must be designed to meet the leakage test requirements of ASTM D3139.

77-3.02B(5) Workmanship

Pipe must be homogeneous throughout and free from voids, cracks, inclusions and other defects, and be as uniform as commercially practicable in color, density and other physical characteristics.

77-3.02B(6) Marking

Pipe must be legibly and permanently marked in ink with the following minimum information:

1. Nominal size (for example, 10 In.)
2. Outside Diameter System (O.D.S.) PVC
3. Standard Dimension Ratio (SDR) and pressure rating
4. Manufacturer's name or trademark and production record code

77-3.02B(7) Approved Manufacturers

CertaFlo™ GreenLine restrained-joint PVC pipe from CertainTeed Corporation, Eagle Loc 900 restrained-joint PVC pipe from JM Eagle™ or equal.

77-3.02C Fusible Polyvinyl Chloride Wastewater Pipe

All piping must be made from PVC compound complying with ASTM D1784, cell classification 12454. Fusible PVC pipe must be tested at the extrusion facility for properties required to meet all applicable parameters as outlined in AWWA C900, AWWA C905, and applicable sections of ASTM D2241. Testing priority must be in conformance with AWWA C900 and AWWA C905.

77-3.02D Fusible PVC Pressure Pipe for Wastewater

77-3.02D(1) General

Fusible PVC pipe must comply with AWWA C900, ASTM D2241 or ASTM D1785 for standard dimensionality, as applicable. Testing must be in accordance with the referenced AWWA standard.

Fusible PVC pipe must be extruded with plain ends. The ends must be square to the pipe and free of any bevel or chamfer. There must be no bell or spigot of any kind incorporated into the pipe.

Fusible PVC pipe must be manufactured in a standard 40 feet nominal length, or custom lengths as specified.

Pipe must be homogeneous throughout and be free of visible cracks, holes, foreign material, blisters, or other visible deleterious faults.

Fusible PVC pipe must be green in color for wastewater use.

Pipe must be marked as follows:

1. Nominal pipe size
2. PVC
3. Dimension Ratio (DR), standard dimension ratio (SDR), or schedule
4. AWWA pressure class, or standard pressure rating for non-AWWA pipe, as applicable
5. AWWA standard designation number, or pipe type for non-AWWA pipe, as applicable
6. Extrusion production-record code
7. Trademark or trade name
8. Cell Classification 12454 and/or PVC material code 1120 may also be included

77-3.02D(2) Approved Manufacturers

Pipe must be manufactured by Underground Solutions, Inc., IPEX, Inc., JM Eagle, or equal.

77-3.02D(3) Fusion Technician Requirements

Fusion technician must be fully qualified by the pipe manufacturer to install fusible PVC pipe of the type and size being used. Qualification must be current as of the actual date of fusion performance on the project.

77-3.02D(4) PVC Fusion Process

77-3.02D(4)a General

Fusible PVC pipe will be handled in a safe and non-destructive manner before, during, and after the fusion process and in accordance with this specification and pipe manufacturers recommendations..

Fusible PVC pipe will be fused by qualified fusion technicians, as documented by the pipe supplier.

Each fusion joint must be recorded and logged by an electronic monitoring device (data logger) connected to the fusion machine.

Only appropriately sized and outfitted fusion machines that have been approved by the pipe supplier must be used for the fusion process. Fusion machines must incorporate the following elements:

1. Heat Plate: Heat plates must be in good condition with no deep gouges or scratches. Plates must be clean and free of any debris or contamination. Heater controls must function properly; cord and plug must be in good condition. The appropriately sized heat plate must be capable of maintaining a uniform and consistent heat profile and temperature for the size of pipe being fused, per the pipe manufacturer's guidelines.
2. Carriage: Carriage must travel smoothly with no binding at less than 50 psi. Jaws must be in good condition with proper inserts for the pipe size being fused. Insert pins must be installed with no interference to carriage travel.
3. General Machine: Overview of machine body must yield no obvious defects, missing parts, or potential safety issues during fusion.
4. Data Logging Device: An approved datalogging device with the current version of the pipe supplier's recommended and compatible software must be used. Datalogging device operations and maintenance manual must be with the unit at all times. If fusing for extended periods of time, an independent 110V power source must be available to extend battery life.

77-3.02E Polyvinyl Chloride Plastic Pipe and Accessories

77-3.02E(1) General

Comply with Section 207-17 of the Greenbook.

PVC pipe with nominal pipe sizes between 4 inches and 15 inches must comply to the requirements of ASTM D3034. Pipe sizes 4 to 15 inches must have a dimension ratio of SDR 35 and stiffness of 46 psi at 5 percent deflection. The bell must consist of integral wall section with a locked-in solid cross section elastomeric gasket which meets the requirements of ASTM F477. The joint must be water-tight and comply with ASTM D3212.

PVC must be made of compounds conforming to ASTM D1784 with a minimum cell classification of 12364 or 12454 as defined in ASTM D1784. The pipe color must be green.

77-3.02E(2) Pipe Fitting

All fittings and accessories must be manufactured by the pipe supplier and have a bell and/or spigot configurations compatible with that of the pipe.

77-3.02E(3) Quality and Workmanship

The pipe and fitting manufacturer's production facilities must be open for inspection by the Owner or his designated agents with a reasonable advanced notice. During inspection, the manufacturer must demonstrate that it has facilities capable of manufacturing and testing the pipe and/or fittings to standards required by this specification.

77-3.02E(4) Pipe Packaging, Handling and Storage

The manufacturer must package the pipe in a manner designed to deliver the pipe to the project neatly, intact, and without physical damage. The transportation carrier must use appropriate methods and intermittent checks to insure the pipe is properly supported, stacked, and restrained during transport such that the pipe is not nicked, gouged, or physically damaged. Pipe must be stored on clean, level ground to prevent undue scratching or gouging. If the pipe must be stacked for storage, such stacking must be done in accordance with the pipe manufacturer's recommendations. The pipe must be handled in such a manner that it is not pulled over sharp objects or cut by chokers or lifting equipment.

77-3.02F Precast Concrete Manhole

77-3.02F(1) General

Manufacturing methods and materials for precast concrete manhole units must comply to ASTM C478. Concrete must have a minimum compressive strength of 4000 psi at 28 days.

Manhole concrete bases may be approved precast bases or cast in place concrete bases. Cast in place concrete bases must consist of Class 560-C-3250 under Section 201-1 of the Greenbook.

Pipe to manhole connections must be installed with a positive watertight seal.

Comply to Section 208-6 of the Greenbook.

77-3.02F(2) Coating

After installation, manhole interiors must be coated in accordance with Section 500-2. Coating system must be one of the following:

1. Polyurethane (100 percent solids) protective lining system for manholes must comply with Section 500-2.7 of the Greenbook.
2. Epoxy (100 percent solids) protective lining system for manholes must comply with Section 500-2.8 of the Greenbook.
3. Cured-In-Place fiberglass maintenance hole liner system in accordance with these Special Provisions.

Air-placed coating thickness must be a minimum of 125 mils. Epoxy and polyurethane coating must be applied with plural component airless spray equipment by workmen experienced with similar applications involving underground confined spaces.

77-3.02F(3) Coating warranty

Manufacturer must warrant all work against defects in materials and workmanship for a period of 5 years from the date of final acceptance of the project. Manufacturer must, within a reasonable time after receipt of written notice thereof, repair defects in materials and workmanship within said 5 year period and any damage to other work caused by such defects or the repairing of same.

77-3.02G Sewer Pipe Bedding and Encasement

Bedding and encasement for sewer pipelines must be crushed rock, 3/4 inch gradation.

Comply with Section 200-1.2 of the Greenbook.

77-3.02H Trench Backfill

In areas with unimproved surfaces, trench backfill above the pipe zone may be native material from the trench excavation or select imported material with a sand equivalent greater than 50 meet.

Within City of Goleta public right-of-ways: trench backfill above the pipe zone must comply with the Goleta Sanitary District Standard Drawing No. 4. Allowable materials are the following:

1. Crushed aggregate base
2. Crushed miscellaneous base
3. Material with a sand equivalent greater than 50

77-3.02I Welded Steel Casing Pipe

77-3.02I(1) General

Steel casing pipe must be welded steel pipe. Steel pipe casings must comply with AWWA C206. Steel must be ASTM A53, Grade B and have a minimum yield strength of 35 KSI. Casing pipe must be fabricated in sections for welded field joints. Field joints must be welded butt joints. Each end of the casing for butt welding must be prepared by providing 1/4 inch by 45 degree chamfer on the outside edges. Spiral weld casing will not be allowed. Casing pipe must be welded under AWWA C206. Exterior of steel casing pipe must have 2 coats of coal tar epoxy with a minimum thickness of 16 mils in accordance with AWWA C203.

The minimum wall thickness must be as shown. The casing pipe minimum thickness as shown is what is required by the Goleta Sanitary District. With approval, you may use casings of a larger diameter than those shown.

77-3.02I(2) Casing Pipe Anchors

Steel casing pipe anchors must be constructed at the locations and to the dimensions shown.

Reinforcement must be either Grade 40 or Grade 60 billet steel complying with ASTM A615/A615M. Steel bending processes must comply with the requirements of Manual of Standard Practice of the Concrete Reinforcing Steel Institute. Bending or straightening must be accomplished so that the steel will not be damaged. Kinked rebar must not be used.

Concrete must comply with Section 201-1 of the Greenbook.

77-3.02I(3) Casing Spacers

Casing spacers must be prefabricated and be centered restrained. Casing spacers must be carbon steel with 8-inch wide chocks and have a factory applied fusion bonded epoxy coating. Bolts, nuts, washers and other fasteners must be 304 stainless steel. Casing spacers must be Pipeline Seal and Insulator (PSI), PowerSeal, Model 4810, Advanced Products & Systems, Inc. (APS) Model SI or equal. The spacers must be located at 8-foot intervals (maximum) along the pipe and with 2 feet of the joints on both pipe segments. A minimum of 3 spacers must be installed on each carrier pipe segment.

77-3.02I(4) Casing End Seals

The ends of the casing pipe must be sealed to prevent the entrance of foreign material. A standard pull-on or wrap-around synthetic seal must be used. Standard prefabricated casing seals must be a synthetic rubber "S" shape, pull-on seal with stainless steel bands, Pipeline Seal and Insulator (PSI), CCI Pipeline Systems, Advanced Products & Systems, Inc. (APS) or equal. The seals must be the model number recommended by the manufacturer for the sizes of pipe furnished.

77-3.03 CONSTRUCTION

77-3.03A General

Not Used

77-3.03B Environmental Controls

Do not impair operation of existing sewer systems. Prevent construction material, pavement, concrete, earth, volatile and corrosive wastes, and other debris from entering sewers.

You must maintain original site drainage wherever possible.

77-3.03C Water Pollution Control

You must not divert storm water flows to public sewers. You must not cause or permit action which would cause an overflow to an existing waterway.

77-3.03D Shutdowns and Bypassing

77-3.03D(1) Shutdowns and Bypassing of Sewer Services (Handling Sewage Flows)

Comply to Section 7-8.5 of the Greenbook.

Sewer service to customers must not be shut down without the approval of the Engineer. Work must be scheduled to avoid peak flow periods when requested by the Engineer. If a shutdown cannot be avoided, the you must furnish, install, and maintain facilities to the customers, as directed by the Engineer.

You must provide for dewatering of the trench. If a sewer bypass is used, the sewer flow must be intercepted at an upstream manhole, pumped and conveyed in a closed conduit to a downstream manhole until the new sewer pipe and lateral connections are in place and operational.

77-3.03D(2) Bypassing/Pumping of Sewer Mains(Handling Sewage Flows)

Work must be scheduled to avoid peak flow periods when requested by the Engineer. The sewer bypass must intercept flow at an upstream manhole, be pumped and conveyed in a closed conduit to a downstream manhole until the new sewer pipe is connected and the manhole liner is repaired and tested.

Furnish, install and operate pumps, pipes, appliances and equipment of sufficient capacity to handle all flows to prevent sewage from backing up in the pipeline. Wastewater flow must not be interrupted. Sewage must be conveyed in closed conduits and disposed of in downstream sanitary sewer facilities. Sewage must not be allowed to flow in trenches or be covered by backfill.

Provide sewage diversion for the pipe replacement and manhole coating construction. Pumps and bypass lines must be of adequate capacity and size to handle all flows. Pumps must be water cooled and equipped with sound attenuation enclosures to reduce emitted noise to less than 65 dB(A) at 50 feet.

During sewer bypass pumping operations, the pumps must be continuously attended and monitored by personnel qualified to operate the pumping equipment. This includes after hour periods when you may not be conducting operations. The personnel monitoring the pump must be equipped with a cellular telephone so that additional personnel can be contacted in case of an emergency.

You must have onsite a fully functional and fueled standby pump that can be placed in service if the primary pumping unit malfunctions.

The bypass piping must be a continuous piece of polyethylene solid wall pipe joined by butt-fusion welding. For low flow conditions (less than 50 gallons per minute) a continuous fire hose may be approved by the Engineer. Victaulic aluminum pipe couplings and fittings are not allowed. Mechanical joints will not be allowed in the polyethylene bypass piping except at pump, manifold and discharge connections. The bypass pipe must be of a pressure class that is compatible with the bypass pump.

If sewage backup occurs and enters buildings, you are responsible for clean-up, repair, property damage cost and claims.

If sewage backup occurs resulting in overflow and spills, you are responsible for clean-up, repair, property damage cost and claims.

77-3.03E Dewatering

Comply with Section 7-8.6.4 of the Greenbook.

Trench excavation and construction must be conducted under dry conditions. You must be responsible for providing a construction area free of water to allow operations to be carried out entirely in dry conditions.

All dewatering operations must be adequate to assure the integrity of the finished project.

Where critical structures or facilities exist adjacent to areas of proposed dewatering, reference points must be established and observed at frequent intervals to detect any settlement which may develop.

Dewatering, where required, may include the use of well points, sump pumps, temporary pipelines for water disposal, rock or gravel placement, and other means.

You must have on hand, at all times, sufficient pumping equipment and machinery in good working condition and must have available, at all times, competent workers for the operation of the pumping equipment. Adequate standby equipment must be kept available at all times to insure efficient dewatering and maintenance of dewatering operation during power failure.

Dewatering for structures and pipelines must begin before starting construction or when groundwater is 1st encountered, as is deemed appropriate to avoid delays, and must be continuous until such times as water can be allowed to rise in accordance with the provisions of this Section or other requirements.

At all times dewatering must be conducted in such a manner as to preserve the undisturbed bearing capacity of the subgrade soils at proposed bottom of excavation.

If foundation soils are disturbed or loosened by the upward seepage of water or an uncontrolled flow of water, the affected areas must be excavated and replaced with drain or float rock.

Maintain the water level below the bottom of excavation in all work areas where groundwater occurs during excavation, construction and backfilling.

Prevent flotation of pipe and other such material by maintaining continuous removal of water.

If well points or wells are used, they must be adequately spaced to provide the necessary dewatering and must be sand packed and/or other means used to prevent pumping of fine sands or silts from the subsurface. A continual check must be maintained to ensure that the subsurface soil is not being removed by the dewatering operation.

Dispose of water in a suitable manner without damage to adjacent property. You are responsible for obtaining any permits that may be necessary to dispose of water.

The release of groundwater to its static level must be performed in such a manner as to maintain the undisturbed state of the natural foundation soils, prevent disturbance of compacted backfill and prevent flotation or movement of structures and pipelines.

