



STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

**NOTICE TO BIDDERS
AND
SPECIAL PROVISIONS**

**FOR CONSTRUCTION ON STATE HIGHWAY IN MARIN COUNTY IN AND NEAR
NOVATO FROM 0.2 MILE NORTH OF ATHERTON AVENUE OVERCROSSING
TO 1.4 MILES SOUTH OF REDWOOD LANDFILL OVERCROSSING.**

In District 04 On Route 101

Under

Bid book dated July 30, 2012

Standard Specifications dated 2010

Project plans approved June 18, 2012

Standard Plans dated 2010

Identified by

Contract No. 04-2640L4

04-Mrn-101-R22.2/24.3

Project ID 0412000337

Electronic Advertising Contract

Bids open Wednesday, October 3, 2012
Dated July 30, 2012

OSD
IH

SPECIAL NOTICES

- See section 2-1.03 for mandatory prebid meeting requirements.

CONTRACT NO. 04-2640L4

DESIGN OVERSIGHT APPROVAL	REGISTRATION NO.	DATE
PRINTED NAME <i>James Chang</i>	SIGNATURE <i>[Signature]</i>	74690
		12/31/13

Complete for projects prepared by consultants or local agencies only.

Approved as to impact State facilities and conformance with applicable State standards and practices as described in the A & E Consultant Services Manual.

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

STRUCTURES

[Signature]

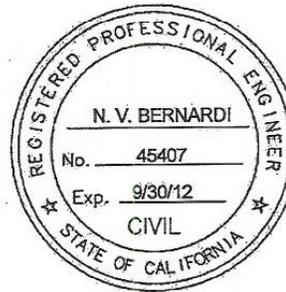
REGISTERED CIVIL ENGINEER



HIGHWAY

[Signature]

REGISTERED CIVIL ENGINEER



ELECTRICAL (HIGHWAY)

David W. Clow

REGISTERED CIVIL ENGINEER OR
REGISTERED ELECTRICAL ENGINEER

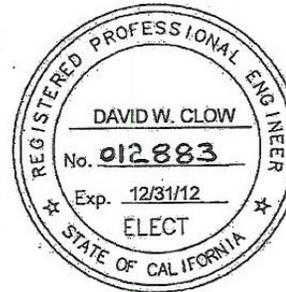


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STANDARD PLANS LIST

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

A10A	Abbreviations (Sheet 1 of 2)
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A10C	Lines and Symbols (Sheet 1 of 3)
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A10E	Lines and Symbols (Sheet 3 of 3)
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A20B	Pavement Markers and Traffic Lines, Typical Details
A20C	Pavement Markers and Traffic Lines, Typical Details
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A24C	Pavement Markings - Symbols and Numerals
A24D	Pavement Markings - Words
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A62A	Excavation and Backfill - Miscellaneous Details
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A73B	Markers
A73C	Delineators, Channelizers and Barricades
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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
A77C1	Metal Beam Guard Railing - Wood Post and Wood Block Details
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A77C3	Metal Beam Guard Railing - Typical Line Post Embedment and Hinge Point Offset Details
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A77C6	Metal Beam Guard Railing - Typical Vegetation Control for Terminal System End Treatments
A77C7	Metal Beam Guard Railing - Typical Vegetation Control at Structure Approach and Departure
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A77F1	Metal Beam Guard Railing - Typical Layouts for Structure Approach
A77F4	Metal Beam Guard Railing - Typical Layouts for Structure Departure
A77F5	Metal Beam Guard Railing - Typical Layouts for Structure Departure
A77G3	Metal Beam Guard Railing - Typical Layouts for Roadside Fixed Objects
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A77H3	Metal Railing - Anchor Cable and Anchor Plate Details
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)
A78A	Thrie Beam Barrier - Standard Barrier Railing Section (Wood Post with Wood Block)
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
A78C4	Double Thrie Beam Barrier - Typical Vegetation Control Standard Barrier Railing Section
A78C6	Thrie Beam Barrier - Typical Vegetation Control at Structure Approach
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A85B	Chain Link Fence Details
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A87B	Hot Mix Asphalt Dikes
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D71	Drainage Inlet Markers
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D73A	Drainage Inlets (Precast)
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D77B	Bicycle Proof Grate Details
D78C	Inlet Depressions - Hot Mix Asphalt Shoulders
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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)
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T13	Traffic Control System for Lane Closure on Two Lane Conventional Highways
T56	Temporary Water Pollution Control Details (Temporary Fiber Roll)
T58	Temporary Water Pollution Control Details (Temporary Construction Entrance)
T59	Temporary Water Pollution Control Details (Temporary Concrete Washout Facility)
T63	Temporary Water Pollution Control Details (Temporary Drainage Inlet Protection)
T64	Temporary Water Pollution Control Details (Temporary Drainage Inlet Protection)
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B0-1	Bridge Details
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B6-21	Joint Seals (Maximum Movement Rating = 2")
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B8-5	Cast-In-Place Prestressed Girder Details
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B14-3	Communication and Sprinkler Control Conduits (Conduit Less Than 4")
RS1	Roadside Signs, Typical Installation Details No. 1
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ES-1B	Electrical Systems (Legend, Notes and Abbreviations)
ES-1C	Electrical Systems (Legend, Notes and Abbreviations)
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ES-2D	Electrical Systems (Service Equipment Enclosure and Typical Wiring Diagram, Type III - A Series)
ES-3C	Electrical Systems (Controller Cabinet Foundation Details)
ES-5A	Electrical Systems (Detectors)
ES-5B	Electrical Systems (Detectors)
ES-5D	Electrical Systems (Curb Termination and Handhole)
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RSP ES-8A	Electrical Systems (Pull Box)
RSP ES-8B	Electrical Systems (Traffic Rated Pull Box)
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ES-9B	Electrical Systems (Conduit Riser and Expansion Fitting, Structure Installations)
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NOTICE TO BIDDERS

Bids open Wednesday, October 3, 2012

Dated July 30, 2012

General work description: Place HMA on base, construct bridge, install rail.

The Department will receive sealed bids for CONSTRUCTION ON STATE HIGHWAY IN MARIN COUNTY IN AND NEAR NOVATO FROM 0.2 MILE NORTH OF ATHERTON AVENUE OVERCROSSING TO 1.4 MILES SOUTH OF REDWOOD LANDFILL OVERCROSSING.

District-County-Route-Post Mile: 04-Mrn-101-R22.2/24.3

Contract No. 04-2640L4

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

The Department establishes no DVBE Contract goal but encourages bidders to obtain DVBE participation.

Bids must be on a cost+time basis.

Complete the work within the number of working days bid.

Do not bid more than 250 working days.

The estimated cost of the project is \$12,100,000.

A mandatory prebid meeting is scheduled for this project at 1-3pm, on September 5, 2012, at Elihu Harris State Building, 1515 Clay St. Oakland, Ca, Room 1.

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.

Under Govt Code § 14835 et seq. and 2 CA Code of Regs § 1896 et seq., the Department gives preference to certified small businesses and non-small businesses who commit to 25 percent certified small business participation.

Under Pub Cont Code § 6107, the Department gives preference to a "California company," as defined, for bid comparison purposes over a nonresident contractor from any state that gives or requires a preference to be given to contractors from that state on its public entity construction contracts.