Maintain a log of all non-storm water discharges. The log must document the date, location, method, and quantity of the discharge.

77-3.03F Pipeline Construction Methods

77-3.03F(1) Trench Excavation

Comply with Section 306-1 of the Greenbook.

Excavated material must be immediately placed in trucks and removed from the site. Stockpiling material is not allowed.

The bottom of the trench must be graded and prepared to provide a firm and uniform bearing throughout the entire length of the pipe barrel. Suitable excavations must be made to receive the bell of the pipe and the joint must not bear upon the bottom of the trench. All adjustment to line and grade must be made by excavating or filling with gravel bedding material under the body of the pipe and not by wedging or blocking.

If the trench is excavated below the required grade, the part of the trench excavated below grade must be corrected. Bedding material must be placed over the full width of trench in compacted layers not exceeding 6 inches in depth to the established grade with allowance for the pipe base.

When subgrade is encountered that, in the opinion of the Engineer, is unsuitable for pipe support, the Engineer may order the excavation to be carried to an approved depth below the bottom of the pipe and backfilled with crushed aggregate, or an engineered stabilization method, to the lines and grades shown of the plans and/or specified by the Engineer. This is change order work.

The minimum width of the trench at the top of the pipe zone must be the outside diameter of the pipe plus 16 inches plus the thickness of required shoring and bracing.

The maximum width at the top of the trench will not be limited, except where excess width of excavation would cause damage to adjacent structures or property. Slope trench walls or provide shoring and sheeting as required for construction and safety.

Open trenches during non-construction hours will not be allowed unless specifically authorized by the Engineer. You must use steel traffic plates to cover open trenches during non-construction hours. Trench plates placed in the traveled way, both vehicular and pedestrian, must have a slip resistant surface.

77-3.03F(2) Trench Stabilization

Where unstable, spongy, or otherwise unsuitable foundation soils are encountered, as determined by the Engineer, they must be removed to firm soils and replaced with compacted bedding material or to a minimum depth of 1 foot below the normal bottom of trench and be replaced with float rock. A non-woven geotextile fabric must be placed to fully encase the float rock and provide separation between the float rock and the pipe bedding material. Non-woven geotextile fabric must meet the minimum physical properties of Type 180N per Table 213-2.2(A) of the Greenbook. This is change order work.

77-3.03F(3) Handling and Transportation of Pipe

During loading, transportation, unloading, storage, and laying, every precaution must be taken to prevent damage to the pipe, linings, and coatings.

Any unit of pipe that, in the opinion of the Engineer, is damaged beyond repair must be removed from the site of the work and replaced with another unit.

Heavy canvas or nylon slings of suitable strength must be used for lifting and supporting materials. Chains, cables or other products that may cause damage to the pipe must not be used to handle the pipe.

Store all rubber gaskets in a cool, well ventilated place and do not expose to direct sunlight. Do not allow contact with oils, fuels, petroleum, or solvents. Do not reuse gaskets when joints are disassembled and refitted.

77-3.03F(4) Pipe Preparation and handling

Distribute material on the job no sooner than 3 days in advance of the laying, except as approved by the Engineer.

Each pipe and fitting must be carefully inspected before being installed. Any pipe which, in the opinion of the Engineer, is damaged must not be used and must be promptly removed from the site. Clean ends of

pipe thoroughly. Remove foreign matter and dirt from inside of pipe and keep clean during and after installation.

Use proper implements, tools, and facilities for the safe and proper protection of the pipe. Carefully handle pipe in such a manner as to avoid any physical damage to the pipe. Do not drop or dump pipe into trenches under any circumstances.

77-3.03F(5) Preparation of Trench

At the location of each joint, dig bell (joint) holes of ample dimensions in the bottom of the trench and at the sides where necessary to permit the joint to be made properly and to permit easy visual inspection of the entire joint and checking of the gasket with a feeler gauge as applicable.

Do not lay pipe in water, on unstable subgrade, or when, in the opinion of the Engineer, trench conditions are unsuitable.

77-3.03F(6) Preparing Pipe for Trench

Inspect each pipe and fitting before the pipe and/or fitting is lowered into the trench.

Wipe the joints of the pipe, fittings, and appurtenances clean of all dirt, grease, and foreign matter before the pipe is lowered into trench.

77-3.03F(7) Laying Buried Pipe

All pipe, fittings, and appurtenances must be installed in accordance with the manufacturer's instructions. Pipe must not be directly jacked into place unless specifically designated.

All buried pipe must be laid on the prepared crushed rock base and bedded to ensure uniform bearing. Take all precautions necessary to prevent the "uplift" or "floating" of the line before the completion of the backfilling operation.

Follow pipe laying operations closely with backfilling of the trenches, as applicable, with sufficient material to prevent the pipe from moving. Place backfill carefully and simultaneously on both sides of the pipe to avoid displacement of the pipe and damage to the joints and coating, if any.

Take the necessary precautions required to prevent excavated or other foreign material from entering the pipe during the laying operation. Remove all foreign material from the pipe or joint ring before the next pipe is placed. At all times, when laying operations are not in progress, at the close of the day's work, or whenever the workmen are absent from the job, close and block the open end of the last laid section of pipe with a watertight plug to prevent entry of foreign material or creep of the gasketed joints. End closure must be sufficient to prevent trench water from entering pipe. Keep water out of the trench.

77-3.03F(8) Pipe and Fitting Installation

Do not allow foreign material to enter the pipe while it is being placed in the trench.

After the first length of pipe is installed in the trench, secure pipe in place with pipe zone material tamped under and along sides to prevent movement. Keep ends clear of backfill. After each section is jointed, place pipe zone material as specified to prevent movement.

Wherever it is necessary to deflect pipe from a straight line, either in the vertical or horizontal plane, do not exceed 75 percent of the amount of joint deflection recommended by the pipe, fitting, or coupling manufacturer and as reviewed by the Engineer.

77-3.03F(9) Carrier Pipe Installation

The pipe installed within the casing must be restrained joint PVC pipe with casing spacers. You must provide pipe, restrained joints and casing spacers per manufacturer's recommendations.

The annular space between the casing and carrier pipe must not be filled. Upon installation of the carrier pipe, seal each end of casing with a standard pull-on or wrap around synthetic rubber end seal with stainless steel bands.

77-3.03F(10) Structure Backfill

Comply with Section 300-3 of the Greenbook

83-1.02B(1)(b)(iii) Crumb Rubber Aggregate

Crumb rubber must consist of ground or granulated scrap tire rubber from automobile and truck tires. Tire buffings are not allowed. Crumb rubber aggregate must be ground and granulated at ambient temperature.

The gradation of the crumb rubber aggregate must meet the requirements of the following table:

Gradation Requirements	
Sieve size	Percentage passing
1/2"	100
3/8"	90–100
1/4"	35–45
No. 4	5–15
No. 8	0–5
No. 16	0

Crumb rubber aggregate must not contain more than 0.01 percent of wire by mass of crumb rubber and must be free of oils and volatile organic compounds.

Comingling of crumb rubber from different sources is not allowed.

The crumb rubber aggregate must be 3.5 ± 0.5 percent by weight of the concrete.

83-1.02B(1)(b)(iv) Reinforcing Fibers

Reinforcing fibers for minor concrete must be:

1. Polypropylene fibers with an engineered sinusoidal contoured profile manufactured specifically for use as concrete reinforcement.
2. Blended ratio of 4 parts by weight of coarse monofilament fibers with maximum individual fiber lengths of 2 ± 1/2 inch and 1 part by weight of fine fibrillated polypropylene fibers of various lengths and thicknesses. If the coarse and fine reinforcing fibers are supplied by the same manufacturer, they may be premixed in a sealed 5-lb degradable bag.
3. From a commercial source.
4. Concrete ingredient as described in your mix design and as recommended by the manufacturer.

The reinforcing fiber content of minor concrete must be 5 lbs/cu yd.

83-1.02B(1)(b)(v) Coloring Agent

If a color for concrete is specified in section 83-1.02B(1)(b)(i), the coloring agent must be integral to the concrete mix and added at the concrete plant.

If the curing compound method is used, use curing compound no. 6.

83-1.02B(1)(b)(vi) Block-Out Material

Use a commercially available expanded polystyrene foam for the block-out material. The expanded polystyrene foam must have a compressive strength of 13 ± 5 psi at 10 percent deformation when tested under ASTM D1621.

You may substitute any appropriate material that meets the compressive strength requirements of the expanded polystyrene foam if authorized.

83-1.02B(1)(c) Construction

83-1.02B(1)(c)(i) General

Areas to receive vegetation control must be cleared of vegetation, trash, and debris. Dispose of removed material.

83-1.02B(1)(c)(ii) Earthwork

Excavate areas to receive vegetation control. Where vegetation control abuts the existing surfacing, the edge of the existing surfacing must be on a neat line or must be cut on a neat line to a minimum depth of

2 inches before removing the surfacing. The finished elevation of the excavated area to receive vegetation control must maintain planned flow lines, slope gradients, and contours of the job site.

Grade areas to receive vegetation control to a smooth, uniform surface and compact to a relative compaction of not less than 95 percent.

Dispose of surplus excavated material uniformly along the adjacent roadway, except as specified in section 14-11.

83-1.02B(1)(c)(iii) Block Out

Install block-out material as shown.

If block-out material is supplied in more than 1 piece, tape the pieces together to make a smooth surface on the top and sides.

Ensure block-out material does not move during concrete placement.

83-1.02B(1)(c)(iv) Placing Minor Concrete

Place minor concrete for vegetation control by hand.

Strike off and compact minor concrete with a mechanical or vibratory screed device. Apply a broom finish. Match the finished grade to the adjacent section of vegetation control, pavement, shoulder, or existing grade.

83-1.02B(1)(d) Payment

Vegetation control (minor concrete) is measured from the actual areas placed. The Department does not pay for vegetation control (minor concrete) placed outside the dimensions shown.

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 per the manufacturer's recommendations . 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 13th 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 per the manufacturer's recommendations . 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.
3. TERMINAL SYSTEM (TYPE X-TENSION) - Terminal System (Type X-Tension) must be a X-Tension Guard Rail End Terminal as manufactured by Barrier Systems, Inc., located in Vacaville, CA, and must include items detailed for terminal system (Type X-Tension) in conformance with manufacturer's details . The X-Tension guard rail terminal system can be obtained from the distributor, Statewide Safety and Signs, Inc., 130 Grobric Court, Fairfield, CA 94533, telephone (800) 770-2644.

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. Paint must be metallic acrylic resin type spray paint. Prior to applying terminal system

identification, the surface to receive terminal system identification must be removed of all dirt, grease, oil, salt or other contaminants by washing the surface with detergent or other suitable cleaner. Rinse thoroughly with fresh water and allow to fully dry.

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.

For Type FLEAT 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.

For terminal system (Type X-Tension), the steel post and soil anchor shall be, at the Contractor's option, either driven, with or without pilot holes, or placed in drilled holes. Space around the steel post and soil anchor shall be backfilled with selected earth, free of rock, placed in layers approximately 4 inches thick and each layer shall be moistened and thoroughly compacted. The wood terminal posts shall be inserted into prepared holes by hand and backfilled in the same manner as the steel post and soil anchor. Wood terminal posts shall not be driven. All blocks shall be wood or plastic.

After installing the terminal system, dispose of surplus excavated material in a uniform manner along the adjacent roadway where designated by the Engineer.

Replace "Reserved" in section 83-1.02D(2) with:

California ST-40 bridge rail must consist of metal railing mounted on a reinforced concrete parapet.

Stud bolts must comply with the specifications for stud connectors in section 55-1.02C.

Reinforced concrete must comply with sections 51 and 52.

Ferrous metal parts must be galvanized. Galvanizing must comply with section 75-1.05.

Paint rail under section 59-3.

There must be no chemical treatment of galvanized surfaces before cleaning and painting. Nuts, bolts, and washers must be galvanized after fabrication and must not be painted.

Submit shop drawings for the bridge rail.

The shop drawings must include the following:

1. Details for venting and pickup holes in rails and sleeves
2. Railing layout
3. Complete details for the construction of the work including methods of construction, sequence of shop and field assembly, and installation procedures

Submit 7 copies of each set of drawings. Allow 25 days for review. Upon certification, the Engineer will stamp or mark the drawings certified and return 2 sets of these drawings to you for use during construction.

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 86-2.05A:

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:

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

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

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 50 Higuera Street, San Luis Obispo CA 93401.

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 cover must have an electronic marker cast inside.

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

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

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

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

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

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

Manufacturer's instructions must provide guidance on:

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

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

86-2.06B(3) Construction

Do not install pull box in curb ramps or driveways.

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

If only the cover is to be replaced, anchor the cover to the pull box.

Add to section 86-2.08A:

Secure conductors and cables to the projecting end of the conduit in pull boxes.

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

Splices must be insulated by "Heat-shrink tubing."

Delete the 8th paragraph of section 86-2.09E.

Replace section 86-2.18 with:

86-2.18 NUMBERING ELECTRICAL EQUIPMENT

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 86-5.01A(1):

Loop wire must be Type 2.

Loop detector lead-in cable must be Type B.

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

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

Add to section 86-5:

86-5.03 VEHICLE SENSOR NODE REPLACEMENT

86-5.03A General

86-5.03A(1) Summary

Section 86-5.03 includes specifications for removing and installing vehicle sensor nodes (VSN) in the roadway as shown.

86-5.03A(2) Submittals

Submit warranty documentation before installation.

86-5.03A(3) Quality Control and Assurance

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

District 5 Maintenance Shop
50 Higuera Street
San Luis Obispo CA 93401

Provide software updates from manufacturer during warranty period. The department does not pay for software updates.

86-5.03B Materials

86-5.03B(1) General

The VSN is part of the wireless vehicle detector system (WVDS) which also include wireless repeater (RP), wireless access point (AP), epoxy sealant, and plastic shell.

VSN components including epoxy sealant and plastic shell must be manufactured by Sensys Networks, Incorporated, 2560 Ninth Street, Suite 219, Berkeley, CA 94710, telephone (510) 548-4620.

VSN components must be new. The manufacturing date of VSN components as shown by date codes or serial numbers of electronic circuit assemblies must be within 6 months from the date of installation.

Obtain VSN components directly from manufacturer. Prices for components not including taxes or shipping are:

Part Number	Description	Quantity
		1-99
00-240-100-0-000	VSN240F Flush Mount Sensor	\$575
900-240-100-0-005	Epoxy sealant for sensor	\$85
--	Clear Plastic Shell for Sensor	\$7.50

The above prices are accurate for orders placed before December 31st, 2013 if delivery is accepted within 90 days from order date.

86-5.03B(2) Functional Capabilities

The WVDS system communications between the VSN and the AP is wireless.

The communications link between the VSN and AP must conform to FCC rules.

The communication protocol must be open and freely available for use in the public domain.

Provide the unit's communication protocol message structure organization, data packet length, and necessary information to make use of message.

The VSN must be reconfigurable over the wireless interface. Provide a minimum of 16 channels per location to avoid interference from other users of the communication band during reconfiguration.

The link budget must be 93 dB or more.

After an AP is powered on, the associated VSN must respond within 100 seconds.

The WVDS system must provide the following measurements per lane:

1. Vehicle count in a data collection interval in units of vehicles.
2. Percent occupancy in a data collection interval in units of 0.05 percent.
3. Vehicle speed in units of miles per hour (mph). If more than one VSN is installed in a lane, then vehicle speed:
 - 3.1. Per vehicle in units of mph.
 - 3.2. Median speed in a data collection interval in units of mph.
 - 3.3. Mean speed in a data collection interval in units of mph.
 - 3.4. Distribution of vehicle speeds in a data collection interval in bins of <30 mph, 30-34 mph, 35-39 mph, 75-79 mph, and 80 or more mph in units of vehicles.
4. Vehicle length. If more than one VSN is installed in a lane, the vehicle length::
 - 4.1. Per vehicle in units of 0.1 feet.
 - 4.2. Distribution of vehicles length in a data collection interval in bins of <20.0 feet, 20.0-39.9 feet, 40.0-59.9 feet, and 60 or more feet in units of vehicles.

The time interval for data collection must be user-selectable at a minimum of 30-seconds intervals. The time interval for reporting must be user-selectable from a list containing at minimum, 30 seconds, 1 minute, 5 minutes, 15 minutes, 1 hour, and 24 hours.

Each VSN must have the following programmable event reporting parameters:

1. Transmit interval from a minimum value of 6 seconds.
2. Reporting latency from a minimum range of 6 to 30 seconds.
3. Presence and pulse modes.
4. RF watchdog timer.
5. Synchronize event reporting to AP clock or to detection events.
6. Speed Trap: measurement/time interval between 2 consecutive VSN.

The WVDS must have the capability of outputting the state of each detector 1 or 0 in real time in sync with each vehicle passage event for the traffic. This data will be available electronically via the EIA-232 or EIA-485 or Ethernet communication port in a well documented format.

86-5.03B(3) Vehicle Sensor Node

Each VSN consists of a magnetometer sensor, a microprocessor with firmware in non-volatile memory, a wireless transceiver, and a battery in a single housing.

The housing must be fully encapsulated to provide a minimum of 8 years of operation over a temperature range of -34 to 165 degrees F. The housing must be capable of being installed in a cylindrical hole that is no larger than 4.00 inches in diameter and 3.00 inches deep.

The VSN must automatically recalibrate in the event of a detector lock within 5 minutes.

Each VSN must be individually addressable with a unique identifier, and capable of transmitting to the AP. Each VSN must also be capable of receiving detector parameters, microprocessor firmware and other commands from the AP without loss of data.

Each VSN must have the following programmable detection parameters:

1. Onset sensitivity and delay
2. Off sensitivity
3. Holdover time
4. Adaptable orientation
5. Auto recalibration timeout

Include the software and documentation necessary to configure the VSN with the AP and store and retrieve detection data.**86-5.03B(4) Sealant**

The sealant for the installation of the wireless detector sensor units must be a self-leveling joint sealant and must be applied at a minimum temperature of 32 °F. The surface to be bonded must be free of debris, moisture and anything else that will interfere with the sealant bond. Dispose of excess sealant.

86-5.03C Construction

86-5.03C(1) Installation and Calibration

Provide personnel skilled in the installation and calibration of WVDS components.

Before the installation of any WVDS component:

1. Obtain the Engineer's approval.
2. Demonstrate that components will operate independently and will not interfere with other components at any other site or other equipment in the vicinity.
3. Demonstrate that each VSN will be installed within range of its corresponding AP and is located within a 60-degree horizontal cone, measured from perpendicular.
4. Test all VSNs and demonstrate proper operation and communication between the VSN and the AP.

The maximum distances between a VSN and the AP are as follows:

AP mounting height	Maximum distance from VSN to AP
12 feet	75 feet
18 feet	105 feet
24 feet	150 feet

Install each VSN in the roadway per manufacturer's recommendations and as shown. Holes cored in the pavement must be cleaned and thoroughly dried before installing VSN. Do not allow residue resulting from core drilling to flow across shoulders or lanes occupied by traffic. Remove residue from the pavement surface by vacuuming or other approved method before any residue flows off of the pavement surface. Dispose of residue from core drilling. The cored pavement must be back-filled per manufacturer's recommendations. Dispose of any excess epoxy from the roadway without the use of solvents

Reconfigure and demonstrate successful communication between each VSN, and the AP after installation of all components.

Installation and materials must conform to the requirements of the manufacturer and these special provisions

Verify the performance of each site. Submit recorded medium and other materials at the conclusion of the performance test. The accuracy of each site must be determined and documented so that each site may be approved or rejected separately. Failure to submit the recorded medium and materials at the conclusion of testing invalidates the test. The recorded medium serves as acceptance evidence and must not be used for calibration. The calibration must have been completed prior to testing and verification.

Provide all software needed for the analysis.

86-5.03C(2) Acceptance Testing

Notify the Engineer 15 working days before the location is ready for acceptance testing. Conduct acceptance testing during a normal work day between the hours of 0800 and 1600. Demonstrate the operation of all WVDS units satisfying the functional requirements. The Engineer has the right to reject the VSNs if the demonstration fails.

The Contractor must provide:

1. All equipment, documentation, materials and special tools required for acceptance testing of the system.
2. All software required to program, reconfigure and support the WVDS system and any components installed at the time of acceptance testing.

Verify accuracy of the WVDS system by comparing the WVDS vehicle counts to recorded video image counts for the same period.

Accuracy testing must be done at 5 percent of the WVDS locations as selected by the Engineer.

Clear and visible recorded video images for at least one peak period must be provided for all lanes that the WVDS was installed in. The recorded video images must show the viewed detection scene, detectors operation, and the vehicle traffic count.

Time-stamp to 1/100 of a second must be made available so that the data can be overlaid on the recorded video. The 6-hour analysis periods and associated time synced data must be transferred to a DVD for viewing on a PC.

The video camera must be located and oriented so that traffic is visible in all lanes. The video field of view must totally encompass the area in which vehicles are detected.

The Contractor must provide a means for synchronizing the test start and end times or provide software that displays time stamped WVDS data along with the video images of the moving vehicles.

The Contractor must provide the original recording medium and documentation that supports the accuracy analysis and make a copy of these materials for their own use.

Start the accuracy test at the specified date and time.

The following video recording and analysis options that depend on the available traffic conditions are acceptable; however the heaviest expected traffic conditions should be used, if possible:

1. The minimum analysis period must be 30 minutes when the recording includes congested traffic (vehicles traveling at less than 20 mph for five or more minutes in any lane).
2. The minimum analysis period must be 45 minutes when the traffic flow exceeds 1500 vehicles per hour in any lane during the test period.
3. The minimum analysis period must be 60 minutes when the flow is less than 1500 vehicles per hour in every lane.
4. The analysis must be based on a minimum of 500 detected vehicles in every lane and cover the same time period for all lanes. The time periods within the selected video will be selected by the Engineer. The total vehicle count for every lane must be used and include the first and last partial vehicles for each lane.

Errors in the start and finish of the WVDS and manual counts are included in the performance criterion as specified. Each real vehicle in the video should be identified as either detected correctly (DC), missed, (M), or over counted (OC).

WVDS unit count must be compared to vehicle counts under traffic conditions specified above. The data accuracy must be determined by the formula:

$$\text{Accuracy (Absolute Value)} = 100\{1 - (\text{TC} - \text{WC}) / \text{TC}\}$$

where TC= Traffic Count derived from the media recording and WC = WVDS reported count over the same period of time.

Average overall accuracy must be greater than 95 percent across all lanes. Minimum accuracy for each time period must be greater than 90 percent per lane. The Engineer will review the results from the acceptance testing and accept or reject the results within 7 days. Determination of any vehicle anomalies or unusual occurrences will be decided by the Engineer. Data or counts that are not agreed upon by the Engineer must be considered errors and count against the unit's calibration. If the Engineer determines that the WVDS does not meet the performance requirements, the Contractor will have seven days to re-calibrate and re-test the unit and re-submit new test data. Following three failed attempts, the Contractor must replace the WVDS system with a new unit.

Repairing, replacing, and retesting of WVDS components due to failure or rejection must be at the Contractor's expense.

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 k Ω . The appropriate thermocouple wire must be used. The leads must be a minimum of 6 feet. Documentation must accompany the test unit that details the type of sensor used.

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

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

Failure of the luminaire that renders the unit noncompliant with section 86-6.01 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:

District 5 Maintenance Shop
50 Higuera Street
San Luis Obispo CA 93401

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.20

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 $y \geq 0$ (street side)</p> <p>where: x = direction longitudinal to the roadway y = direction transverse to the roadway and the luminaire is offset from the center of the pattern by 23 feet to the house side of the pattern.</p>

Roadway 4	40	0.2	<p>Pattern defined by an ellipse with the equation:</p> $\frac{x^2}{(92)^2} + \frac{(y - 23)^2}{(55)^2} = 1$ <p>where: x = direction longitudinal to the roadway y = direction transverse to the roadway and the luminaire is offset from the center of the pattern by 23 feet to the house side of the pattern.</p>
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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 color no. from 26152 to 26440 or from 36231 to 36375, or color no. 36440 of FED-STD-595.

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

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

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

Chemical property	Requirement (percent)
Silicon dioxide (SiO ₂) ^a	90 min
Loss on ignition	5.0 max
Total alkalis as Na ₂ 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 ^b	
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 ^c	0.10 percent max
Surface area when testing by nitrogen adsorption under ASTM D 5604	40.0 m ² /g min

^aSiO₂ in crystalline form must not exceed 1.0 percent.

^bWhen tested under AASHTO M 307 for strength activity testing of silica fume.

^cIn 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	http://www.dot.ca.gov/hq/esc/oe/weekly_ads/all_advertised.php	--	--
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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

5 CONTROL OF WORK

10-19-12

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

and 100 or more working days

10-19-12

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

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

10-19-12

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

, including VECPs

10-19-12

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

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

10-19-12

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

10-19-12

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

field supervisory personnel

10-19-12

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

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

06-20-12

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

30

06-20-12

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

Performance of

06-20-12

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

06-20-12

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

06-20-12

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

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

06-20-12

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

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

06-20-12

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

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

07-20-12

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

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

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

07-20-12

or substituted

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

10-19-12

work

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

10-19-12

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

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

10-19-12

Submit action and informational submittals to the Engineer.

7 LEGAL RELATIONS AND RESPONSIBILITY TO THE PUBLIC

07-27-12

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

09-16-11

25 days

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

09-16-11

125 days

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

09-16-11

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

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

07-27-12

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

FHWA-1273 Nondiscrimination Clauses

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

Replace the form in section 7-1.11B with:

07-20-12

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

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

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

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

ATTACHMENTS

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

II. NONDISCRIMINATION

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

I. GENERAL

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

6. Training and Promotion:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

III. NONSEGREGATED FACILITIES

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

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

IV. DAVIS-BACON AND RELATED ACT PROVISIONS

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

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

1. Minimum wages

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

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

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

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

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

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

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

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

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

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

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

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

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

2. Withholding

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

3. Payrolls and basic records

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

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

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

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

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

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

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

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

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

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

4. Apprentices and trainees

a. Apprentices (programs of the USDOL).

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

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

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

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

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

b. Trainees (programs of the USDOL).

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

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

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

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

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

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

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

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

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

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

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

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

10. Certification of eligibility.

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

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

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

V. CONTRACT WORK HOURS AND SAFETY STANDARDS ACT

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

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

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

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

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

VI. SUBLETTING OR ASSIGNING THE CONTRACT

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

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

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

- (1) the prime contractor maintains control over the supervision of the day-to-day activities of the leased employees;
- (2) the prime contractor remains responsible for the quality of the work of the leased employees;
- (3) the prime contractor retains all power to accept or exclude individual employees from work on the project; and
- (4) the prime contractor remains ultimately responsible for the payment of predetermined minimum wages, the submission of payrolls, statements of compliance and all other Federal regulatory requirements.

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

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

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

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

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

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

VII. SAFETY: ACCIDENT PREVENTION

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

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

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

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

VIII. FALSE STATEMENTS CONCERNING HIGHWAY PROJECTS

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

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

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

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

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

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

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

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

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

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

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

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

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

1. Instructions for Certification – First Tier Participants:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

2. Instructions for Certification - Lower Tier Participants:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

XI. CERTIFICATION REGARDING USE OF CONTRACT FUNDS FOR LOBBYING

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

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

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

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

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

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

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:

$$Q_h = HMATT \times X_a$$

04-20-12

Replace "weight of dry aggregate" in the definition of the variable X_a in section 9-1.07B(2) with:

total weight of HMA

04-20-12

Replace the formula in section 9-1.07B(3) with:

$$Q_{rh} = RHMATT \times 0.80 \times X_{arb}$$

04-20-12

Replace "weight of dry aggregate" in the definition of the variable X_{arb} in section 9-1.07B(3) with:

total weight of rubberized HMA

04-20-12

Replace the heading of section 9-1.07B(4) with:

Hot Mix Asphalt with Modified Asphalt Binder

04-20-12

Add between "in" and "modified" in the introductory clause of section 9-1.07B(4):

HMA with

04-20-12

Replace the formula in section 9-1.07B(4) with:

$$Q_{mh} = MHMATT \times [(100 - X_{am}) / 100] \times X_{mab}$$

04-20-12

Replace "weight of dry aggregate" in the definition of the variable X_{mab} in section 9-1.07B(4) with:

total weight of HMA

04-20-12

Replace the formula in section 9-1.07B(5) with:

$$Q_{rap} = HMATT \times X_{aa}$$

04-20-12

Replace "weight of dry aggregate" in the definitions of the variables X_{aa} and X_{ta} 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:

04-19-13

copies

Add to section 19-3.01A(3)(b):

01-20-12

For soil nail walls, wall zones are specified in the special provisions.

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:

01-18-13

90-1

Replace the heading of section 19-3.03C with:

04-19-13

19-3.03B(4) Cofferdams

Replace the heading of section 19-3.03D with:

04-19-13

19-3.03B(5) Water Control and Foundation Treatment

Replace the 1st paragraph of section 19-3.03E(3) with:

01-20-12

Compact structure backfill behind lagging of soldier pile walls by hand tamping, mechanical compaction, or other authorized means.

Replace the 2nd paragraph of section 19-3.03F with:

01-20-12

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.

Add between the 2nd and 3rd paragraphs of section 19-3.03K:

01-20-12

Before you excavate for the installation of ground anchors in a wall zone:

1. Complete stability testing
2. Obtain authorization of test data

binder replacement: Amount of RAP binder in OBC in percent.

surface course: Upper 0.2 feet of HMA exclusive of OGFC.

Add to the end of the paragraph in section 39-1.02A:

10-19-12

as shown

Replace the paragraphs in section 39-1.02F with:

02-22-13

39-1.02F(1) General

You may produce HMA Type A or B using RAP. HMA produced using RAP must comply with the specifications for HMA, except aggregate quality specifications do not apply to RAP. You may substitute RAP at a substitution rate not exceeding 25 percent of the aggregate blend. Do not use RAP in OGFC and RHMA-G.

Assign the substitution rate of RAP aggregate for virgin aggregate with the JMF submittal. The JMF must include the percent of RAP used.

Provide enough space for meeting RAP handling requirements at your facility. Provide a clean, graded, well-drained area for stockpiles. Prevent material contamination and segregation.

If RAP is from multiple sources, blend the RAP thoroughly and completely. RAP stockpiles must be homogeneous.

Isolate the processed RAP stockpiles from other materials. Store processed RAP in conical or longitudinal stockpiles. Processed RAP must not be agglomerated or be allowed to congeal in large stockpiles.