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 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

KEB

COPY OF BID ITEM LIST

Item No.	Item Code	Item Description	Unit of Measure	Estimated Quantity
1	070012	PROGRESS SCHEDULE (CRITICAL PATH METHOD)	LS	LUMP SUM
2	071321	TEMPORARY FENCE (TYPE CL-6)	LF	560
3	071325	TEMPORARY FENCE (TYPE ESA)	LF	1,330
4	073005	15" TEMPORARY CULVERT	LF	50
5	074015	TEMPORARY ACTIVE TREATMENT SYSTEM	LS	LUMP SUM
6	074019	PREPARE STORM WATER POLLUTION PREVENTION PLAN	LS	LUMP SUM
7	074028	TEMPORARY FIBER ROLL	LF	26,100
8	074033	TEMPORARY CONSTRUCTION ENTRANCE	EA	13
9	074038	TEMPORARY DRAINAGE INLET PROTECTION	EA	54
10	074040	TEMPORARY HYDRAULIC MULCH (BONDED FIBER MATRIX)	SQYD	3,860
11	074041	STREET SWEEPING	LS	LUMP SUM
12	074042	TEMPORARY CONCRETE WASHOUT (PORTABLE)	LS	LUMP SUM
13	074056	RAIN EVENT ACTION PLAN	EA	53
14	074057	STORM WATER ANNUAL REPORT	EA	2
15	074058	STORM WATER SAMPLING AND ANALYSIS DAY	EA	32
16	090105	TIME-RELATED OVERHEAD (LS)	LS	LUMP SUM
17	120090	CONSTRUCTION AREA SIGNS	LS	LUMP SUM
18	120100	TRAFFIC CONTROL SYSTEM	LS	LUMP SUM
19	120120	TYPE III BARRICADE	EA	10
20	120149	TEMPORARY PAVEMENT MARKING (PAINT)	SQFT	210

Item No.	Item Code	Item Description	Unit of Measure	Estimated Quantity
21	120159	TEMPORARY TRAFFIC STRIPE (PAINT)	LF	31,800
22	120165	CHANNELIZER (SURFACE MOUNTED)	EA	180
23	120300	TEMPORARY PAVEMENT MARKER	EA	2,370
24	128651	PORTABLE CHANGEABLE MESSAGE SIGN (EA)	EA	4
25	129000	TEMPORARY RAILING (TYPE K)	LF	33,700
26	129100	TEMPORARY CRASH CUSHION MODULE	EA	70
27	129110	TEMPORARY CRASH CUSHION	EA	7
28	130100	JOB SITE MANAGEMENT	LS	LUMP SUM
29	141120	TREATED WOOD WASTE	LB	157,000
30	150662	REMOVE METAL BEAM GUARD RAILING	LF	310
31	150714	REMOVE THERMOPLASTIC TRAFFIC STRIPE	LF	20,400
32	150715	REMOVE THERMOPLASTIC PAVEMENT MARKING	SQFT	260
33	150722	REMOVE PAVEMENT MARKER	EA	2,120
34	150742	REMOVE ROADSIDE SIGN	EA	10
35	150770	REMOVE ASPHALT CONCRETE PAVEMENT (SQFT)	SQFT	840
36	150771	REMOVE ASPHALT CONCRETE DIKE	LF	1,440
37	150809	REMOVE CULVERT (LF)	LF	680
38	150820	REMOVE INLET	EA	13
39	150821	REMOVE HEADWALL	EA	3
40	150850	REMOVE SLOPE PAVING (SQFT)	SQFT	25,300

Item No.	Item Code	Item Description	Unit of Measure	Estimated Quantity
41	150860	REMOVE BASE AND SURFACING	CY	90
42	151265	SALVAGE SINGLE THRIE BEAM BARRIER	LF	780
43	151266	SALVAGE DOUBLE THRIE BEAM BARRIER	LF	7,900
44	152390	RELOCATE ROADSIDE SIGN	EA	5
45	152430	ADJUST INLET	EA	1
46	152609	MODIFY INLET TO MANHOLE	EA	1
47	153103	COLD PLANE ASPHALT CONCRETE PAVEMENT	SQYD	9,820
48	153121	REMOVE CONCRETE (CY)	CY	48
49	153139	REMOVE CONCRETE SIDEWALK (LF)	LF	170
50	153215	REMOVE CONCRETE (CURB AND GUTTER)	LF	350
51	024488	CLEANING CULVERT	EA	2
52	156572	REMOVE RAILING	LF	100
53	157560	BRIDGE REMOVAL (PORTION)	LS	LUMP SUM
54	160102	CLEARING AND GRUBBING (LS)	LS	LUMP SUM
55	170101	DEVELOP WATER SUPPLY	LS	LUMP SUM
56	190101	ROADWAY EXCAVATION	CY	23,900
57	190107	ROADWAY EXCAVATION (TYPE Y-1) (AERIALY DEPOSITED LEAD)	CY	3,000
58	190110	LEAD COMPLIANCE PLAN	LS	LUMP SUM
59	190111	ADL BURIAL LOCATION REPORT	LS	LUMP SUM
60	190113	ASBESTOS COMPLIANCE PLAN	LS	LUMP SUM

Item No.	Item Code	Item Description	Unit of Measure	Estimated Quantity
61	190185	SHOULDER BACKING	TON	30
62 (F)	192003	STRUCTURE EXCAVATION (BRIDGE)	CY	280
63 (F)	192020	STRUCTURE EXCAVATION (TYPE D)	CY	1,497
64 (F)	193003	STRUCTURE BACKFILL (BRIDGE)	CY	984
65 (F)	193118	CONCRETE BACKFILL	CY	3
66	194001	DITCH EXCAVATION	CY	3,870
67	198208	SUBGRADE ENHANCEMENT GEOTEXTILE, CLASS B1	SQYD	220
68	024489	IMPORTED BIOFILTRATION SOIL	CY	1,130
69	203021	FIBER ROLLS	LF	12,700
70	203026	MOVE-IN/MOVE-OUT (EROSION CONTROL)	EA	5
71	203034	ROLLED EROSION CONTROL PRODUCT (NETTING)	SQFT	45,800
72	210300	HYDROMULCH	SQFT	330,000
73	210430	HYDROSEED	SQFT	330,000
74	210600	COMPOST	SQFT	285,000
75	210630	INCORPORATE MATERIALS	SQFT	29,500
76	220101	FINISHING ROADWAY	LS	LUMP SUM
77	250401	CLASS 4 AGGREGATE SUBBASE	CY	11,900
78	260203	CLASS 2 AGGREGATE BASE (CY)	CY	1,820
79	280000	LEAN CONCRETE BASE	CY	6,410
80	374207	CRACK TREATMENT	LNMI	3.6

Item No.	Item Code	Item Description	Unit of Measure	Estimated Quantity
81	390010	PREPAVING PROFILOGRAPH	LS	LUMP SUM
82	390020	PREPAVING GRINDING DAY	EA	1
83	390095	REPLACE ASPHALT CONCRETE SURFACING	CY	700
84	390131	HOT MIX ASPHALT	TON	13,000
85	390134	HOT MIX ASPHALT (OPEN GRADED)	TON	3,740
86	390137	RUBBERIZED HOT MIX ASPHALT (GAP GRADED)	TON	3,840
87	394060	DATA CORE	LS	LUMP SUM
88	394074	PLACE HOT MIX ASPHALT DIKE (TYPE C)	LF	260
89	394076	PLACE HOT MIX ASPHALT DIKE (TYPE E)	LF	2,480
90	394077	PLACE HOT MIX ASPHALT DIKE (TYPE F)	LF	250
91	397005	TACK COAT	TON	21
92	490782	FURNISH PILING (CLASS 200) (ALTERNATIVE W)	LF	5,275
93	490783	DRIVE PILE (CLASS 200) (ALTERNATIVE W)	EA	79
94	495187	FURNISH CAST-IN-STEEL SHELL CONCRETE PILING (NSP 72)	LF	341
95	495188	DRIVE CAST-IN-STEEL SHELL CONCRETE PILE (NPS 72)	EA	4
96	500001	PRESTRESSING CAST-IN-PLACE CONCRETE	LS	LUMP SUM
97 (F)	510051	STRUCTURAL CONCRETE, BRIDGE FOOTING	CY	372
98 (F)	510053	STRUCTURAL CONCRETE, BRIDGE	CY	1,384
99 (F)	510086	STRUCTURAL CONCRETE, APPROACH SLAB (TYPE N)	CY	74
100 (F)	510087	STRUCTURAL CONCRETE, APPROACH SLAB (TYPE R)	CY	152

Item No.	Item Code	Item Description	Unit of Measure	Estimated Quantity
101 (F)	510090	STRUCTURAL CONCRETE, BOX CULVERT	CY	21
102	024490	PRECAST REINFORCED CONCRETE BOX CULVERT	LF	178
103 (F)	510502	MINOR CONCRETE (MINOR STRUCTURE)	CY	81
104 (F)	510800	PAVING NOTCH EXTENSION	CF	171
105	511106	DRILL AND BOND DOWEL	LF	191
106	511110	DRILL AND BOND DOWEL (CHEMICAL ADHESIVE)	EA	36
107	519100	JOINT SEAL (MR 2")	LF	347
108	519102	JOINT SEAL (TYPE AL)	LF	95
109 (F)	520101	BAR REINFORCING STEEL	LB	1,770
110 (F)	520102	BAR REINFORCING STEEL (BRIDGE)	LB	466,457
111	560248	FURNISH SINGLE SHEET ALUMINUM SIGN (0.063"-UNFRAMED)	SQFT	150
112	560249	FURNISH SINGLE SHEET ALUMINUM SIGN (0.080"-UNFRAMED)	SQFT	40
113	566011	ROADSIDE SIGN - ONE POST	EA	13
114	620080	15" ALTERNATIVE PIPE CULVERT	LF	20
115	620100	18" ALTERNATIVE PIPE CULVERT	LF	2,100
116	620715	18" ALTERNATIVE SLOTTED PIPE	LF	61
117	620800	CONCRETE BACKFILL (PIPE TRENCH)	CY	120
118	650012	15" REINFORCED CONCRETE PIPE	LF	20
119	650014	18" REINFORCED CONCRETE PIPE	LF	670
120	650018	24" REINFORCED CONCRETE PIPE	LF	34