AASHTO T 324 (Modified) is AASHTO T 324, "Hamburg Wheel-Track Testing of Compacted Hot Mix Asphalt (HMA)," with the following parameters:

1. Target air voids must equal 7 ± 1 percent
2. Number of test specimens must be 4
3. Test specimen must be a 6-inch gyratory compacted specimen
4. Test temperature must be set at 140 ± 2 degrees F
5. Measurements for impression must be taken at every 100 passes
6. Inflection point defined as the number of wheel passes at the intersection of the creep slope and the stripping slope
7. Testing shut off must be set at 25,000 passes

39-1.02F(2) Substitution Rate of 15 Percent or Less

For a RAP substitution rate of 15 percent or less, you may stockpile RAP during the entire project.

39-1.02F(3) Substitution Rate Greater than 15 Percent

For a RAP substitution rate greater than 15 percent, fractionate RAP into 2 sizes, a coarse fraction RAP retained on 1/4-inch screen and a fine fraction RAP passing 1/4-inch screen.

Sample and test processed RAP at a minimum frequency of 1 sample per 1000 tons with a minimum of 6 samples for each processed RAP stockpile. The asphalt binder content and specific gravity must meet the processed RAP quality characteristics. If a processed RAP stockpile is augmented, sample and test processed RAP quality characteristics at a minimum frequency of 1 sample per 500 tons of augmented RAP.

The processed RAP asphalt binder content must be within ± 2.0 percent of the average processed RAP stockpile asphalt binder content when tested under ASTM D 2172, Method B. If a new processed RAP stockpile is required, the average binder content of the new processed RAP stockpile must be within ± 2.0 percent of the average binder content of the original processed RAP stockpile.

The maximum specific gravity for processed RAP must be within ± 0.06 when tested under California Test 309 of the average maximum specific gravity reported on page 4 of your *Contractor Hot Mix Asphalt Design Data* form.

Replace "less than 10 percent" in note "b" in the table in the 5th paragraph of section 39-1.02E with:

01-20-12

10 percent or less

Replace items 7 and 8 in the 5th paragraph of section 39-1.03A with:

02-22-13

7. Substitution rate by more than 5 percent if your assigned RAP substitution rate is 15 percent or less
8. Substitution rate by more than 3 percent if your assigned RAP substitution rate is greater than 15 percent
9. Average binder content by more than 2 percent from the average binder content of the original processed RAP stockpile used in the mix design
10. Maximum specific gravity of processed RAP by more than ± 0.060 from the average maximum specific gravity of processed RAP reported on page 4 of your *Contractor Hot Mix Asphalt Design Data* form
11. Any material in the JMF

Replace the 1st paragraph of section 39-1.03B with:

02-22-13

Perform a mix design that produces HMA with the values for the quality characteristics shown in the following table:

HMA Mix Design Requirements

Quality characteristic	Test method	HMA type		
		A	B	RHMA-G
Air void content (%)	California Test 367	4.0	4.0	Section 39-1.03B
Voids in mineral aggregate (% min.) No. 4 grading 3/8" grading 1/2" grading 3/4" grading	California Test 367	17.0	17.0	--
		15.0	15.0	--
		14.0	14.0	18.0–23.0
		13.0	13.0	18.0–23.0
Voids filled with asphalt (%) No. 4 grading 3/8" grading 1/2" grading 3/4" grading	California Test 367	65.0–75.0	65.0–75.0	Note a
		65.0–75.0	65.0–75.0	
		65.0–75.0	65.0–75.0	
		65.0–75.0	65.0–75.0	
Dust proportion No. 4 and 3/8" gradings 1/2" and 3/4" gradings	California Test 367	0.6–1.2	0.6–1.2	Note a
		0.6–1.2	0.6–1.2	
Stabilometer value (min.) No. 4 and 3/8" gradings 1/2" and 3/4" gradings	California Test 366	30	30	--
		37	35	23

^a Report this value in the JMF submittal.

For RAP substitution rate greater than 15 percent, the mix design must comply with the additional quality characteristics shown in the following table:

**Additional HMA Mix Design Requirements
for RAP Substitution Rate Greater Than 15 Percent**

Quality characteristic	Test method	HMA type		
		A	B	RHMA-G
Hamburg wheel track (minimum number of passes at 0.5 inch average rut depth)	AASHTO T 324 (Modified) ^a			
PG-58		10,000	10,000	--
PG-64		15,000	15,000	
PG-70		20,000	20,000	
PG-76 or higher		25,000	25,000	
Hamburg wheel track (inflection point minimum number of passes)	AASHTO T 324 (Modified) ^a			
PG-58		10,000	10,000	--
PG-64		10,000	10,000	
PG-70		12,500	12,500	
PG-76 or higher		15000	15000	
Moisture susceptibility (minimum dry strength, psi)	California Test 371 ^a	120	120	--
Moisture susceptibility (tensile strength ration, %)	California Test 371 ^a	70	70	--

^aTest plant produced HMA.

For HMA with RAP, the maximum binder replacement must be 25.0 percent of OBC for surface course and 40.0 percent of OBC for lower courses.

For HMA with a binder replacement less than or equal to 25 percent of OBC, you may request that the PG asphalt binder grade with upper and lower temperature classifications be reduced by 6 degrees C from the specified grade.

For HMA with a binder replacement greater than 25 percent but less than or equal to 40 percent of OBC, you must use a PG asphalt binder grade with upper and lower temperature classifications reduced by 6 degrees C from the specified grade.

Replace item 4 in the list in the 1st paragraph of section 39-1.03C with:

4. JMF renewal on a *Caltrans Job Mix Formula Renewal* form, if applicable

01-20-12

Add after the last paragraph of section 39-1.03C:

For RAP substitution rate greater than 15 percent, submit with the JMF submittal:

1. California Test 371 tensile strength ratio and minimum dry strength test results
2. AASHTO T 324 (Modified) test results

02-22-13

For RAP substitution rate greater than 15 percent, submit California Test 371 and AASHTO T 324 (Modified) test results to the Engineer and to:

Moisture_Tests@dot.ca.gov

Replace the 2nd paragraph of section 39-1.03E with:

04-20-12

Use the OBC specified on your *Contractor Hot Mix Asphalt Design Data* form. No adjustments to asphalt binder content are allowed. Based on your testing and production experience, you may submit an adjusted aggregate gradation TV on a *Contractor Job Mix Formula Proposal* form before verification testing. Aggregate gradation TV must be within the TV limits specified in the aggregate gradation tables.

Add between the 3rd and 4th paragraphs of section 39-1.03E:

04-20-12

Asphalt binder set point for HMA must be the OBC specified on your *Contractor Hot Mix Asphalt Design Data* form. When RAP is used, asphalt binder set point for HMA must be:

$$\text{Asphalt Binder Set Point} = \frac{\frac{BC_{OBC}}{\left(1 - \frac{BC_{OBC}}{100}\right)} - R_{RAP} \left[\frac{BC_{RAP}}{\left(1 - \frac{BC_{RAP}}{100}\right)} \right]}{100 + \frac{BC_{OBC}}{\left(1 - \frac{BC_{OBC}}{100}\right)}}$$

Where:

BC_{OBC} = optimum asphalt binder content, percent based on total weight of mix

R_{RAP} = RAP ratio by weight of aggregate

BC_{RAP} = asphalt binder content of RAP, percent based on total weight of RAP mix

Replace item 4 in the list in the 8th paragraph of section 39-1.03E with:

04-20-12

4. HMA quality specified in the table titled "HMA Mix Design Requirements" except:
 - 4.1. Air void content, design value ± 2.0 percent
 - 4.2. Voids filled with asphalt, report only
 - 4.3. Dust proportion, report only

Replace the 12th paragraph of section 39-1.03E with:

04-20-12

If tests on plant-produced samples do not verify the JMF, the Engineer notifies you and you must submit a new JMF or submit an adjusted JMF based on your testing. JMF adjustments may include a change in aggregate gradation TV within the TV limits specified in the aggregate gradation tables.

Replace the 14th paragraph of section 39-1.03E with:

01-20-12

A verified JMF is valid for 12 months.

Replace the last sentence in the 15th paragraph of section 39-1.03E with:

01-20-12

This deduction does not apply to verifications initiated by the Engineer or JMF renewal.

Replace the 16th paragraph of section 39-1.03E with:

02-22-13

Except for RAP substitution rate greater than 15 percent, for any HMA produced under the QC/QA process the Department does not use California Test 371 test results for verification.

Add between the 1st and 2nd paragraphs of section 39-1.03F:

04-20-12

Target asphalt binder content on your Contractor *Job Mix Formula Proposal* form and the OBC specified on your *Contractor Hot Mix Asphalt Design Data* form must be the same.

Delete the 4th paragraph of section 39-1.03F.

01-20-12

Replace items 3 and 5 in the list in the 6th paragraph of section 39-1.03F with:

01-20-12

3. Engineer verifies each proposed JMF renewal within 20 days of receiving verification samples.
5. For each HMA type and aggregate gradation specified, the Engineer verifies at the Department's expense 1 proposed JMF renewal within a 12-month period.

Add between the 6th and 7th paragraphs of section 39-1.03F:

01-20-12

The most recent aggregate quality test results within the past 12 months may be used for verification of JMF renewal or the Engineer may perform aggregate quality tests for verification of JMF renewal.

Replace section 39-1.03G with:

04-20-12

39-1.03G Job Mix Formula Modification

For an accepted JMF, you may change asphalt binder source one time during production.

Submit your modified JMF request a minimum of 3 business days before production. Each modified JMF submittal must consist of:

1. Proposed modified JMF on *Contractor Job Mix Formula Proposal* form
2. Mix design records on *Contractor Hot Mix Asphalt Design Data* form for the accepted JMF to be modified
3. JMF verification on *Hot Mix Asphalt Verification* form for the accepted JMF to be modified
4. Quality characteristics test results for the modified JMF as specified in section 39-1.03B. Perform tests at the mix design OBC as shown on the *Contractor Asphalt Mix Design Data* form
5. If required, California Test 371 test results for the modified JMF.

With an accepted modified JMF submittal, the Engineer verifies each modified JMF within 5 business days of receiving all verification samples. If California Test 371 is required, the Engineer tests for California Test 371 within 10 days of receiving verification samples.

The Engineer verifies the modified JMF after the modified JMF HMA is placed on the project and verification samples are taken within the first 750 tons following sampling requirements in section 39-1.03E, "Job Mix Formula Verification." The Engineer tests verification samples for compliance with:

1. Stability as shown in the table titled "HMA Mix Design Requirements"
2. Air void content at design value ± 2.0 percent
3. Voids in mineral aggregate as shown in the table titled "HMA Mix Design Requirements"
4. Voids filled with asphalt, report only

5. Dust proportion, report only

If the modified JMF is verified, the Engineer revises your *Hot Mix Asphalt Verification* form to include the new asphalt binder source. Your revised form will have the same expiration date as the original form.

If a modified JMF is not verified, stop production and any HMA placed using the modified JMF is rejected.

The Engineer deducts \$2,000 from payments for each modified JMF verification. The Engineer deducts an additional \$2,000 for each modified JMF verification that requires California Test 371.

Add to section 39-1.03:

01-20-12

39-1.03H Job Mix Formula Acceptance

You may start HMA production if:

1. The Engineer's review of the JMF shows compliance with the specifications.
2. The Department has verified the JMF within 12 months before HMA production.
3. The Engineer accepts the verified JMF.

Replace "3 days" in the 1st paragraph of section 39-1.04A with:

01-20-12

3 business days

Replace the 2nd sentence in the 2nd paragraph of section 39-1.04A with:

01-20-12

During production, take samples under California Test 125. You may sample HMA from:

Replace the 2nd paragraph of section 39-1.04E with:

02-22-13

For RAP substitution rate of 15 percent or less, sample RAP once daily.

For RAP substitution rate of greater than 15percent, sample processed RAP twice daily.

Perform QC testing for processed RAP aggregate gradation under California Test 367, appendix B, and submit the results with the combined aggregate gradation.

Replace "5 days" in the 1st paragraph of section 39-1.06 with:

01-20-12

5 business days

Replace the 3rd paragraph of section 39-1.08A with:

04-20-12

During production, you may adjust hot or cold feed proportion controls for virgin aggregate and RAP.

Add to section 39-1.08A:

04-20-12

During production, asphalt binder set point for HMA Type A, HMA Type B, HMA Type C, and RHMA-G must be the OBC shown in *Contractor Hot Mix Asphalt Design Data* form. For OGFC, asphalt binder set

point must be the OBC shown on *Caltrans Hot Mix Asphalt Verification* form. If RAP is used, asphalt binder set point for HMA must be calculated as specified in section 39-1.03E.

02-22-13

For RAP substitution rate of 15 percent or less, you may adjust the RAP by ± 5 percent.

For RAP substitution greater than 15, you may adjust the RAP by ± 3 percent.

04-20-12

You must request adjustments to the plant asphalt binder set point based on new RAP stockpiles average asphalt binder content. Do not adjust the HMA plant asphalt binder set point until authorized.

Replace the 3rd paragraph of section 39-1.08B with:

09-16-11

Asphalt rubber binder must be from 375 to 425 degrees F when mixed with aggregate.

Replace section 39-1.11 with:

01-18-13

39-1.11 CONSTRUCTION

39-1.11A General

Do not place HMA on wet pavement or a frozen surface.

You may deposit HMA in a windrow and load it in the paver if:

1. Paver is equipped with a hopper that automatically feeds the screed
2. Loading equipment can pick up the windrowed material and deposit it in the paver hopper without damaging base material
3. Activities for deposit, pickup, loading, and paving are continuous
4. HMA temperature in the windrow does not fall below 260 degrees F

You may place HMA in 1 or more layers on areas less than 5 feet wide and outside the traveled way, including shoulders. You may use mechanical equipment other than a paver for these areas. The equipment must produce uniform smoothness and texture.

HMA handled, spread, or windrowed must not stain the finished surface of any improvement, including pavement.

Do not use petroleum products such as kerosene or diesel fuel to release HMA from trucks, spreaders, or compactors.

HMA must be free of:

1. Segregation
2. Coarse or fine aggregate pockets
3. Hardened lumps

39-1.11B Longitudinal Joints

39-1.11B(1) General

Longitudinal joints in the top layer must match specified lane edges. Alternate the longitudinal joint offsets in the lower layers at least 0.5 foot from each side of the specified lane edges. You may request other longitudinal joint placement patterns.

A vertical longitudinal joint of more than 0.15 ft is not allowed at any time between adjacent lanes open to traffic.

For HMA thickness of 0.15 ft or less, the distance between the ends of the adjacent surfaced lanes at the end of each day's work must not be greater than can be completed in the following day of normal paving.

For HMA thickness greater than 0.15 ft, you must place HMA on adjacent traveled way lanes so that at the end of each work shift the distance between the ends of HMA layers on adjacent lanes is from 5 to 10 feet. Place additional HMA along the transverse edge at each lane's end and along the exposed longitudinal edges between adjacent lanes. Hand rake and compact the additional HMA to form temporary conforms. You may place Kraft paper or another authorized bond breaker under the conform tapers to facilitate the taper removal when paving operations resume.

39-1.11B(2) Tapered Notched Wedge

For divided highways with an HMA lift thickness greater than 0.15 foot, you may construct a 1-foot wide tapered notched wedge joint as a longitudinal joint between adjacent lanes open to traffic. A vertical notch of 0.75 inch maximum must be placed at the top and bottom of the tapered wedge.

The tapered notched wedge must retain its shape while exposed to traffic. Pave the adjacent lane within 1 day.

Construct the tapered portion of the tapered notched wedge with an authorized strike-off device. The strike-off device must provide a uniform slope and must not restrict the main screed of the paver.

You may use a device attached to the screed to construct longitudinal joints that will form a tapered notched wedge in a single pass. The tapered notched wedge must be compacted to a minimum of 91 percent compaction.

Perform QC testing on the completed tapered notch wedge joint as follows:

1. Perform field compaction tests at the rate of 1 test for each 750-foot section along the joint. Select random locations for testing within each 750-foot section.
2. Perform field compaction tests at the centerline of the joint, 6 inches from the upper vertical notch, after the adjacent lane is placed and before opening the pavement to traffic.
3. Determine maximum density test results.
4. Determine percent compaction of the longitudinal joint as the ratio of the average of the field compaction values and the maximum density test results.

For HMA under QC/QA construction process, the additional quality control compaction results associated with the tapered notch wedge will not be included in the computation of any quality factor and process control.

For acceptance of the completed tapered notch wedge joint, take two 4- or 6-inch diameter cores 6 inches from the upper vertical notch of the completed longitudinal joint for every 3,000 feet at locations designated by the Engineer. Take cores after the adjacent lane is placed and before opening the pavement to traffic. Cores must be taken in the presence of the Engineer and must be marked to identify the test sites. Submit the cores. One core will be used for determination of the field density and 1 core will be used for dispute resolution. The Engineer determines:

1. Field compaction by measuring the bulk specific gravity of the cores under California Test 308, Method A
2. Percent compaction as the ratio of the average of the bulk specific gravity of the core for each day's production to the maximum density test value

For HMA under QC/QA construction process, the additional quality assurance testing by the Engineer to determine field compaction associated with the tapered notch wedge will not be included in the Engineer's verification testing and in the computation of any quality factor and process control.

Determine percent compaction values each day the joint is completed and submit values within 24 hours of testing. If the percent compaction of 1 day's production is less than 91 percent, that day's notched wedge joint is rejected. Discontinue placement of the tapered notched wedge and notify the Engineer of changes you will make to your construction process in order to meet the specifications.

For HMA under QC/QA construction process, quantities of HMA placed in the completed longitudinal joint will have a quality factor QF_{QC5} of 1.0.

39-1.11C Widening Existing Pavement

If widening existing pavement, construct new pavement structure to match the elevation of the existing pavement's edge before placing HMA over the existing pavement.

39-1.11D Shoulders, Medians, and Other Road Connections

Until the adjoining through lane's top layer has been paved, do not pave the top layer of:

1. Shoulders
2. Tapers
3. Transitions
4. Road connections
5. Driveways
6. Curve widenings
7. Chain control lanes
8. Turnouts
9. Turn pockets

If the number of lanes changes, pave each through lane's top layer before paving a tapering lane's top layer. Simultaneous to paving a through lane's top layer, you may pave an adjoining area's top layer, including shoulders. Do not operate spreading equipment on any area's top layer until completing final compaction.

39-1.11E Leveling

If leveling with HMA is specified, fill and level irregularities and ruts with HMA before spreading HMA over the base, existing surfaces, or bridge decks. You may use mechanical equipment other than a paver for these areas. The equipment must produce uniform smoothness and texture. HMA used to change an existing surface's cross slope or profile is not paid for as HMA (leveling).

If placing HMA against the edge of existing pavement, sawcut or grind the pavement straight and vertical along the joint and remove extraneous material.

39-1.11F Compaction

Rolling must leave the completed surface compacted and smooth without tearing, cracking, or shoving. Complete finish rolling activities before the pavement surface temperature is:

1. Below 150 degrees F for HMA with unmodified binder
2. Below 140 degrees F for HMA with modified binder
3. Below 200 degrees F for RHMA-G

If a vibratory roller is used as a finish roller, turn the vibrator off.

Do not use a pneumatic-tired roller to compact RHMA-G.

For Standard and QC/QA construction processes, if 3/4-inch aggregate grading is specified, you may use a 1/2-inch aggregate grading if the specified total paved thickness is at least 0.15 foot and less than 0.20 foot thick.

Spread and compact HMA under sections 39-3.03 and 39-3.04 if any of the following applies:

1. Specified paved thickness is less than 0.15 foot.
2. Specified paved thickness is less than 0.20 foot and 3/4-inch aggregate grading is specified and used.
3. You spread and compact at:
 - 3.1. Asphalt concrete surfacing replacement areas
 - 3.2. Leveling courses
 - 3.3. Areas for which the Engineer determines conventional compaction and compaction measurement methods are impeded

Do not open new HMA pavement to public traffic until its mid-depth temperature is below 160 degrees F.

If you request and if authorized, you may cool HMA Type A and Type B with water when rolling activities are complete. Apply water under section 17-3.

Spread sand at a rate from 1 to 2 lb/sq yd on new RHMA-G, RHMA-O, and RHMA-O-HB pavement when finish rolling is complete. Sand must be free of clay or organic matter. Sand must comply with section 90-1.02C(4)(c). Keep traffic off the pavement until spreading sand is complete.

Replace the 5th and 6th paragraphs of section 39-1.12C with:

07-20-12

On tangents and horizontal curves with a centerline radius of curvature 2,000 feet or more, the PI_0 must be at most 2.5 inches per 0.1-mile section.

On horizontal curves with a centerline radius of curvature between 1,000 feet and 2,000 feet including pavement within the superelevation transitions, the PI_0 must be at most 5 inches per 0.1-mile section.

Add to section 39-1.12:

01-20-12

39-1.12E Reserved

Add to section 39-1.14:

01-20-12

Prepare the area to receive HMA for miscellaneous areas and dikes, including any excavation and backfill as needed.

Replace "6.8" in item 3 in the list in the 4th paragraph of section 39-1.14 with:

04-20-12

6.4

Replace "6.0" in item 3 in the list in the 4th paragraph of section 39-1.14 with:

04-20-12

5.7

Replace "6.8" in the 1st paragraph of section 39-1.15B with:

04-20-12

6.4

Replace "6.0" in the 1st paragraph of section 39-1.15B with:

04-20-12

5.7

Replace the 1st paragraph of section 39-2.02B with:

02-22-13

Perform sampling and testing at the specified frequency for the quality characteristics shown in the following table:

Minimum Quality Control—Standard Construction Process

Quality characteristic	Test method	Minimum sampling and testing frequency	HMA type			
			A	B	RHMA-G	OGFC
Aggregate gradation ^a	California Test 202	1 per 750 tons and any remaining part at the end of the project	JMF ± Tolerance ^b			
Sand equivalent (min) ^c	California Test 217		47	42	47	--
Asphalt binder content (%)	California Test 379 or 382		JMF±0.40	JMF±0.40	JMF ± 0.40	JMF ± 0.40
HMA moisture content (% max)	California Test 226 or 370	1 per 2,500 tons but not less than 1 per paving day	1.0	1.0	1.0	1.0
Field compaction (% max. theoretical density) ^{d,e}	QC plan	2 per business day (min.)	91–97	91–97	91–97	--
Stabilometer value (min) ^c No. 4 and 3/8" gradings 1/2" and 3/4" gradings	California Test 366	1 per 4,000 tons or 2 per 5 business days, whichever is greater	30	30	--	--
			37	35	23	--
Air void content (%) ^{c,f}	California Test 367		4 ± 2	4 ± 2	TV ± 2	--
Aggregate moisture content at continuous mixing plants and RAP moisture content at continuous mixing plants and batch mixing plants ^g	California Test 226 or 370	2 per day during production	--	--	--	--
Percent of crushed particles coarse aggregate (% min) One fractured face Two fractured faces Fine aggregate (% min) (Passing no. 4 sieve and retained on no. 8 sieve.) One fractured face	California Test 205	As designated in the QC plan. At least once per project	90	25	--	90
			75	--	90	75
Los Angeles Rattler (% max) Loss at 100 rev.	California Test 211		70	20	70	90
			12	--	12	12

Loss at 500 rev.			45	50	40	40
Flat and elongated particles (% max by weight @ 5:1)	California Test 235		Report only	Report only	Report only	Report only
Fine aggregate angularity (% min) ^h	California Test 234		45	45	45	--
Voids filled with asphalt (%) ⁱ No. 4 grading 3/8" grading 1/2" grading 3/4" grading	California Test 367		65.0–75.0 65.0–75.0 65.0–75.0 65.0–75.0	65.0–75.0 65.0–75.0 65.0–75.0 65.0–75.0	Report only	--
Voids in mineral aggregate (% min) ⁱ No. 4 grading 3/8" grading 1/2" grading 3/4" grading	California Test 367		17.0 15.0 14.0 13.0	17.0 15.0 14.0 13.0	-- -- 18.0–23.0 18.0–23.0	--
Dust proportion ^l No. 4 and 3/8" gradings 1/2" and 3/4" gradings	California Test 367		0.6-1.2 0.6–1.2	0.6-1.2 0.6–1.2	Report only	--
Hamburg wheel track (minimum number of passes at 0.5 inch average rut depth) ^j PG-58 PG-64 PG-70 PG-76 or higher	AASHTO T 324 (Modified)	1 per 10,000 tons or 1 per project whichever is more	10,000 15,000 20,000 25,000	10,000 15,000 20,000 25,000	--	--
Hamburg wheel track (inflection point minimum number of passes) ^j PG-58 PG-64 PG-70 PG-76 or higher	AASHTO T 324 (Modified)	1 per 10,000 tons or 1 per project whichever is more	10,000 10,000 12,500 15000	10,000 10,000 12,500 15000	--	--
Moisture susceptibility (minimum dry strength, psi) ^j	California Test 371	For RAP ≥15% 1 per 10,000 tons or 1 per project whichever is greater	120	120	--	--
Moisture susceptibility (tensile strength ratio, %) ^j	California Test 371	For RAP ≥15% 1 per 10,000 tons or 1	70	70	--	--

		per project whichever is greater				
Smoothness	Section 39-1.12	--	12-foot straight- edge, must grind, and PI ₀			
Asphalt rubber binder viscosity @ 375 °F, centipoises	Section 39-1.02D	Section 39-1.04C	--	--	1,500– 4,000	1,500– 4,000
Asphalt modifier	Section 39-1.02D	Section 39-1.04C	--	--	Section 39-1.02D	Section 39-1.02D
CRM	Section 39-1.02D	Section 39-1.04C	--	--	Section 39-1.02D	Section 39-1.02D

^a Determine combined aggregate gradation containing RAP under California Test 367.

^b The tolerances must comply with the allowable tolerances in section 39-1.02E.

^c Report the average of 3 tests from a single split sample.

^d Determine field compaction for any of the following conditions:

1. 1/2-inch, 3/8-inch, or no. 4 aggregate grading is used and the specified total paved thickness is at least 0.15 foot.
2. 3/4-inch aggregate grading is used and the specified total paved thickness is at least 0.20 foot.

^e To determine field compaction use:

1. In-place density measurements using the method specified in your QC plan.
2. California Test 309 to determine the maximum theoretical density at the frequency specified in California Test 375, Part 5C.

^f Determine the bulk specific gravity of each lab-compacted briquette under California Test 308, Method A, and theoretical maximum specific gravity under California Test 309.

^g For adjusting the plant controller at the HMA plant.

^h The Engineer waives this specification if HMA contains 10 percent or less of nonmanufactured sand by weight of total aggregate. Manufactured sand is fine aggregate produced by crushing rock or gravel.

ⁱ Report only.

^j Applies to RAP substitution rate greater than 15 percent.

Replace the 1st paragraph of section 39-2.03A with:

02-22-13

The Department samples for acceptance testing and tests for the quality characteristics shown in the following table:

HMA Acceptance—Standard Construction Process

Quality characteristic	Test method	HMA type							
		A	B	RHMA-G	OGFC				
Aggregate gradation ^a	California Test 202	JMF ± tolerance ^c							
Sieve						3/4"	1/2"	3/8"	
1/2"						X ^b			
3/8"							X		
No. 4								X	
No. 8						X	X	X	
No. 200	X	X	X						
Sand equivalent (min) ^d	California Test 217	47	42	47	--				
Asphalt binder content (%)	California Test 379 or 382	JMF±0.40	JMF±0.40	JMF ± 0.40	JMF ± 0.40				
HMA moisture content (% max)	California Test 226 or 370	1.0	1.0	1.0	1.0				
Field compaction (% max. theoretical density) ^{e, f}	California Test 375	91–97	91–97	91–97	--				
Stabilometer value (min) ^g	California Test 366	30	30	--	--				
No. 4 and 3/8" gradings									
1/2" and 3/4" gradings									
Air void content (%) ^{d, g}	California Test 367	4 ± 2	4 ± 2	TV ± 2	--				
Percent of crushed particles	California Test 205								
Coarse aggregate (% min)									
One fractured face						90	25	--	90
Two fractured faces						75	--	90	75
Fine aggregate (% min)									
(Passing no. 4 sieve and retained on no. 8 sieve.)									
One fractured face	70	20	70	90					
Los Angeles Rattler (% max)	California Test 211	12	--	12	12				
Loss at 100 rev.									
Loss at 500 rev.		45	50	40	40				
Fine aggregate angularity (% min) ^h	California Test 234	45	45	45	--				
Flat and elongated particles (% max by weight @ 5:1)	California Test 235	Report only	Report only	Report only	Report only				
Voids filled with asphalt (%) ⁱ	California Test 367	65.0–75.0	65.0–75.0	Report only	--				
No. 4 grading									
3/8" grading									
1/2" grading									
3/4" grading									
Voids in mineral aggregate (% min) ⁱ	California Test 367	17.0	17.0	--	--				
No. 4 grading									
3/8" grading									
1/2" grading						14.0	14.0	18.0–23.0	
3/4" grading						13.0	13.0	18.0–23.0	
Dust proportion ⁱ	California			Report only	--				

No. 4 and 3/8" gradings 1/2" and 3/4" gradings	Test 367	0.6-1.2 0.6-1.2	0.6-1.2 0.6-1.2		
Hamburg wheel track (minimum number of passes at 0.5 inch average rut depth) ^j PG-58 PG-64 PG-70 PG-76 or higher	AASHTO T 324 (Modified)	10,000 15,000 20,000 25,000	10,000 15,000 20,000 25,000	--	--
Hamburg wheel track (inflection point minimum number of passes) ^j PG-58 PG-64 PG-70 PG-76 or higher	AASHTO T 324 (Modified)	10,000 10,000 12,500 15000	10,000 10,000 12,500 15000	--	--
Moisture susceptibility (minimum dry strength, psi) ^j	California Test 371	120	120	--	--
Moisture susceptibility (tensile strength ration, %) ^j	California Test 371	70	70	--	--
Smoothness	Section 39-1.12	12-foot straight- edge, must grind, and PI ₀	12-foot straight- edge, must grind, and PI ₀	12-foot straight- edge, must grind, and PI ₀	12-foot straight- edge and must grind
Asphalt binder	Various	Section 92	Section 92	Section 92	Section 92
Asphalt rubber binder	Various	--	--	Section 92- 1.01D(2) and section 39-1.02D	Section 92-1.01D(2) and section 39-1.02D
Asphalt modifier	Various	--	--	Section 39-1.02D	Section 39-1.02D
CRM	Various	--	--	Section 39-1.02D	Section 39-1.02D

^a The Engineer determines combined aggregate gradations containing RAP under California Test 367.

^b "X" denotes the sieves the Engineer tests for the specified aggregate gradation.

^c The tolerances must comply with the allowable tolerances in section 39-1.02E.

^d The Engineer reports the average of 3 tests from a single split sample.