Item No.	Item Code	Item Description	Unit of Measure	Estimated Quantity
121	650022	30" REINFORCED CONCRETE PIPE	LF	380
122	650026	36" REINFORCED CONCRETE PIPE	LF	9
123	680405	8" PERFORATED STEEL PIPE UNDERDRAIN (.064" THICK)	LF	96
124	680902	6" PERFORATED PLASTIC PIPE UNDERDRAIN	LF	5,120
125	690105	8" CORRUGATED STEEL PIPE DOWNDRAIN (.064" THICK)	LF	112
126	703210	12" CORRUGATED STEEL PIPE RISER (.064" THICK)	LF	13
127	705204	18" CONCRETE FLARED END SECTION	EA	5
128	720110	SMALL-ROCK SLOPE PROTECTION	CY	8
129	721028	ROCK SLOPE PROTECTION (NO. 2, METHOD B) (CY)	CY	36
130	721420	CONCRETE (DITCH LINING)	CY	16
131 (F)	721810	SLOPE PAVING (CONCRETE)	CY	260
132	729011	ROCK SLOPE PROTECTION FABRIC (CLASS 8)	SQYD	130
133	731502	MINOR CONCRETE (MISCELLANEOUS CONSTRUCTION)	CY	45
134	731504	MINOR CONCRETE (CURB AND GUTTER)	CY	21
135	731521	MINOR CONCRETE (SIDEWALK)	CY	8
136 (F)	750001	MISCELLANEOUS IRON AND STEEL	LB	14,405
137	802501	4' CHAIN LINK GATE (TYPE CL-6)	EA	1
138	820107	DELINEATOR (CLASS 1)	EA	10
139	820118	GUARD RAILING DELINEATOR	EA	11
140	820130	OBJECT MARKER	EA	3

Item No.	Item Code	Item Description	Unit of Measure	Estimated Quantity
141	832001	METAL BEAM GUARD RAILING	LF	320
142	832070	VEGETATION CONTROL (MINOR CONCRETE)	SQYD	460
143 (F)	044027	CHAIN LINK RAILING (TYPE 7 MODIFIED) (VINYL-CLAD)	LF	240
144	839310	DOUBLE THRIE BEAM BARRIER	LF	280
145	839541	TRANSITION RAILING (TYPE WB)	EA	6
146	839542	TRANSITION RAILING (TYPE DTB)	EA	2
147	839555	END CAP	EA	7
148	839581	END ANCHOR ASSEMBLY (TYPE SFT)	EA	2
149	839584	ALTERNATIVE IN-LINE TERMINAL SYSTEM	EA	4
150	839585	ALTERNATIVE FLARED TERMINAL SYSTEM	EA	2
151	839703	CONCRETE BARRIER (TYPE 60C)	LF	8,120
152 (F)	839718	CONCRETE BARRIER (TYPE 732R)	LF	492
153 (F)	839720	CONCRETE BARRIER (TYPE 732)	LF	590
154	840504	4" THERMOPLASTIC TRAFFIC STRIPE	LF	19,800
155	840515	THERMOPLASTIC PAVEMENT MARKING	SQFT	330
156	840526	4" THERMOPLASTIC TRAFFIC STRIPE (BROKEN 17-7)	LF	22,500
157	850101	PAVEMENT MARKER (NON-REFLECTIVE)	EA	1,860
158	850111	PAVEMENT MARKER (RETROREFLECTIVE)	EA	700
159	860090	MAINTAINING EXISTING TRAFFIC MANAGEMENT SYSTEM ELEMENTS DURING CONSTRUCTION	LS	LUMP SUM
160 (F)	860773	COMMUNICATION CONDUIT (BRIDGE) (LS)	LS	LUMP SUM

Item No.	Item Code	Item Description	Unit of Measure	Estimated Quantity
161	024491	VEHICLE SENSOR NODE REPLACEMENT	LS	LUMP SUM
162	860930	TRAFFIC MONITORING STATION	LS	LUMP SUM
163	024492	GENERAL PACKET RADIO SYSTEM WIRELESS MODEM ASSEMBLY	EA	1
164	999990	MOBILIZATION	LS	LUMP SUM

5 CONTROL OF WORK

Add to section 5-1.20A:

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

Coincident or Adjacent Contracts

Contract no.	County–Route–Post Mile	City	Type of work
04-264074	Mrn-101-R23.2/27.1	In Marin County in and Near Novato on Route 101	Interchange and Frontage Road
04-264064	MRN-101-18.66/R22.3	In Marin County in and Near Novato on Route 101	HOV Widening
04-1E3004	SF-101-3.4/8.3 SF-280- R6.6/R0.6 MRN-101-	In San Francisco and Marin Counties on Route 101	Treat Bridge Decks
04-0C8524	MRN-101- 12.8/18.8	In San Rafael on 101	Rehabilitate Roadway
N/A	MRN-101-R20.5	Novato Creek	Dredging by Marin County Flood Control and Water Conservation District
04-1E97074	MRN, SOL, SON – 1,12,37,101,505,680-VAR	In Marin, Solano, and Sonoma Counties at Various Locations on 101	Treat Bridge Decks
04-264084	SON-101-0.4/2.6	In Sonoma County, on Route 101	Construct Interchange
04-264094	MRN-101- 26.5/27.6	In Marin and Sonoma Counties, on Route 101	Realign Route 101
04-2640G4	MRN-101-R20.5/R20.9	Marin County, in Novato on 101	HOV Median Widening

Replace reserved in Section 5-1.20C with:

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 title, "Railroad Relations and Insurance Requirements." Comply with the provisions.

Add to section 5-1.36D:

The utilities shown in the following table will not be rearranged. The utilities may interfere with pile driving, drilling activities, or substructure construction. If you want any of them rearranged or temporarily deactivated, make arrangements with the utility owner.

12-2.03 CONSTRUCTION

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

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

12-2.04 PAYMENT

Not Used

Add to section 12-3.12C:

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

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

1. Stationary lane closure
2. Shoulder closure
3. Speed reduction zone

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 highway where the useable shoulder width is less than 5 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.

12-3.13 Payment

Not Used

Add section 12-3.18:

12-3.18 TEMPORARY CRASH CUSHION

12-3.18A General

12-3.18A(1) Summary

Section 12-3.18 includes specifications for furnishing, installing, maintaining, and removing temporary crash cushions.

12-3.18A(2) Submittals

Submit one copy of the manufacturer's plan and parts list for each model installed.

Submit a certificate of compliance from the manufacturer for each temporary crash cushion used on the project.

12-3.18B Materials

Temporary crash cushion must be either an ADIEM - 350 as manufactured by Trinity Industries, Inc., an (ABSORB 350 TL-3), as manufactured by Barrier Systems, Inc or the QuadGuard II CZ System (Model QZ2405Y) or ACZ350, both as manufactured by Energy Absorption Systems, Inc.

12-3.18B(1) ADIEM - 350

You can obtain the temporary crash cushion ADIEM - 350 from the manufacturer, Trinity Industries, Inc., P.O. Box 99, 950 West 400S, Centerville, Utah 84014, telephone 1-800-772-7976.

12-3.18B(2) ABSORB - 350

Temporary crash cushion (ABSORB 350 TL-3) must be a non-redirective, gating type, as manufactured by Barrier Systems, Inc. Temporary crash cushion (ABSORB 350 TL-3) must conform to the description as follows:

Contract Item Description	Manufacturer's Protect Description
ABSORB-350	ABSORB 350 TL-3 (9 element) CRASH CUSHION

You can obtain the temporary crash cushion (ABSORB 350 TL-3) from the following sources:

1. Manufacturer:
BARRIER SYSTEMS, Inc.,
180 River Road,
Rio Vista, CA 94571,
Telephone 1-888-800-3691
2. Distributors: Northern California:
Statewide Safety & Signs, Inc.
130 Grobric Court
Fairfield, CA 94533
Telephone 1-707-864-9956

12-3.18B(3) QuadGuard CZ II System and ACZ350 System

You can obtain Quadguard CZ II System and ACZ350 System from the following sources:

1. Manufacturer: Energy Absorption Systems, Inc. One East Wacker Drive, Suite 3000 Chicago, IL 60601-2076 Telephone (760) 438-7887.
2. Distributors:
 - 2.1 Traffic Control Service, Inc., 1881 Betmor Lane, Anaheim, CA 92805 Telephone (800) 222-8274.
 - 2.2 Traffic Control Service, Inc., 8585 Thys Court, Sacramento, CA 95828 Telephone (800) 884-8274

12-3.18C Construction

12-3.18C(1) Installation

Install the temporary crash cushion under the manufacturer's recommendations.