^e The Engineer determines field compaction for any of the following conditions:

1. 1/2-inch, 3/8-inch, or no. 4 aggregate grading is used and the specified total paved thickness is at least 0.15 foot.
2. 3/4-inch aggregate grading is used and the specified total paved thickness is at least 0.20 foot.

^f To determine field compaction, the Engineer uses:

1. California Test 308, Method A, to determine in-place density of each density core.
2. California Test 309 to determine the maximum theoretical density at the frequency specified in California Test 375, Part 5C.

^g The Engineer determines the bulk specific gravity of each lab-compacted briquette under California Test 308, Method A, and theoretical maximum specific gravity under California Test 309.

^h The Engineer waives this specification if HMA contains 10 percent or less of nonmanufactured sand by weight of total aggregate. Manufactured sand is fine aggregate produced by crushing rock or gravel.

ⁱ Report only.

^j Applies to RAP substitution rate greater than 15 percent.

Replace the 5th paragraph of section 39-2.03A with:

01-20-12

The Engineer determines the percent of maximum theoretical density from density cores taken from the final layer measured the full depth of the total paved HMA thickness if any of the following applies:

1. 1/2-inch, 3/8-inch, or no. 4 aggregate grading is used and the specified total paved thickness is at least 0.15 foot and any layer is less than 0.15 foot.
2. 3/4-inch aggregate grading is used and the specified total paved thickness is at least 0.2 foot and any layer is less than 0.20 foot.

Replace the 1st paragraph of section 39-3.02A with:

02-22-13

The Department samples for acceptance testing and tests for the quality characteristics shown in the following table:

HMA Acceptance—Method Construction Process

Quality characteristic	Test method	HMA type			
		A	B	RHMA-G	OGFC
Aggregate gradation ^a	California Test 202	JMF ± tolerance ^b			
Sand equivalent (min) ^c	California Test 217	47	42	47	--
Asphalt binder content (%)	California Test 379 or 382	JMF±0.40	JMF±0.40	JMF ± 0.40	JMF ± 0.40
HMA moisture content (% max)	California Test 226 or 370	1.0	1.0	1.0	1.0
Stabilometer value (min) ^c No. 4 and 3/8" gradings 1/2" and 3/4" gradings	California Test 366	30	30	--	--
		37	35	23	--
Percent of crushed particles Coarse aggregate (% min) One fractured face Two fractured faces Fine aggregate (% min) (Passing no. 4 sieve and retained on no. 8 sieve.) One fractured face	California Test 205	90	25	--	90
		75	--	90	75
		70	20	70	90
Los Angeles Rattler (% max) Loss at 100 rev. Loss at 500 rev.	California Test 211	12	--	12	12
		45	50	40	40
Air void content (%) ^{c, d}	California Test 367	4 ± 2	4 ± 2	TV ± 2	--
Fine aggregate angularity (% min) ^e	California Test 234	45	45	45	--
Flat and elongated particles (% max by weight @ 5:1)	California Test 235	Report only	Report only	Report only	Report only
Voids filled with asphalt (%) ^f No. 4 grading 3/8" grading 1/2" grading 3/4" grading	California Test 367	65.0–75.0	65.0–75.0	Report only	--
		65.0–75.0	65.0–75.0		
		65.0–75.0	65.0–75.0		
		65.0–75.0	65.0–75.0		
Voids in mineral aggregate (% min) ^f No. 4 grading 3/8" grading 1/2" grading 3/4" grading	California Test 367	17.0	17.0	--	--
		15.0	15.0	--	--
		14.0	14.0	18.0–23.0	--
		13.0	13.0	18.0–23.0	--
Dust proportion ^g No. 4 and 3/8" gradings 1/2" and 3/4" gradings	California Test 367	0.6–1.2	0.6–1.2	Report only	--
		0.6–1.2	0.6–1.2		
Hamburg wheel track (minimum number of passes at 0.5 inch average rut depth) ^g PG-58 PG-64	AASHTO T 324 (Modified)	10,000	10,000	--	--
		15,000	15,000		

PG-70 PG-76 or higher		20,000 25,000	20,000 25,000		
Hamburg wheel track (inflection point minimum number of passes) ^g	AASHTO T 324 (Modified)			--	--
PG-58		10,000	10,000		
PG-64		10,000	10,000		
PG-70		12,500	12,500		
PG-76 or higher		15000	15000		
Moisture susceptibility (minimum dry strength, psi) ^g	California Test 371	120	120	--	--
Moisture susceptibility (tensile strength ration, %) ^g	California Test 371	70	70	--	--
Smoothness	Section 39-1.12	12-foot straight- edge and must-grind	12-foot straight- edge and must-grind	12-foot straight- edge and must-grind	12-foot straight- edge and must-grind
Asphalt binder	Various	Section 92	Section 92	Section 92	Section 92
Asphalt rubber binder	Various	--	--	Section 92- 1.01D(2) and section 39-1.02D	Section 92- 1.01D(2) and section 39-1.02D
Asphalt modifier	Various	--	--	Section 39-1.02D	Section 39-1.02D
CRM	Various	--	--	Section 39-1.02D	Section 39-1.02D

^a The Engineer determines combined aggregate gradations containing RAP under California Test 367.

^b The tolerances must comply with the allowable tolerances in section 39-1.02E.

^c The Engineer reports the average of 3 tests from a single split sample.

^d The Engineer determines the bulk specific gravity of each lab-compacted briquette under California Test 308, Method A, and theoretical maximum specific gravity under California Test 309.

^e The Engineer waives this specification if HMA contains 10 percent or less of nonmanufactured sand by weight of total aggregate. Manufactured sand is fine aggregate produced by crushing rock or gravel.

^f Report only.

^g Applies to RAP substitution rate greater than 15 percent.

Replace "280 degrees F" in item 2 in the list in the 6th paragraph of section 39-3.04 with:

285 degrees F

01-20-12

Replace "5,000" in the 5th paragraph of section 39-4.02C with:

10,000

02-22-13

Replace the 7th paragraph of section 39-4.02C with:

Except for RAP substitution rate of greater than 15 percent, the Department does not use results from California Test 371 to determine specification compliance.

02-22-13

Replace the 8th paragraph of section 39-4.02C with:

02-22-13

Comply with the values for the HMA quality characteristics and minimum random sampling and testing for quality control shown in the following table:

Minimum Quality Control—QC/QA Construction Process

Quality characteristic	Test method	Minimum sampling and testing frequency	HMA Type			Location of sampling	Maximum report-ing time allow-ance
			A	B	RHMA-G		
Aggregate gradation ^a	California Test 202	1 per 750 tons	JMF ± tolerance ^b	JMF ± tolerance ^b	JMF ± tolerance ^b	California Test 125	24 hours
Asphalt binder content (%)	California Test 379 or 382		JMF±0.40	JMF±0.40	JMF ±0.40	Loose mix behind paver See California Test 125	
Field compaction (% max. theoretical density) ^{c,d}	QC plan		92–96	92–96	91–96	QC plan	
Aggregate moisture content at continuous mixing plants and RAP moisture content at continuous mixing plants and batch mixing plants ^e	California Test 226 or 370	2 per day during production	--	--	--	Stock-piles or cold feed belts	--
Sand equivalent (min) ^f	California Test 217	1 per 750 tons	47	42	47	California Test 125	24 hours
HMA moisture content (% max)	California Test 226 or 370	1 per 2,500 tons but not less than 1 per paving day	1.0	1.0	1.0	Loose Mix Behind Paver See California Test 125	24 hours
Stabilometer value (min) ^f	California Test 366	1 per 4,000 tons or 2 per 5 business days, whichever is greater	30	30	--		48 hours
No. 4 and 3/8" gradings 1/2" and 3/4" gradings			37	35	23		
Air void content (%) ^{f,g}	California Test 367		4 ± 2	4 ± 2	TV ± 2		

Percent of crushed particles coarse aggregate (% min.): One fractured face Two fractured faces	California Test 205	As designated in QC plan. At least once per project.	90	25	--	California Test 125	48 hours
			75	--	90		
Fine aggregate (% min) (Passing no. 4 sieve and retained on no. 8 sieve): One fractured face			70	20	70		
Los Angeles Rattler (% max): Loss at 100 rev. Loss at 500 rev.	California Test 211		12	--	12	California Test 125	
			45	50	40		
Fine aggregate angularity (% min) ⁿ	California Test 234		45	45	45	California Test 125	
Flat and elongated particle (% max by weight @ 5:1)	California Test 235		Report only	Report only	Report only	California Test 125	
Voids filled with asphalt (%) ⁱ No. 4 grading 3/8" grading 1/2" grading 3/4" grading	California Test 367				Report only		
			65.0–75.0	65.0–75.0			
		65.0–75.0	65.0–75.0				
		65.0–75.0	65.0–75.0				
		65.0–75.0	65.0–75.0				
Voids in mineral aggregate (% min.) ⁱ No. 4 grading 3/8" grading 1/2" grading 3/4" grading	California Test 367						
		17.0	17.0	--			
		15.0	15.0	--			
		14.0	14.0	18.0–23.0			
		13.0	13.0	18.0–23.0			

Dust proportion ⁱ 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) ⁱ 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) ⁱ 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) ⁱ	California Test 371	1 per 10,000 tons or 1 per project whichever is greater	120	120	--	--	
Moisture susceptibility (tensile strength ratio, %) ^j	California Test 371	1 per 10,000 tons or 1 per project whichever is greater	70	70	70	--	
Smoothness	Section 39-1.12	--	12-foot straight-edge, must-grind, and PI ₀	12-foot straight-edge, must-grind, and PI ₀	12-foot straight-edge, must-grind, and PI ₀	--	
Asphalt rubber binder viscosity @ 375 °F, centipoises	Section 39-1.02D	--	--	--	1,500–4,000	Section 39-1.02D	24 hours
CRM	Section 39-1.02D	--	--	--	Section 39-1.02D	Section 39-1.02D	48 hours

- ^a Determine combined aggregate gradation containing RAP under California Test 367.
- ^b The tolerances must comply with the allowable tolerances in section 39-1.02E.
- ^c Determines field compaction for any of the following conditions:
 1. 1/2-inch, 3/8-inch, or no. 4 aggregate grading is used and the specified total paved thickness is at least 0.15 foot.
 2. 3/4-inch aggregate grading is used and the specified total paved thickness is at least 0.20 foot.
- ^d To determine field compaction use:
 1. In-place density measurements using the method specified in your QC plan.
 2. California Test 309 to determine the maximum theoretical density at the frequency specified in California Test 375, Part 5C.
- ^e For adjusting the plant controller at the HMA plant.
- ^f Report the average of 3 tests from a single split sample.
- ^g Determine the bulk specific gravity of each lab-compacted briquette under California Test 308, Method A, and theoretical maximum specific gravity under California Test 309.
- ^h The Engineer waives this specification if HMA contains 10 percent or less of nonmanufactured sand by weight of total aggregate. Manufactured sand is fine aggregate produced by crushing rock or gravel.
- ⁱ Report only.
- ^j Applies to RAP substitution rate greater than 15 percent.

Replace the 1st sentence in the 1st paragraph of section 39-4.03B(2) with:

01-20-12

For aggregate gradation and asphalt binder content, the minimum ratio of verification testing frequency to quality control testing frequency is 1:5.

Replace the 2nd "and" in the 7th paragraph of section 39-4.03B(2) with:

01-20-12

or

Replace the 1st paragraph of section 39-4.04A with:

02-22-13

The Engineer samples for acceptance testing and tests for the following quality characteristics:

HMA Acceptance—QC/QA Construction Process

Index (i)	Quality characteristic				Weight -ing factor (w)	Test method	HMA type		
							A	B	RHMA-G
		Aggregate gradation ^a				California Test 202	JMF ± Tolerance ^c		
	Sieve	3/4"	1/2"	3/8"					
1	1/2"	X ^b	--	--	0.05				
1	3/8"	--	X	--	0.05				
1	No. 4	--	--	X	0.05				
2	No. 8	X	X	X	0.10				
3	No. 200	X	X	X	0.15				
4	Asphalt binder content (%)				0.30	California Test 379 or 382	JMF±0.40	JMF±0.40	JMF ± 0.40
5	Field compaction (% max. theoretical density) ^{d, e}				0.40	California Test 375	92–96	92–96	91–96
	Sand equivalent (min) ^f					California Test 217	47	42	47
	Stabilometer value (min) ^f No. 4 and 3/8" gradings 1/2" and 3/4" gradings					California Test 366	30 37	30 35	-- 23
	Air void content (%) ^{f, g}					California Test 367	4 ± 2	4 ± 2	TV ± 2
	Percent of crushed particles coarse aggregate (% min) One fractured face Two fractured faces Fine aggregate (% min) (Passing no. 4 sieve and retained on No. 8 sieve.) One fractured face					California Test 205	90 75	25 --	-- 90
	HMA moisture content (% max)					California Test 226 or 370	1.0	1.0	1.0
	Los Angeles Rattler (% max) Loss at 100 rev. Loss at 500 rev.					California Test 211	12 45	-- 50	12 40
	Fine aggregate angularity (% min) ^h					California Test 234	45	45	45
	Flat and elongated particle (% max by weight @ 5:1)					California Test 235	Report only	Report only	Report only
	Voids in mineral aggregate (% min) ⁱ No. 4 grading 3/8" grading 1/2" grading 3/4" grading					California Test 367	17.0 15.0 14.0 13.0	17.0 15.0 14.0 13.0	-- -- 18.0–23.0 18.0–23.0

	Voids filled with asphalt (%) ⁱ No. 4 grading 3/8" grading 1/2" grading 3/4" grading		California Test 367	65.0–75.0 65.0–75.0 65.0–75.0 65.0–75.0	65.0–75.0 65.0–75.0 65.0–75.0 65.0–75.0	Report only
	Dust proportion ¹ No. 4 and 3/8" gradings 1/2" and 3/4" gradings		California Test 367	0.6–1.2 0.6–1.2	0.6–1.2 0.6–1.2	Report only
	Hamburg Wheel Tracker (minimum number of passes at 0.5 inch average rut depth) ^j PG-58 PG-64 PG-70 PG-76 or higher		AASHTO T 324 (Modified)	10,000 15,000 20,000 25,000	10,000 15,000 20,000 25,000	--
	Hamburg Wheel Tracker (inflection point minimum number of passes) ^j PG-58 PG-64 PG-70 PG-76 or higher		AASHTO T 324 (Modified)	10,000 15,000 20,000 25,000	10,000 15,000 20,000 25,000	--
	Moisture susceptibility (minimum dry strength, psi) ^j		California Test 371	120	120	--
	Moisture susceptibility (tensile strength ratio %) ^j		California Test 371	70	70	70
	Smoothness		Section 39-1.12	12-foot straight- edge, must grind, and PI ₀	12-foot straight- edge, must grind, and PI ₀	12-foot straight- edge, must grind, and PI ₀
	Asphalt binder		Various	Section 92	Section 92	Section 92
	Asphalt rubber binder		Various	--	--	Section 92-1.01D(2) and section 39-1.02D
	Asphalt modifier		Various	--	--	Section 39-1.02D
	CRM		Various	--	--	Section 39-1.02D

Replace the 2nd and 3rd paragraphs in section 40-1.01D(4) with:

01-20-12

The QC plan must include details of corrective action to be taken if any process is out of control. As a minimum, a process is out of control if any of the following occurs:

1. For fine and coarse aggregate gradation, 2 consecutive running averages of 4 tests are outside the specification limits
2. For individual penetration or air content measurements:
 - 2.1. One point falls outside the suspension limit line
 - 2.2. Two points in a row fall outside the action limit line

Stop production and take corrective action for out of control processes or the Engineer rejects subsequent material.

Replace the 1st paragraph in section 40-1.01D(5) with:

01-20-12

Determine the minimum cementitious materials content. Use your value for minimum cementitious material content for *MC* in equation 1 and equation 2 of section 90-1.02B(3).

Replace the 1st sentence of the 3rd paragraph of section 40-1.01D(9) with:

01-20-12

Use a California profilograph to determine the concrete pavement profile.

Replace the title of the table in section 40-1.01D(13)(a) with:

01-20-12

Concrete Pavement Acceptance Testing

Replace the 2nd and 3rd paragraphs in section 40-1.01D(13)(a) with:

01-20-12

Pavement smoothness may be accepted based on the Department's testing. A single test represents no more than 0.1 mile.

Acceptance of modulus of rupture, thickness, dowel bar and tie bar placement, coefficient of friction, smoothness, and air content, does not constitute final concrete pavement acceptance.

Delete item 4 in the list in the 2nd paragraph in section 40-1.01D(13)(c)(2).

01-20-12

Replace items 1 and 2 in the list in the 2nd paragraph in 40-1.01D(13)(d) with:

01-20-12

1. For tangents and horizontal curves having a centerline radius of curvature 2,000 feet or more, the PI_0 must be at most 2-1/2 inches per 0.1-mile section.
2. For horizontal curves having a centerline radius of curvature from 1,000 to 2,000 feet including concrete pavement within the superelevation transitions of those curves, the PI_0 must be at most 5 inches per 0.1-mile section.

Replace the 1st and 2nd variables in the equation in section 40-1.01D(13)(f) with:

01-20-12

n_c = Number of your quality control tests (minimum of 6 required)

n_v = Number of verification tests (minimum of 2 required)

Replace "Your approved third party independent testing laboratory" in the 4th paragraph of section 40-1.01D(13)(f) with:

01-20-12

The authorized laboratory

Replace item 2 in the list in the 2nd paragraph of section 40-1.01D(13)(g):

01-20-12

2. One test for every 4,000 square yards of concrete pavement with tie bars or remaining fraction of that area. Each tie bar test consists of 2 cores with 1 on each tie-bar-end to expose both ends and allow measurement.

Replace section 40-1.01D(13)(h) with:

01-20-12

40-1.01D(13)(h) Bar Reinforcement

Bar reinforcement is accepted based on inspection before concrete placement.

Replace the paragraph in section 40-1.02B(2) with:

01-20-12

PCC for concrete pavement must comply with section 90-1 except as otherwise specified.

Replace the paragraphs in section 40-1.02D with:

01-20-12

Bar reinforcement must be deformed bars.

If the project is not shown to be in high desert or any mountain climate region, bar reinforcement must comply with section 52.

If the project is shown to be in high desert or any mountain climate regions, bar reinforcement must be one of the following:

1. Epoxy-coated bar reinforcement under section 52-2.03B except bars must comply with either ASTM A 706/A 706M; ASTM A 996/A 996M; or ASTM A 615/A 615M, Grade 40 or 60. Bars must be handled under ASTM D 3963/D 3963M and section 52-2.02C.
2. Low carbon, chromium steel bar complying with ASTM A 1035/A 1035M

Replace the paragraphs in section 40-1.02E with:

01-20-12

Tie bars must be deformed bars.

If the project is not shown to be in high desert or any mountain climate region, tie bars must be one of the following:

1. Epoxy-coated bar reinforcement. Bars must comply with either section 52-2.02B or 52-2.03B except bars must comply with either ASTM A 706/A 706M; ASTM A 996/A 996M; or ASTM A 615/A 615M, Grade 40 or 60.
2. Stainless-steel bars. Bars must be descaled, pickled, polished, and solid stainless-steel bars under ASTM A 955/A 955M, Grade 60, UNS Designation S31603 or S31803.
3. Low carbon, chromium-steel bars under ASTM A 1035/A 1035M.

If the project is shown to be in high desert or any mountain climate region, tie bars must be one of the following:

1. Epoxy-coated bar reinforcement. Bars must comply with section 52-2.03B except bars must comply with either ASTM A 706/A 706M; ASTM A 996/A 996M; or ASTM A 615/A 615M, Grade 40 or 60.
2. Stainless-steel bars. Bars must be descaled, pickled, polished, and solid stainless-steel bars under ASTM A 955/A 955M, Grade 60, UNS Designation S31603 or S31803.

Fabricate, sample, and handle epoxy-coated tie bars under ASTM D 3963/D 3963M, section 52-2.02C, or section 52-2.03C.

Do not bend tie bars.

Replace the 1st, 2nd, and 3rd paragraphs in section 40-1.02F with:

01-20-12

Dowel bars must be plain bars. Fabricate, sample, and handle epoxy-coated dowel bars under ASTM D 3963/D 3963M and section 52-2.03C except each sample must be 18 inches long.

If the project is not shown to be in high desert or any mountain climate region, dowel bars must be one of the following:

1. Epoxy-coated bars. Bars must comply with ASTM A 615/A 615M, Grade 40 or 60. Epoxy coating must comply with either section 52-2.02B or 52-2.03B.
2. Stainless-steel bars. Bars must be descaled, pickled, polished, and solid stainless-steel bars under ASTM A 955/A 955M, Grade 60, UNS Designation S31603 or S31803.
3. Low carbon, chromium-steel bars under ASTM A 1035/A 1035M.

If the project is shown to be in high desert or any mountain climate region, dowel bars must be one of the following:

1. Epoxy-coated bars. Bars must comply with ASTM A 615/A 615M, Grade 40 or 60. Epoxy coating must comply with section 52-2.03B.
2. Stainless-steel bars. Bars must be descaled, pickled, polished, and solid stainless-steel bars under ASTM A 955/A 955M, Grade 60, UNS Designation S31603 or S31803.

Replace the paragraphs in section 40-1.02G with:

01-20-12

For dowel and tie bar baskets, wire must comply with ASTM A 82/A 82M and be welded under ASTM A 185/A 185M, Section 7.4. The minimum wire-size no. is W10. Use either U-frame or A-frame shaped assemblies.

If the project is not shown to be in high desert or any mountain climate region. Baskets may be epoxy-coated, and the epoxy coating must comply with either section 52-2.02B or 52-2.03B.

If the project is shown to be in high desert or any mountain climate region, wire for dowel bar and tie bar baskets must be one of the following:

1. Epoxy-coated wire complying with section 52-2.03B
2. Stainless-steel wire. Wire must be descaled, pickled, and polished solid stainless-steel. Wire must comply with (1) the chemical requirements in ASTM A 276/A 276M, UNS Designation S31603 or S31803 and (2) the tension requirements in ASTM A 1022/ A 1022M.

Handle epoxy-coated tie bar and dowel bar baskets under ASTM D 3963/D 3963M and either section 52-2.02B or 52-2.03B.

Fasteners must be driven fasteners under ASTM F 1667. Fasteners on lean concrete base or HMA must have a minimum shank diameter of 3/16 inch and a minimum shank length of 2-1/2 inches. For asphalt

treated permeable base or cement treated permeable base, the shank diameter must be at least 3/16 inch and the shank length must be at least 5 inches.

Fasteners, clips, and washers must have a minimum 0.2-mil thick zinc coating applied by either electroplating or galvanizing.

Replace the 1st paragraph in section 40-1.02H with:

01-20-12

Chemical adhesive for drilling and bonding dowels and tie bars must be on the Authorized Material List. The Authorized Material List indicates the appropriate chemical adhesive system for the concrete temperature and installation conditions.

Replace section 40-1.02I(2) with:

01-20-12

40-1.02I(2) Silicone Joint Sealant

Silicone joint sealant must be on the Authorized Material List.

Replace the last sentence in section 40-1.02I(4) with:

01-20-12

Show evidence that the seals are compressed from 30 to 50 percent for the joint width at time of installation.

Replace the paragraph in section 40-1.02L with:

01-20-12

Water for core drilling may be obtained from a potable water source, or submit proof that it does not contain:

1. More than 1,000 parts per million of chlorides as Cl
2. More than 1,300 parts per million of sulfates as SO_4
3. Impurities that cause pavement discoloration or surface etching

Replace the paragraph in section 40-1.03B with:

01-20-12

Before placing concrete pavement, develop enough water supply for the work under section 17.

Replace the last paragraph in section 40-1.03D(1) with:

01-20-12

Removal of grinding residue must comply with section 42-1.03B.

Replace the 1st and 2nd paragraphs in section 40-1.03E(6)(c) with:

01-20-12

Install preformed compressions seals in isolation joints if specified in the special provisions.

Install longitudinal seals before transverse seals. Longitudinal seals must be continuous except splicing is allowed at intersections with transverse seals. Transverse seals must be continuous for the entire transverse length of concrete pavement except splices are allowed for widenings and staged construction. With a sharp instrument, cut across the longitudinal seal at the intersection with transverse

construction joints. If the longitudinal seal does not relax enough to properly install the transverse seal, trim the longitudinal seal to form a tight seal between the 2 joints.

If splicing is authorized, splicing must comply with the manufacturer's written instructions.

Replace the 12th and 13th paragraphs in section 40-1.03G with:

01-20-12

Construct additional test strips if you:

1. Propose different paving equipment including:
 - 1.1. Paver
 - 1.2. Dowel bar inserter
 - 1.3. Tie bar inserter
 - 1.4. Tining
 - 1.5. Curing equipment
2. Change concrete mix proportions

You may request authorization to eliminate the test strip if you use paving equipment and personnel from a Department project (1) for the same type of pavement and (2) completed within the past 12 months. Submit supporting documents and previous project information with your request.

Replace the 1st paragraph in section 40-1.03I with:

01-20-12

Place tie bars in compliance with the tolerances shown in the following table:

Tie Bar Tolerance	
Dimension	Tolerance
Horizontal and vertical skew	10 degrees maximum
Longitudinal translation	± 2 inch maximum
Horizontal offset (embedment)	± 2 inch maximum
Vertical depth	1. Not less than 1/2 inch below the saw cut depth of joints 2. When measured at any point along the bar, not less than 2 inches clear of the pavement's surface and bottom

Replace item 4 in the list in the 2nd paragraph in section 40-1.03I with:

01-20-12

4. Use tie bar baskets. Anchor baskets at least 200 feet in advance of pavement placement activity. If you request a waiver, describe the construction limitations or restricted access preventing the advanced anchoring. After the baskets are anchored and before paving, demonstrate the tie bars do not move from their specified depth and alignment during paving. Use fasteners to anchor tie bar baskets.

Replace "The maximum distance below the depth shown must be 0.05 foot." in the table in section 40-1.03J with:

01-20-12

The maximum distance below the depth shown must be 5/8 inch.

Replace sections 40-1.03L and 40-1.03M with:

01-20-12

40-1.03L Finishing

40-1.03L(1) General

Reserved

40-1.03L(2) Preliminary Finishing

40-1.03L(2)(a) General

Preliminary finishing must produce a smooth and true-to-grade finish. After preliminary finishing, mark each day's paving with a stamp. The stamp must be authorized before paving starts. The stamp must be approximately 1 by 2 feet in size. The stamp must form a uniform mark from 1/8 to 1/4 inch deep. Locate the mark 20 ± 5 feet from the transverse construction joint formed at each day's start of paving and 1 ± 0.25 foot from the pavement's outside edge. The stamp mark must show the month, day, and year of placement and the station of the transverse construction joint. Orient the stamp mark so it can be read from the pavement's outside edge.

Do not apply more water to the pavement surface than can evaporate before float finishing and texturing are completed.

40-1.03L(2)(b) Stationary Side Form Finishing

If stationary side form construction is used, give the pavement a preliminary finish by the machine float method or the hand method.

If using the machine float method:

1. Use self-propelled machine floats.
2. Determine the number of machine floats required to perform the work at a rate equal to the pavement delivery rate. If the time from paving to machine float finishing exceeds 30 minutes, stop pavement delivery. When machine floats are in proper position, you may resume pavement delivery and paving.
3. Run machine floats on side forms or adjacent pavement lanes. If running on adjacent pavement, protect the adjacent pavement surface under section 40-1.03P. Floats must be hardwood, steel, or steel-shod wood. Floats must be equipped with devices that adjust the underside to a true flat surface.

If using the hand method, finish pavement smooth and true to grade with manually operated floats or powered finishing machines.

40-1.03L(2)(c) Slip-Form Finishing

If slip-form construction is used, the slip-form paver must give the pavement a preliminary finish. You may supplement the slip-form paver with machine floats.

Before the pavement hardens, correct pavement edge slump in excess of 0.02 foot exclusive of edge rounding.

40-1.03L(3) Final Finishing

After completing preliminary finishing, round the edges of the initial paving widths to a 0.04-foot radius. Round transverse and longitudinal construction joints to a 0.02-foot radius.

Before curing, texture the pavement. Perform initial texturing with a burlap drag or broom device that produces striations parallel to the centerline. Perform final texturing with a steel-tined device that produces grooves parallel with the centerline.

Construct longitudinal grooves with a self-propelled machine designed specifically for grooving and texturing pavement. The machine must have tracks to maintain constant speed, provide traction, and maintain accurate tracking along the pavement surface. The machine must have a single row of rectangular spring steel tines. The tines must be from 3/32 to 1/8 inch wide, on 3/4-inch centers, and must have enough length, thickness, and resilience to form grooves approximately 3/16 inch deep. The machine must have horizontal and vertical controls. The machine must apply constant down pressure on the pavement surface during texturing. The machines must not cause ravels.

Construct grooves over the entire pavement width in a single pass except do not construct grooves 3 inches from the pavement edges and longitudinal joints. Final texture must be uniform and smooth. Use a guide to properly align the grooves. Grooves must be parallel and aligned to the pavement edge across the pavement width. Grooves must be from 1/8 to 3/16 inch deep after the pavement has hardened.

For irregular areas and areas inaccessible to the grooving machine, you may hand-construct grooves under section 40-1.03L(2) using the hand method. Hand-constructed grooves must comply with the specifications for machine-constructed grooves.

Initial and final texturing must produce a coefficient of friction of at least 0.30 when tested under California Test 342. Notify the Engineer when the pavement is scheduled to be opened to traffic to allow at least 25 days for the Department to schedule testing for coefficient of friction. Notify the Engineer when the pavement is ready for testing which is the latter of:

1. Seven days after paving
2. When the pavement has attained a modulus of rupture of 550 psi

The Department tests for coefficient of friction within 7 days of receiving notification that the pavement is ready for testing.

Do not open the pavement to traffic unless the coefficient of friction is at least 0.30.

40-1.03M Reserved

Replace the 4th paragraph of 40-1.03P with:

01-20-12

Construct crossings for traffic convenience. If authorized, you may use RSC for crossings. Do not open crossings until the Department determines that the pavement's modulus of rupture is at least 550 psi under California Test 523 or California Test 524.

Replace the 1st paragraph of section 40-6.01A with:

01-20-12

Section 40-6 includes specifications for applying a high molecular weight methacrylate resin system to pavement surface cracks that do not extend the full slab depth.

Replace the 4th paragraph of section 40-6.01C(2) with:

01-20-12

If the project is in an urban area adjacent to a school or residence, the public safety plan must also include an airborne emissions monitoring plan prepared by a CIH certified in comprehensive practice by the American Board of Industrial Hygiene. Submit a copy of the CIH's certification. The CIH must monitor the emissions at a minimum of 4 points including the mixing point, the application point, and the point of nearest public contact. At work completion, submit a report by the industrial hygienist with results of the airborne emissions monitoring plan.