Attach a Type P marker panel to the front of the temporary crash cushion when the closest point of the crash cushion array is within 12 feet of the traveled way. The marker panel, when required, must be firmly fastened to the temporary crash cushion with commercial quality hardware or by other methods.

Dispose of surplus excavated material remaining after the temporary crash cushion has been installed in a uniform manner along the adjacent roadway as designated by the Engineer.

Install concrete anchorage devices used for attaching the QuadGuard CZ II System to the asphalt concrete pad under the manufacturer's recommendations and limit the anchorage devices to those which have been satisfactory for such application by previous testing.

12-3.18C(2) Maintenance

Keep on hand 2 replacement modules for each ADIEM in case of minor damage.

Fill holes left in the pavement after removal of the anchor rods with slurry cement backfill under section 19-3.02D.

At the completion of the project, temporary crash cushion and marker panels become your property. Remove them from the job site.

Immediately repair temporary crash cushions damaged due to your operations at your expense. Remove and replace at your expense temporary crash cushions damaged beyond repair due to your operations.

12-3.18D Payment

Department measures temporary crash cushion by the unit from actual count of cushions used in the work or as ordered by the Engineer.

Repairing the temporary crash cushion damaged by public traffic will be by change order work. Remove and immediately replace temporary crash cushions damaged beyond repair by public traffic when ordered by the Engineer.

If the Engineer orders a lateral move of the temporary crash cushion and the repositioning is not shown on the plans, moving the temporary crash cushion is by change order work and the temporary crash cushion is not counted for payment in the new position.

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.

For grinding and grooving operations, sawcutting concrete slabs, and installing loop detectors with an impact attenuator vehicle as a shadow vehicle, closure of the adjacent traffic lane is not required.

Designated holidays are as shown in the following table:

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

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

Special days are: The 3rd Monday in January.

Under a 1-way reversing traffic control operation, traffic may be stopped in 1 direction for periods not to exceed 2 minutes. After each stoppage, all accumulated traffic for that direction must pass through the work zone before another stoppage is made.

The maximum length of a single stationary lane closure along Rush Landing Road is 600 feet.

Not more than 1 stationary lane closures will be allowed in each direction of travel at one time.

Personal vehicles of your employees must not be parked on the traveled way or shoulders, including sections closed to traffic.

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

At each location where falsework is constructed over a street or route listed, provide openings through the bridge falsework. The type, minimum width, height, and number of openings at each location, and the location and maximum spacing of the falsework lighting, if required for each opening, must comply with the requirements shown in the table. The width of vehicular openings is the clear width between temporary railings or other protective work. The spacing shown in the table for falsework pavement lighting is the maximum distance from center to center, in feet, between fixtures.

North Novato Overhead, Rush Landing Road, RTE 101

	Number	Width (feet)	Height (feet)
Vehicle openings	1	22	15
Pedestrian openings	0	N/A	N/A
	Location	Spacing	
Falsework pavement lighting	R and L	30 staggered 1/2 space	

NOTE:

R = Right side of traffic

L = Left side of traffic

C = Centered overhead

North Novato Overhead, SMART Track Line, RTE 101

	Number	Width (feet)	Height (feet)
Vehicle openings	1	21	20.50
Pedestrian openings	N/A	N/A	N/A

The exact location of openings will be determined by the Engineer.

Have the necessary materials and equipment on site to erect or remove the falsework in any 1 span or over any 1 opening before detouring or stopping traffic.

Add to section 12-4.03:

For each 10-minute interval or fraction thereof past the time specified to reopen the closure, the Department will deduct the amount per interval shown below from moneys due or that may become due the Contractor under the Contract. Damages are limited to 5 percent of the project cost per occurrence. Damages will not be assessed if the Engineer orders that the closure remain in place beyond the scheduled pickup time.

Type of facility	Route or segment	Period	Damages/interval (\$)
Mainline	101	1st half hour 2nd half hour 2nd hour and beyond	\$1,000 / 10 minutes \$1,500 / 10 minutes \$2,000 / 10 minutes

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	H xx	xxx					
	x	xx	xx	SD xx	xxx					
				x	H xx					
				x	SD xx					
					x	H xx				
						SD xx				
						x	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 4:00am.
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 12:00am.
H	Designated holiday
SD	Special day

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

Chart no. 1 Freeway/Expressway Lane Requirements																										
County: Marin					Route/Direction: 101/NB										PM: R22.2/24.1											
Closure limits: From 0.2 Mile North of Atherton Avenue OC to 1.4 miles south of Redwood Landfill 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
Fridays		1	1	1	1	1	1																			1
Saturdays		1	1	1	1	1	1	1																		1
Sundays		1	1	1	1	1	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:																										

Chart no. 2 Freeway/Expressway Lane Requirements																										
County: Marin					Route/Direction: 101/SB										PM: R22.2/24.1											
Closure limits: From 1.4 miles South of Redwood Landfill OC to 0.2 mile North of Atherton Avenue 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
Fridays		1	1	1	1	1																				1
Saturdays		1	1	1	1	1	1																			1
Sundays		1	1	1	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 12-4.05F with:

Chart no. 3 Conventional Highway Lane Requirements																									
County: Marin	Route/Direction: Rush Landing Road										PM: N/A														
Closure limits: North Novato OH																									
From hour to hour	24	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Mondays through Thursdays							R	R	R	R	R	R	R	R	R	R	R	R	R	R	R				
Fridays							R	R	R	R	R	R	R	R	R	R	R	R	R	R	R				
Saturdays							R	R	R	R	R	R	R	R	R	R	R	R	R	R	R				
Sundays							R	R	R	R	R	R	R	R	R	R	R	R	R	R	R				
Legend:																									
R	Provide at least 1 through traffic lane, not less than 10 feet in width, for use by both directions of travel (Reversing Control)																								
□	Work allowed within the roadway where shoulder or lane closure is not required																								
REMARKS:																									

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

Chart no. 4 Complete Local Street Closure Hours																										
County: Marin					Route/Direction: Rush Landing Road										PM: N/A											
Closure limits: North Novato OH																										
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
Fridays		C	C	C	C																					C
Saturdays		C	C	C	C																					C
Sundays		C	C	C	C																					C
<p>Legend:</p> <p><input type="checkbox"/> C Conventional highway may be closed completely</p> <p><input type="checkbox"/> No complete conventional highway closure is allowed</p>																										
<p>REMARKS:</p> <ul style="list-style-type: none"> - This chart shall be used only for the following: <ol style="list-style-type: none"> 1. Falsework Erection 2. Falsework Removal 3. West Barrier and Overhang Removal 4. East Barrier Removal - Closures shall not exceed 4 nights total. 																										

Add section 12-4.06:

12-4.06 VEHICULAR TRAFFIC PLAN

12-4.06A General

12-4.06A(1) Summary

Section 12-4 includes specifications for providing a vehicular traffic plan (VTP) to regulate your vehicles exiting and entering the median of Route 101 within the project limits.

12-4.06A(2) Submittals

Submit VTP at least 10 working days before the start of work.

Include the narrative, plans, and associated details for each deceleration/acceleration area.

VTP must meet the following requirements:

1. The acceleration and deceleration areas must be parallel with Route 101 traffic where construction vehicles are exiting from and entering to the median work areas. These locations must be a minimum 11 feet wide, paved with a minimum of 4" HMA.
2. The acceleration and deceleration areas must have a minimum distance of 1100 feet, including taper, and must have clear line of sight for Route 101 traffic. Tapers must be designed under the Caltrans Highway Design Manual.
3. Five-axle trucks or larger entering or existing center median without COZEEP support will not be allowed without approval by the Engineer.

12-4.06A(3) Quality Control and Assurance

Ensure that all equipment and vehicle operators understand and follow the approved VTP.

Do not allow trucks to enter into or exit from the median without approved lane closures or without the VTP.

12-4.06B Materials

Not Used

12-4.06C Construction

Install warning signs and traffic control devices as necessary and as ordered by the Engineer to inform the motorists of the movements of construction-related vehicles.

12-4.06D Payment

Payment for preparing the VTP, constructing, maintaining, and eventual removal of the access areas, including signs, is included in the contract items of work involved and no additional compensation will be allowed therefor.

Replace section 12-5 with:

12-5 TRAFFIC CONTROL SYSTEM FOR LANE CLOSURE

12-5.01 GENERAL

Section 12-5.02 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.

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

For multilane freeway or expressway lane closures, do not place the 1,700-foot tangent section shown along lane lines between the 1,000-foot lane closure tapers.

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.

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

Temporary traffic stripe tape must be one of the types of temporary, removable striping tape on the Authorized Material List.

12-8.02E Temporary Traffic Stripe Paint

Not Used

12-8.02F Temporary Pavement Marking Tape

Temporary pavement marking tape must be one of the types of temporary, removable pavement marking tape on the Authorized Material List and must be applied and removed as specified for applying and removing temporary, removable traffic stripe tape.

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

Temporary pavement markers must be one of the temporary pavement markers on the Authorized Material List for long term day/night use, 180 days or less.

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.

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

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

12-8.03D Temporary Traffic Stripe Tape

Apply temporary traffic stripe tape under the manufacturer's instructions. Slowly roll the tape with a rubber-tired vehicle or roller to ensure complete contact with the pavement surface. Apply the tape straight on a tangent alignment and on a true arc on a curved alignment. Do not apply the tape when the air or pavement temperature is less than 50 degrees F unless the installation procedures are authorized beforehand.

The temporary traffic stripe tape must be complete in place at the location shown before opening the traveled way to traffic.

12-8.03E Temporary Traffic Stripe Paint

Apply 1 or 2 coats of temporary traffic stripe paint for new or existing pavement.

The painted temporary traffic stripe must be complete in place at the location shown before opening the traveled way to traffic. Removal of painted temporary traffic stripe is not required.

12-8.03F Temporary Pavement Marking Tape

Apply temporary pavement marking tape at the locations shown. The tape must be complete in place at the location shown before opening the traveled way to traffic.

12-8.03G Temporary Pavement Marking Paint

Apply and maintain temporary pavement markings consisting of painted pavement markings at the locations shown. The painted temporary pavement marking must be complete in place at the location shown before opening the traveled way to traffic. Removal of painted temporary pavement marking is not required.

Apply 1 or 2 coats of temporary pavement marking paint for new or existing pavement.

12- 8.03H Temporary Pavement Markers

Place temporary pavement markers under the manufacturer's instructions. Cement the markers to the surfacing with the manufacturer's recommended adhesive, except do not use epoxy adhesive in areas where removal of the pavement markers is required.

You may use retroreflective pavement markers specified in section 85 instead of temporary pavement markers for long term day/night use, 180 days or less, except to simulate patterns of broken traffic stripe. Retroreflective pavement markers used for temporary pavement markers must comply with section 85, except the waiting period before placing pavement markers on new HMA surfacing as specified in section 85-1.03 does not apply. Do not use epoxy adhesive to place pavement markers in areas where removal of the pavement markers is required.

Temporary pavement markers must be complete in place before opening the traveled way to traffic.

12-8.04 PAYMENT

Not Used

AA

Regulated species name	Protective radius
Nesting non-raptors	50 feet
Nesting Raptors	300 feet

14-6.02C(3) Protocols

Outside of the anticipated bird nesting period specified in section 14-6.03, remove all nests and prevent birds from nesting on the existing and new permanent and temporary structures during construction.

Submit 2 copies of a Bird Nesting Removal and Prevention Plan for review 15 days after contract approval. If revisions are required, revise and resubmit the plan within 10 days of receipt of the Engineer's comments. The plan must describe:

1. Requirements of plan implementation
2. Locations of work
3. Nesting removal, prevention, inspection and maintenance methods
4. Equipment and materials to be used
5. Schedule for removing nests and installing exclusion devices

Submit a copy of the inspection records of nesting removal and prevention for the previous week no later than the following Tuesday.

Remove unoccupied nests by mechanical or hydrological means. Dispose of the removed nests.

Nest removal must comply with section 5-1.20B(4), and section 13.

After the nests are removed, prevent birds from nesting by installing heavy delta knotless netting, ½-inch square mesh, or alternative exclusion devices.

Every other day, inspect exclusion devices and check for any signs of nesting. Maintain, repair and replace the devices to correct any problem discovered within 24 hours. Remove unoccupied new or partially built nests. Keep a written inspection record of time, date, condition, and any action taken.

Notify the Engineer upon discovery of an occupied nest on any structure and immediately stop the work within the protective radius as defined in section 14-6.03. Do not resume work until directed by the Engineer.

Remove all exclusion devices. Exclusion device removal must comply with section 5-1.20B(4).

14-6.02C(5) Protection Measures

Reserved

14-6.02D Payment

Not Used

Replace 2nd paragraph of section 14-6.03 with:

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

Replace item 1 in the list in the 6th paragraph of section 14-6.03 with:

Stop all work within a 100-foot radius of the discovery except as shown in the following table:

Radius Exceptions

Species	Work stoppage radius (feet)
Nesting non-raptors	50 feet
Nesting Raptors	300 feet

Replace the 1st paragraph of section 14-8.02 with:

Do not exceed 86 dBA LMax at 50 feet from the job site activities from 9 p.m. to 6 a.m.

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 excavating, stockpiling, transporting, placing, and disposing of material containing hazardous waste concentrations of Aerially Deposited Lead (ADL). Handle material containing nonhazardous waste concentrations of lead under section 7-1.02K(6)(j)(iii).

ADL is present within the project limits.

The Department has received from the DTSC a variance regarding the use of material containing ADL. The variance applies if the project includes Type Y-1 or Y-2 material. The variance is available for inspection at the Department of Transportation, District 4, 111 Grand Avenue, Oakland, CA 94612.

Comply with section 19.

14-11.03A(2) Definitions

Type Y-1: Material that contains ADL in average concentrations (using the 90 percent Upper Confidence Limit) of 1.5 mg/L or less extractable lead (based on a modified waste extraction test using deionized water as the extractant) and 1,411 mg/kg or less total lead. This material is a California hazardous waste that may be reused as permitted under the variance of the DTSC provided that the lead contaminated soil is placed a minimum of 5 feet above the maximum historic water table elevation and covered with at least 1 foot of non-hazardous soil.

Type Y-2: Material that contains ADL in average concentrations (using the 90 percent Upper Confidence Limit) that exceed either 1.5 mg/L extractable lead (based on a modified waste extraction test using deionized water as the extractant) or 1,411 mg/kg total lead but are less than 150 mg/L extractable lead (based on a modified waste extraction test using deionized water as the extractant) and less than 3,397 mg/kg of total lead. This material is a California hazardous waste that may be reused as permitted under the variance of DTSC provided that the lead contaminated soil is placed a minimum of 5 feet above the maximum historic water table elevation and protected from infiltration by a pavement structure which will be maintained by the Department.

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 CA hazardous waste and must be transported to and disposed of at a CA Class I disposal site.

Type Z-3: Material that contains ADL in average concentrations (using the 95 percent Upper Confidence Limit) greater than 5.0 mg/L soluble lead, (as tested using the Toxicity Characteristic Leaching Procedure). This material is a Department-generated federal hazardous waste and must be transported to and disposed of at a CA Class I disposal site.

14-11.03A(3) Site Conditions

Portions of the site investigation report are included in the "Material Information" handout. The complete report, entitled "Preliminary Site Investigation Report, US 101 Marin-Sonoma Narrows Segment A3, Marin County, California," is available for inspection at the Department of Transportation, 111 Grand Avenue, Oakland, CA, 94612.

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. Minor changes to or clarifications of the initial submittal may be made and attached as amendments to the Excavation and Transportation Plan within 7 days of receipt of the Engineer's comments. 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 hazardous waste concentrations of ADL. The plan must comply with the regulations of the DTSC and Cal/OSHA and the requirements of the variance. 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. Survey methods for Type Y-1 material burial locations
3. Transportation equipment and routes
4. Method for preventing spills and tracking material onto public roads
5. Truck waiting and staging areas
6. Spill Contingency Plan for material containing ADL.

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

Within 5 business days of completing placement of Type Y-1 material at a burial location, submit a report for that burial location, including form CEM-1901, "Burial Location of Soil Containing Aerial Deposited Lead," and electronic geospatial vector data shapefiles of the top and bottom perimeters of the burial location to the Engineer and to the following email address:

ADL@dot.ca.gov

The Engineer will notify you of acceptance or rejection of the burial location report within 5 business days of receipt. If the report is rejected, you have 5 business days to submit a corrected report.

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

Copies of the bills of lading must be provided to the Engineer upon placement of Type Y-1 material in its final location.

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. Department of Resources Recycling and Recovery
8. RWQCB, Region San Francisco Bay Region

9. State Air Resources Control Board
10. Bay Area Air Quality Management 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) Type of Material

Type Y-1 material exists as shown. Place material as shown and cover with a minimum 1 foot layer of nonhazardous soil or the pavement structure. Temporary surplus material may be generated on this project due to the requirements of stage construction. Do not transport temporary surplus outside the job site. It may be necessary to:

1. Stockpile material for subsequent stages.
2. Construct some embankments out of stage.
3. Handle temporary surplus material more than once.

14-11.03C(3) Dust Control

Excavation, transportation, placement, and handling of material containing ADL must result in no visible dust migration. Have a water truck or tank on the job site at all times while clearing and grubbing and 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

Survey the location of the bottom and top perimeters of each area where you bury Type Y-1 material (burial locations). The survey must be performed by or under the direction of one of the following:

1. Land surveyor licensed under the Bus & Prof Code, Chp 15 (commencing with § 8700)
2. Civil engineer licensed prior to January 1, 1982 under the Bus & Prof Code, Chp 7 (commencing with § 6700)

Survey 10 points to determine each burial location horizontally and vertically within the specified accuracies and to create closed polygons of the perimeters of the bottom and top of the burial location. If 10 points are not sufficient to define the polygon, add additional points until the polygon is defined. Establish the position of the bottom and top perimeters before placing subsequent layers of material that obstruct the location.

Report each burial location in California State Plane Coordinates in US Survey feet within the appropriate zone of the California Coordinate System of 1983 (CCS83) and in latitude and longitude. Horizontal positions must be referenced to CCS83 (epoch 2007.00 or later National Geodetic Survey [NGS] or California Spatial Reference Center [CSRC] published epoch) to an accuracy of 3 feet horizontally. The elevation of points identifying the burial location must locate the bottom and top of Type Y-1 material to an accuracy of 1 foot vertically. Elevations of the bottom and top of Type Y-1 material must be referenced to North American Vertical Datum of 1988 (NAVD88). Report accuracy of spatial data in US Survey feet under Federal Geographic Data Committee (FGDC)-STD-007.1-1998.

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. Transportation routes for Type Y-1 or Y-2 material must only include the highway.

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 cubic yards 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.

Quantities of roadway excavation (aerially deposited lead) and structure excavation (aerially deposited lead) will be measured and paid for in the same manner specified for roadway excavation and structure excavation under section 19.

No payment for stockpiling of material containing ADL will be made, unless the stockpiling is ordered. No payment for sampling and analysis will be made unless it is ordered. You are responsible for all additional sampling and analysis costs 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 roadside sign, metal beam guard railing, and thrie beam barrier is TWW. Manage TWW under 22 CA Code of Regs, Div. 4.5, Chp. 34.

14-11.09A(2) Submittals

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

14-11.09B Materials

Not Used

14-11.09C Construction

14-11.09C(1) General

14-11.09C(2) Training

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

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

Maintain records of personnel training for 3 years.

14-11.09C(3) Storage

Store TWW before disposal using the following methods:

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

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

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

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

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

14-11.09C(4) Transporting and Disposal

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

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

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

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

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

Dispose of TWW within:

1. 90 days of generation if stored on blocks
2. 180 days of generation if stored on a containment surface or pad
3. 1 year of generation if stored in a water-resistant container, or within 90 days after the container is full, whichever is shorter

4. 1 year of generation if storing in a storage building as defined in 22 CA Code of Regs, Div. 4.5, Chp. 34, § 67386.6(a)(2)(C)

14-11.09D Payment

Not Used

Replace section 14-11.10 with:

14-11.10 DISPOSAL OF ELECTRICAL EQUIPMENT REQUIRING SPECIAL HANDLING

14-11.10A General

14-11.10B Summary

Vehicle sensor nodes (VSNs) contain lithium thionyl chloride (LTC) batteries. Thionyl chloride is designated as an extremely hazardous waste under Title 22, Division 4.5, Chapter 11, Article 5, Appendix 10 of the California Code of Regulations. Each VSN includes one integral LTC battery.

14-11.10C Construction

Not used

14-11.10D Transportation and Disposal

Package removed VSNs containing undamaged LTC batteries in sealed shipping containers and transport to the manufacturer for disposal. Notify the manufacturer 48 hours before delivery. Affix a label on packages of intact VSN that states the package contains lithium thionyl chloride batteries.

Shipments of batteries returned to the manufacturer that are separated from a VSN must comply with the requirement of 49 CFR 173.185 "Lithium Batteries and Cells." All batteries must be packaged in such a manner that prevents short circuits under conditions normally encountered during transportation.

1. Cover battery ends to prevent them from touching one another
2. Place batteries in sealed plastic bags and pack with loose fill, such as vermiculite, to prevent accidental contact.

The outer packaging must comply with 49 CFR 173.24, "General requirements for packaging and packages," and 173.24a, "Additional general requirements for non-bulk packaging and packages."

You are the generator of and responsible for cleanup, management, disposal and associated costs of hazardous waste generated as a result of mishandling electrical equipment.

14-11.10E Payment

Not used

Add to section 14-11:

14-11.11 SAMPLING AND REMOVAL OF ASBESTOS CONTAINING MATERIALS

14-11.11A General

14-11.11A(1) Summary

Section 14-11.50 includes specifications for inspection for asbestos-containing material (ACM), sample collection and analysis of suspected ACM, regulatory notification, ACM removal, and ACM disposal.

14-11.11A(2) Definitions

asbestos: Includes chrysotile, amosite, crocidolite, tremolite, anthrophyllite, actinolite and any of these minerals that has been chemically treated and/or altered.

asbestos-containing material (ACM): Any building material, including asbestos cement pipe containing commercial asbestos in an amount greater than 1% by weight, area, or count.

certified asbestos consultant (CAC): An asbestos consultant certified by the Division of Occupational Safety and Health under 8 Code of Regulations, Sections 341.15 and 1529.

certified industrial hygienist: A person certified in the practice of industrial hygiene by the American Board of Industrial Hygiene.

friable ACM: Any material containing more than 1 percent (%) asbestos by area that hand pressure can crumble, pulverize or reduce to powder when dry".

non-friable ACM: Asbestos fibers are tightly bound into the matrix of the material and should not become an airborne hazard as long as the material remains intact and undamaged, and is not sawed, sanded, drilled or otherwise abraded during removal (Asbestos Hazard Emergency Response Act (AHERA)).

14-11.11A(3) Asbestos Survey

Asbestos was detected as chrysotile asbestos in non-friable sheet packing used as shims on the bridge barrier rail system on the North Novato Overhead (Br. No. 27-0094R). All other suspected areas do not have ACM. Portions of the survey report are included in the "Information Handout." The complete report entitled "Limited Asbestos and Deteriorated Lead-Containing Paint Survey Report – North Novato Overhead (27-0094R), 04-MRN-101, Post Mile 22.30, Marin County, California" is available in the Information Handout.

14-11.11A(4) Submittals

14-11.11A(4)(a) Air Quality Management District (AQMD) or Air Pollution Control District (APCD) Notification of Demolition

Provide a copy of the required notification form and attachments to the Engineer before submittal to the AQMD or APCD. Submit a NESHAP Notification under section 14-9.02.

14-11.11A(4)(b) Asbestos Compliance Plan

Prepare an Asbestos Compliance Plan (ACP) to prevent or minimize exposure to asbestos. The ACP must be signed by an American Board-certified industrial hygienist before submission to the Engineer for review and acceptance. Submit the ACP to the Engineer at least 15 business days before beginning work in areas containing or suspected to contain asbestos. The ACP must comply with section 7-1.01A, "Labor Code Requirements" of the Standard Specifications and contain as a minimum:

1. Identification of key personnel for the project
2. Scope of Work and equipment that will be used
3. Job hazard analysis for work assignments
4. Summary of risk assessment
5. Personal protective equipment
6. Delineation of work zones on-site
7. Decontamination procedures
8. General safe work practices
9. Security measures
10. Emergency response plans
11. Worker training

14-11.11A(4)(c) Removal Work Plan

Prepare a work plan for the removal, storage, transportation, and disposal of ACM. Removal and management of ACM must be performed by a contractor registered under section 6501.5 of the Labor Code and certified under section 7058.6 of the Business and Professions Code.

Asbestos removal procedures include:

1. Installing asbestos warning signs at perimeters of abatement work areas.
2. Wetting asbestos materials with sprayers.
3. Containing large volumes of asbestos materials in disposal bins for temporary storage until removed from the site.
4. Providing manifests for disposal upon completion for the Engineer to sign.
5. Providing transporters registered to transport hazardous waste in the state of California under the Health and Safety Code Ch 6.5, Div 20 and 22 Code of Regs, Div 4.5.
6. Disposing of asbestos materials at a permitted disposal facility.
7. Working in accordance with federal, state, and local requirements for asbestos work.

14-11.11A(5) Quality Control and Assurance

14-11.11A(5)(a) Qualifications

The person in charge of asbestos inspection and abatement planning must be a certified asbestos consultant.

The person in charge of asbestos removal must be registered under Labor Code § 6501.5 and certified under Bus & Prof Code § 7058.6.

14-11.11A(5)(b) Regulatory Requirements

Codes, which govern removal and disposal of materials containing asbestos include:

1. California Health and Safety Code, Division 20, Chapter 6.5, Hazardous Waste Control.
2. California Code of Regulations, Title 8, General Industry Safety Order 5208 Asbestos.
3. California Code of Regulations, Title 8, Sections 1529 and 341
4. California Code of Regulations, Title 22, Division 4.5
5. Occupational Safety and Health Administration, Part 26 (amended), of Title 29 of the Code of Federal Regulations.
6. Code of Federal Regulations (CFR), Title 40, Part 61, subpart M.

Notify the APCD or the AQMD of changes to removal or demolition plans, including discovery of ACM during demolition, within 2 business days of the change.

Notify the Division of Occupational Safety and Health under 8 CA Code of Regs § 341.9.

14-11.11A(5)(c) Training, Equipment and Medical Surveillance

Before starting work in areas containing or suspected to contain asbestos, personnel who have no prior training or are not current in their training status, including State personnel in the work area, must complete a safety training program that meets the requirements of 8 CA Code of Regs § 1529. Provide a written certification of completion of safety training for trained personnel before starting work in areas containing or suspected to contain asbestos.

Provide training, personal protective equipment, and medical surveillance required by the Asbestos Compliance Plan to 2 State personnel.

14-11.11B Materials

Not used

14-11.11C Construction

14-11.11C(1) Asbestos Inspection (Bridge Removal)

Complete an inspection to determine if ACM or suspected ACM is present within the structure at least 30 days before starting bridge removal. Submit the name of the laboratory that will perform the asbestos analysis and copy of the ELAP certification with fields of testing before beginning any sampling or analysis.

14-11.11C(2) Suspected ACM discovered during demolition or excavation

If suspected ACM is discovered during demolition, the portion of the work that involves the suspected ACM must be performed by or under the direction of licensed and certified personnel. Test the suspected ACM in compliance with USEPA Asbestos/NESHAP Regulated Asbestos Containing Materials Guidance.

14-11.11C(3) Removal

Comply with 8 CA Code of Regs § 1529 and § 341. Remove friable ACM using the wetting method. Remove and handle all non-friable ACM to prevent breakage. Non-friable ACM such as asbestos cement pipe must be disposed of to a landfill facility permitted to accept ACM. The removal of ACM encased in concrete or other similar structural material is not required before demolition, but must be adequately wetted whenever exposed during demolition. Prevent visible emissions from all ACM removal activities.

Mark all regulated work areas with the following or equivalent warning:

**DANGER
ASBESTOS
CANCER AND LUNG DISEASE HAZARD
AUTHORIZED PERSONNEL ONLY**

14-11.11C(4) Packaging

Comply with 22 CA Code of Regs, Div 4.5, Chapter 12, Article 3 requirements for packaging and labeling removed ACM. Place removed ACM in approved containers (double ply, 0.06-inch minimum thickness, plastic bags) with caution labels affixed to bags. Caution labels must have conspicuous, legible lettering, that spells out the following or equivalent warning:

**DANGER
CONTAINS ASBESTOS FIBERS
AVOID CREATING DUST
CANCER AND LUNG DISEASE HAZARD**

The removed materials containing asbestos may be placed directly into a covered, lockable roll off or drop box that has the same caution label affixed on all sides.

14-11.11C(5) Transportation

All haulers of friable ACM must have current registration with the State Department of Toxic Substances Control (DTSC) for transporting hazardous waste and must have a U.S. Environmental Protection Agency Identification Number (U.S. EPA I.D. Number). All vehicles used to transport hazardous waste material must carry a valid registration during transport.

14-11.11C(6) Disposal

Dispose of friable and non-friable waste containing asbestos at a disposal facility permitted to accept the waste and that meets all the requirements specified by federal, state and local regulations. Notify the proper authorities at the disposal site in advance of delivery of ACM. Provide a copy of all waste shipment records to the Engineer within 35 days after shipment.

The Engineer obtains the required EPA generator identification numbers, and will sign the hazardous waste manifests for disposal of friable asbestos containing material. Request a generator identification number from the Engineer at least 5 days before the first shipment.

14-11.11D Payment

Removal, transportation, and disposal of ACM, including inspection, sampling, analysis and removal reports, that is discovered during demolition or excavation is change order work.

Removal work plans and reports, notifications to regulatory agencies and permits, removal, transportation, and disposal of ACM that is shown is included in the payment for the bid items involved.

AA

15 EXISTING FACILITIES

Replace section 15-1.03C with:

15-1.03C Loop Detectors

The existing inductive loop detectors shown at stations J1R 389+50 must remain in place and operational.

If you damage part of a loop conductor including an adjacent loop and the portion leading to the adjacent pull box, replace the entire loop detector.

Replace section 15-2.02B(3) with:

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

15-2.02B(3)(a) General

Schedule cold planing activities so that not more than 7 days elapses between the time the pavement is cold planed and the HMA is placed.

If you do not complete HMA placement before opening the area to traffic, you must:

1. Construct a temporary HMA taper to the level of the existing pavement
2. Place HMA during the next work shift
3. Submit a corrective action plan that shows you will complete cold planing and placement of HMA in the same work shift. Do not restart cold planing activities until the Engineer approves the corrective action plan.

15-2.02B(3)(b) Materials

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

15-2.02B(3)(c) Construction

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

Do not use a heating device to soften the pavement.

The cold planing machine must be:

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

Replace broken, missing, or worn machine teeth.

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

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

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

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

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

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

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

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

Completely remove temporary tapers before placing permanent surfacing.

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

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

15-2.02B(3)(d) Payment

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

Replace section 15-2.02C(2) with:

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

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

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

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

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

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

Replace section 15-2.02F with:

15-2.02F Remove Asphalt Concrete Dikes

You may dispose of the dike by burial in an embankment in the same manner as specified for burying concrete in an embankment in section 15-3.01.

Replace section 15-2.03A(2)(b) with:

15-2.03A(2)(b) Department Salvage Location

A minimum of 2 business days before hauling salvaged material to the Department salvage storage location, notify:

- 1. District Maintenance Yard coordinator at telephone number (415) 289-2951

The salvage storage location is:

Manzanita Maintenance Yard
40 Shoreline Road, Mill Valley, CA, 94941

Add section 15-2.16:

15-2.16 CLEANING CULVERT

15-2.16A General

15-2.16A(1) Summary

Section 15-2.16 includes specifications for cleaning culverts.

15-2.16A(2) Submittals

For each culvert, submit a cleaning plan.

Allow 7 days for the Department's review.

To make changes to an authorized cleaning plan, submit it as specified for a new submittal. Note the changes.

The cleaning plan must include methods for:

1. Cleaning
2. Controlling sediments dislodged during the cleaning
3. Controlling and diverting the existing stream or groundwater flow. The bypass system must have adequate capacity and size. Include:
 - 3.1 Calculations for the existing flows and the capacity of the bypass system
 - 3.2 Schedule for the required use of the bypass system

15-2.16B Materials

Not Used

15-2.16C Construction

Remove all debris, sediment and other accumulated material from the culvert invert and restore the flow area to the original flow area or to the diameter shown.

Dispose of earthy material, trash, cuttings, and other waste material.

Sediment and debris generated as a result of the cleaning operation must be collected within the job site.

Install barriers, cofferdams, or sheet piling toward the downstream end of the culvert.

Clean the culvert with high-velocity cleaning equipment and air mover or mechanically powered equipment. If human entry is possible, you may use nonmechanically powered cleaning equipment.

Within 72 hours of cleaning culvert, remove stream or groundwater flow diverting system and barriers, cofferdams, or sheet piling towards the downstream end of the culvert.

Maintain the culverts free from deposits of earthy material, trash, cuttings and other waste material at your expense.

15-2.16D Payment

Payment for the following work is included in the payment for Cleaning Culvert:

1. Cleaning
2. Disposal of material, trash and cuttings and other waste material
3. Keeping the culvert free of water
4. Keeping the culvert free of debris
5. Diverting the flow of stream or groundwater water away from the culvert
6. Installing and removing stream or groundwater diverting system and barriers, cofferdams, or sheet piling

Produce and place RHMA-G under the standard construction process.

Add to section 39-1.02C:

Asphalt binder used in HMA Type A must be PG 64-16.

Asphalt binder used in HMA-O must be PG 58-34 PM.

Asphalt binder mixed with asphalt modifier and CRM for asphalt rubber binder must be PG 64-16.

Add to section 39-1.02E:

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

Aggregate for HMA-O must comply with the 1/2-inch OGFC gradation.

Treat HMA-O aggregate with the same antistrip treatment used for HMA Type A.

Do not test HMA-O aggregate for plasticity index and tensile strength ratio.

Aggregate for RHMA-G must comply with the 1/2-inch RHMA-G gradation.

Add to section 39-1.03B:

For the mix design of HMA Type A produced under the QC/QA construction process, determine the plasticity index of the aggregate blend under California Test 204. Choose an antistrip treatment and use the corresponding laboratory procedure for the mix design based on the antistrip treatments shown in the following table:

Antistrip Treatment Laboratory Procedures for Mix Design

Antistrip treatment	Laboratory procedure
Plasticity index from 4 to 10 ^a	
Dry hydrated lime with marination	LP-6
Lime slurry with marination	LP-7
Plasticity index less than 4	
Liquid	LP-5
Dry hydrated lime without marination	LP-6
Dry hydrated lime with marination	LP-6
Lime slurry with marination	LP-7

^a If the plasticity index is greater than 10, do not use that aggregate blend.

For the mix design of HMA Type A produced under the QC/QA construction process, determine the tensile strength ratio under California Test 371 on untreated HMA. If the tensile strength ratio is less than 70:

1. Choose from the antistrip treatments specified based on the plasticity index
2. Test treated HMA under California Test 371
3. Treat to a minimum tensile strength ratio of 70

Determine the quantity of asphalt rubber binder to be mixed with the aggregate for RHMA-G under California Test 367 except:

1. Specific gravity used in California Test 367, Section B, "Void Content of Specimen," must be determined under California Test 308, Method A.

2. California Test 367, section C, "Optimum Bitumen Content," is revised as follows:
 - 2.1. Base the calculations on the average of 3 briquettes produced at each asphalt rubber binder content.
 - 2.2. Use California Test 309 to determine theoretical maximum specific gravity and density of the RHMA-G.
 - 2.3. Plot asphalt rubber binder content versus average air voids content based on California Test 309 for each set of three specimens on Form TL-306 (Figure 3), and connect adjacent points with a best-fit curve.
 - 2.4. Plot asphalt rubber binder content versus average Hveem stability for each set of three specimens and connect adjacent points with a best-fit curve.
 - 2.5. Calculate voids in mineral aggregate (VMA) and voids filled with asphalt (VFA) for each specimen, average each set, and plot the average versus asphalt rubber binder content.
 - 2.6. Calculate the dust proportion and plot versus asphalt rubber binder content.
 - 2.7. From the curve plotted in Step 2.3, select the theoretical asphalt rubber binder content that has 4 percent air voids.
 - 2.8. At the selected asphalt rubber binder content, evaluate corresponding voids in mineral aggregate, voids filled with asphalt, and dust proportion to verify compliance with requirements. If necessary, develop an alternate composite aggregate gradation to conform to the RHMA-G requirements.
 - 2.9. Record the asphalt rubber binder content in Step 2.7 as the Optimum Bitumen Content (OBC).
 - 2.10. To establish a recommended range, use the OBC as the high value and 0.3 percent less as the low value. Notwithstanding, the recommended range must not extend below 7.0 percent. If the OBC is 7.0 percent, then there is no recommended range, and 7.0 percent is the recommended value.
3. Laboratory mixing and compaction must comply with California Test 304, except the mixing temperature of the aggregate must be from 300 to 325 degrees F. The mixing temperature of the asphalt-rubber binder must be from 375 to 425 degrees F. The compaction temperature of the combined mixture must be from 290 to 300 degrees F.

Do not test HMA-O aggregate for plasticity index and tensile strength ratio.

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 at each location before placing HMA-O over the existing pavement.

Replace section 39-1.12E of the RSS for section 39-1.12 with:

39-1.12E Prepaving Must-Grinds

Section 39-1.12E applies to existing asphalt concrete areas receiving an HMA overlay of less than 0.25 foot.

Prepaving profilograph includes taking profiles of the existing pavement, determining must-grinds, and submitting profilograms.

Prepaving grinding day includes correcting must-grinds and taking profiles of the corrected areas and submitting profilograms.

Before starting paving operations, determine must-grinds on the existing pavement under California Test 526. Take 2 profiles within each traffic lane, 3 feet from and parallel with the edge of each lane. Profile the pavement in the Engineer's presence.

Submit profilograms and locations of must-grinds.

Notify the Engineer of those must-grinds that cannot be corrected by prepaving grinding. The Engineer responds to your notification within 5 business days.

For those must-grinds that cannot be corrected by grinding, the Engineer may order you to either (1) not correct the must-grinds or (2) correct must-grinds by a different method and take profiles of the corrected areas with a profilograph.

Corrective work not performed by prepaving grinding, including taking profiles of the corrected areas and associated traffic control, is change order work.

Correct prepaving must-grinds that you predict will cause the top layer of HMA to be noncompliant with the smoothness specifications. After correcting prepaving must-grinds, take profiles of the corrected area and submit profilograms.

Dispose of grinding residue.

Pave within 7 days of correcting areas.

The HMA pavement top layer must comply with section 39-1.12. The 2nd paragraph of section 39-1.12A and the 3rd paragraph of section 39-1.12C do not apply regardless of the type of HMA used.

If ordered not to correct prepaving must-grinds, the smoothness specifications do not apply to the top layer of HMA placed in those areas.

Smoothness correction of the top layer of HMA must leave at least 75 percent of the specified HMA thickness. If ordered, core the pavement at the locations determined by the Engineer. Coring, including traffic control, is change order work. Remove and replace deficient pavement areas where the overlay thickness is less than 75 percent of the thickness specified as determined by the Engineer.

Replace the 2nd through 4th paragraphs of section 39-1.15C with:

Spread with a self-propelled spreader. After spreading, minor HMA must be ready for compacting without further shaping.

Compact with a vibratory roller providing a minimum of 7,000 lb centrifugal force. With the vibrator on, compact at least 3 complete coverages over each layer, overlapping to prevent displacement. The speed of the vibratory roller in miles per hour must not exceed the vibrations per minute divided by 1,000. If the layer thickness is less than 0.08 foot, turn the vibrator off. Complete the 1st coverage before the mixture's temperature drops below 250 degrees F.

The finished surface must be:

1. Textured uniformly
2. Compacted firmly
3. Without depressions, humps, and irregularities
4. In compliance with the straightedge specifications for smoothness

Replace section 39-1.17 with:

39-1.17 DATA CORES

39-1.17A General

39-1.17A(1) Summary

This work includes taking data cores and submitting the information.

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

39-1.17A(2) Submittals

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

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

For each data core, the summary must include:

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

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

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

39-1.17B Materials

Not Used

39-1.17C Construction

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

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

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

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

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

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

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

Replace section 39-1.18 with:

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

39-1.18A General

39-1.18A(1) Summary

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

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

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

Replace section 39-1.19 with:

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

39-1.19A General

39-1.19A(1) Summary

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

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

You may reduce the combined aggregate lime ratio for OGFC to 0.5–1.0 percent.

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

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

Replace section 39-1.20 with:

39-1.20 LIQUID ANTISTRIP TREATMENT

39-1.20