Delete the 1st sentence of the 2nd paragraph in section 40-6.02B.

01-20-12

Replace item 4 in the list in the last paragraph in section 40-6.03A with:

01-20-12

4. Coefficient of friction is at least 0.30 under California Test 342

Replace the 2nd paragraph of section 49-2.01D with:

01-20-12

Furnish piling is measured along the longest side of the pile from the specified tip elevation shown to the plane of pile cutoff.

Replace "sets" in the 1st paragraph of section 49-2.04A(3) with:

04-19-13

copies

Replace the 3rd and 4th paragraphs of section 49-2.04B(2) with:

10-19-12

Piles in a corrosive environment must be steam or water cured under section 90-4.03.

If piles in a corrosive environment are steam cured, either:

1. Keep the piles continuously wet for at least 3 days. The 3 days includes the holding and steam curing periods.
2. Apply curing compound under section 90-1.03B(3) after steam curing.

Add to section 49-3.01A:

01-20-12

Concrete must comply with section 51.

Replace the 1st paragraph of section 49-3.01C with:

01-20-12

Except for CIDH concrete piles constructed under slurry, construct CIP concrete piles such that the excavation methods and the concrete placement procedures provide for placing the concrete against undisturbed material in a dry or dewatered hole.

Replace "Reserved" in section 49-3.02A(2) with:

01-20-12

dry hole:

1. Except for CIDH concrete piles specified as end bearing, a drilled hole that:
 - 1.1. Accumulates no more than 12 inches of water in the bottom of the drilled hole during a period of 1 hour without any pumping from the hole during the hour.
 - 1.2. Has no more than 3 inches of water in the bottom of the drilled hole immediately before placing concrete.
2. For CIDH concrete piles specified as end bearing, a drilled hole free of water without the use of pumps.

Replace "Reserved" in section 49-3.02A(3)(a) with:

01-20-12

If plastic spacers are proposed for use, submit the manufacturer's data and a sample of the plastic spacer. Allow 10 days for review.

Replace item 5 in the list in the 1st paragraph of section 49-3.02A(3)(b) with:

10-19-12

5. Methods and equipment for determining:
 - 5.1. Depth of concrete
 - 5.2. Theoretical volume of concrete to be placed, including the effects on volume if casings are withdrawn
 - 5.3. Actual volume of concrete placed

Add to the list in the 1st paragraph of section 49-3.02A(3)(b):

01-18-13

8. Drilling sequence and concrete placement plan.

Replace item 2 in the list in the 1st paragraph of section 49-3.02A(3)(g) with:

01-20-12

2. Be sealed and signed by an engineer who is registered as a civil engineer in the State. This requirement is waived for either of the following conditions:
 - 2.1. The proposed mitigation will be performed under the current Department-published version of *ADSC Standard Mitigation Plan 'A' - Basic Repair* without exception or modification.
 - 2.2. The Engineer determines that the rejected pile does not require mitigation due to structural, geotechnical, or corrosion concerns, and you elect to repair the pile using the current Department-published version of *ADSC Standard Mitigation Plan 'B' - Grouting Repair* without exception or modification.

Replace item 1 in the list in the 1st paragraph of section 49-3.02A(4)(d)(ii) with:

01-20-12

1. Inspection pipes must be schedule 40 PVC pipe complying with ASTM D 1785 with a nominal pipe size of 2 inches. Watertight PVC couplers complying with ASTM D 2466 are allowed to facilitate pipe lengths in excess of those commercially available. Log the location of the inspection pipe couplers with respect to the plane of pile cutoff.

Add to section 49-3.02A(4)(d)(iv):

01-20-12

If the Engineer determines it is not feasible to use one of ADSC's standard mitigation plans to mitigate the pile, schedule a meeting and meet with the Engineer before submitting a nonstandard mitigation plan.

The meeting attendees must include your representatives and the Engineer's representatives involved in the pile mitigation. The purpose of the meeting is to discuss the type of pile mitigation acceptable to the Department.

Provide the meeting facility. The Engineer conducts the meeting.

Replace the 1st paragraph of section 49-3.02B(5) with:

01-20-12

Grout used to backfill casings must comply with section 50-1.02C, except:

1. Grout must consist of cementitious material and water, and may contain an admixture if authorized. Cementitious material must comply with section 90-1.02B, except SCMs are not required. The minimum cementitious material content of the grout must not be less than 845 lb/cu yd of grout.
2. Aggregate must be used to extend the grout as follows:

2. Each jack used to tension prestressing steel permanently anchored at 25 percent or more of its specified minimum ultimate tensile strength must be calibrated by METS within 1 year of use and after each repair. You must:
 - 2.1. Schedule the calibration of the jacking equipment with METS
 - 2.2. Verify that the jack and supporting systems are complete, with proper components, and are in good operating condition
 - 2.3. Mechanically calibrate the gages with a dead weight tester or other authorized means before calibration of the jacking equipment by METS
 - 2.4. Provide enough labor, equipment, and material to (1) install and support the jacking and calibration equipment and (2) remove the equipment after the calibration is complete
 - 2.5. Plot the calibration results
3. Each jack used to tension prestressing steel permanently anchored at less than 25 percent of its specified minimum ultimate tensile strength must be calibrated by an authorized laboratory within 6 months of use and after each repair.

Replace "diameter" in item 9 in the list in the 1st paragraph of section 50-1.02D with:

cross-sectional area

04-20-12

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.

You must provide enclosures for cleaning and painting structural steel. Cleaning and painting of new structural steel must be performed in an Enclosed Shop as defined in AISC-420-10/SSPC-QP 3. Maintain atmospheric conditions inside enclosures within specified limits.

Except for blast cleaning within closed buildings, perform blast cleaning and painting during daylight hours.

Replace item 1 in the list in the 2nd paragraph of section 59-2.03C(1) with:

10-19-12

1. Apply a stripe coat of undercoat paint on all edges, corners, seams, crevices, interior angles, junctions of joining members, weld lines, and similar surface irregularities. The stripe coat must completely hide the surface being covered. If spot blast cleaning portions of the bridge, apply the stripe coat of undercoat paint before each undercoat and follow with the undercoat as soon as practical. If removing all existing paint from the bridge, apply the undercoat first as soon as practical and follow with the stripe coat of undercoat paint for each undercoat.

Replace the heading of section 59-2.03C(2) with:

04-19-13

Zinc Coating System

Add to section 59-2.03C(2)(a):

04-19-13

Coatings for new structural steel and connections between new and existing structural steel must comply with the requirements shown in the following table:

Zinc Coating System		
Description	Coating	Dry film thickness (mils)
All new surfaces:		
Undercoat	Inorganic zinc primer, AASHTO M 300 Type I or II	4–8
Finish coat ^a	Exterior grade latex ^b , 2 coats	2 minimum each coat, 4–8 total
Total thickness, all coats		8–14
Connections to existing structural steel:^c		
Undercoat	Inorganic zinc primer, AASHTO M 300 Type I or II	4–8
Finish coat ^a	Exterior grade latex ^b , 2 coats	2 minimum each coat, 4–8 total
Total thickness, all coats		8–14

^aIf no finish coats are described, a final coat of inorganic zinc primer is required.

^bExterior grade latex must comply with section 91-2.02 unless otherwise specified.

^cIncludes the following locations:

1. New and existing contact surfaces
2. Existing member surfaces under new HS bolt heads, nuts, or washers
3. Bare surfaces of existing steel after trimming, cutting, drilling, or reaming
4. Areas within a 4-inch radius from the point of application of heat for welding or flame cutting

Add to section 59-2.03C:

04-19-13

59-2.03C(3) Moisture-Cured Polyurethane Coating System

Reserved

59-2.03C(4) State Specification Paint Waterborne Coating System

59-2.03C(4)(a) General

The State Specification PWB coating system for existing structural steel must comply with the requirements shown in the following table:

State Specification PWB Coating System

Surface	Description	State Specification PWB Coating	Dry film thickness (mils)
Surfaces cleaned to bare metal ^a :	1st undercoat	145	2-3
	2nd undercoat	146	2-3
	1st finish coat	171	1.5-3
	2nd finish coat	172	1.5-3
	Total thickness, all coats	--	7-12
Existing painted surfaces to be topcoated:	Undercoat	146	2-3
	1st finish coat	171	1.5-3
	2nd finish coat	172	1.5-3
	Total thickness, new coats	--	5-9

^aIncludes locations of spot blast cleaning

59-2.03C(4)(b) Finish Coats

Pressure rinse undercoated surfaces to receive finish coats. Perform pressure rinsing no sooner than 72 hours after the final application of undercoat.

The 1st finish coat must be applied within 48 hours of pressure rinsing.

Apply the 1st finish coat in 2 applications. The 1st application consists of a spray-applied mist application. Apply the 2nd application after the mist application has dried to a set-to-touch condition as determined using the procedure in section 7 of ASTM D 1640.

Apply the 2nd finish coat after the 1st finish coat has dried 12 hours unless authorized. You may apply the 2nd finish coat in a single application.

Add to section 59-5.01:

04-19-13

Where specified, prepare and paint sign structures under sections 59-2 and 59-3.

Instead of submitting proof of the certification complying with SSPC-QP 1, you may submit documentation with the painting quality work plan showing compliance with the requirements in section 3 of SSPC-QP 1.

Instead of submitting proof of the certification complying with SSPC-QP 2, you may submit documentation with the painting quality work plan showing compliance with the requirements in sections 4.2 through 4.4 of SSPC-QP 2, Category A.

Instead of submitting proof of the certification complying with AISC-420-10/SSPC-QP 3 (Enclosed Shop), you may submit documentation with the painting quality work plan showing compliance with the requirements in sections 5 through 18 of AISC-420-10/SSPC-QP3.

86 ELECTRICAL SYSTEMS

10-19-12

Replace section 86-2.06 with:

01-20-12

86-2.06 PULL BOXES

86-2.06A General

86-2.06A(1) Cover Marking

Marking must be clearly defined, uniform in depth, and parallel to either the long or short sides of the cover.

Marking letters must be 1 to 3 inches high.

Before galvanizing steel or cast iron cover, apply marking by one of the following methods:

1. Use cast iron strip at least 1/4 inch thick with letters raised a minimum of 1/16 inch. Fasten strip to cover with 1/4-inch flathead stainless steel machine bolts and nuts. Peen bolts after tightening.
2. Use sheet steel strip at least 0.027 inch thick with letters raised a minimum of 1/16 inch. Fasten strip to cover by spot welding, tack welding, or brazing, with 1/4-inch stainless steel rivets or 1/4-inch roundhead stainless steel machine bolts and nuts. Peen bolts after tightening.
3. Bead weld the letters on cover such that the letters are raised a minimum of 3/32 inch.

86-2.06A(2) Installation and Use

Space pull boxes no more than 200 feet apart. You may install additional pull boxes to facilitate the work.

You may use a larger standard size pull box than that shown on the plans or specified.

A pull box in ground or sidewalk area must be installed as follows:

1. Embed bottom of the pull box in crushed rock.
2. Place a layer of roofing paper on the crushed rock.
3. Place grout over the layer of roofing paper. Grout must be 0.50 to 1 inch thick and sloped toward the drain hole.
4. Make a 1-inch drain hole in the center of the pull box through the grout and roofing paper.
5. Place grout between the pull box and the pull box extension, and around conduits.

The top of the pull box must be flush with the surrounding grade or the top of an adjacent curb, except in unpaved areas where the pull box is not immediately adjacent to and protected by a concrete foundation, pole, or other protective construction. Place the pull box 1-1/4 inches above the surrounding grade. Where practical, place a pull box shown in the vicinity of curbs or adjacent to a standard on the side of the foundation facing away from traffic. If a pull box is installed in a sidewalk area, adjust the depth of the pull box so that the top of the pull box is flush with the sidewalk.

Reconstruct the sump of an existing pull box if disturbed by your activities. Remove old grout and replace with new if the sump was grouted.

86-2.06B Non-Traffic-Rated Pull Boxes

Reserved

86-2.06C Traffic Pull Boxes

Traffic pull box and cover must comply with ASTM C857, "Standard Practice for Minimum Structural Design Loading for Underground Precast Concrete Utility Structures," for HS20-44 loading. You must be able to place the load anywhere on the box and cover for 1 minute without causing cracks or permanent deformations.

Frame must be anchored to the box with 1/4 by 2-1/4 inch concrete anchors. Four concrete anchors must be included for No. 3-1/2(T) pull box; one placed in each corner. Six concrete anchors must be included for No. 5(T) and No. 6(T) pull boxes; one placed in each corner and one near the middle of each of the longer sides.

Nuts must be zinc-plated carbon steel, vibration resistant, and have a wedge ramp at the root of the thread.

After installation of traffic pull box, install the steel cover and keep it bolted down when your activities are not in progress at the pull box. When the steel cover is placed for the final time, the cover and Z bar frame must be cleaned of debris and tightened securely.

Steel cover must be countersunk approximately 1/4 inch to accommodate the bolt head. When tightened, the bolt head must not exceed more than 1/8 inch above the top of the cover.

Concrete placed around and under traffic pull boxes must be minor concrete.

Replace "project" in the 3rd paragraph of section 86-2.11A with:

work

10-19-12

Replace "Contract" in item 2 in the list in the 11th paragraph of section 86-2.11A with:

work

10-19-12

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:

Geocomposite wall drain must be from 0.25 to 2 inches thick.

10-19-12

Replace the value for permittivity of woven fabric in the table in the 1st paragraph of section 88-1.02E with:

0.05

01-20-12

Replace the value for apparent size opening of nonwoven fabric in the table in the 1st paragraph of section 88-1.02E with:

0.012

01-20-12

Replace the table in the 1st paragraph of section 88-1.02G with:

01-20-12

Sediment Filter Bag

Property	Test	Values	
		Woven	Nonwoven
Grab breaking load, lb, 1-inch grip min, in each direction	ASTM D 4632	200	250
Apparent elongation, percent min, in each direction	ASTM D 4632	10	50
Water flow rate, gal per minute/sq ft min and max average roll value	ASTM D 4491	100-200	75-200
Permittivity, sec ⁻¹ min	ASTM D 4491	1.0	1.0
Apparent opening size, inches max average roll value	ASTM D 4751	0.023	0.012
Ultraviolet resistance, % min retained grab breaking load, 500 hr.	ASTM D 4355	70	70

Replace the table in the 1st paragraph of section 88-1.02H with:

01-20-12

Temporary Cover

Property	Test	Values	
		Woven	Nonwoven
Grab breaking load, lb, 1-inch grip min, in each direction	ASTM D 4632	200	200
Apparent elongation, percent min, in each direction	ASTM D 4632	15	50
Water flow rate, gal per minute/sq ft min and max average roll value	ASTM D 4491	4-10	80-120
Permittivity, sec ⁻¹ min	ASTM D 4491	0.05	1.0
Apparent opening size, inches max average roll value	ASTM D 4751	0.023	0.012
Ultraviolet resistance, % min retained grab breaking load, 500 hr.	ASTM D 4355	70	70

Replace section 88-1.02P with:

01-18-13

88-1.02P Biaxial Geogrid

Geosynthetics used for biaxial geogrid must be a punched and drawn polypropylene material formed into an integrally formed biaxial grid. When tested under the referenced test methods, properties of biaxial geogrid must have the values shown in the following table:

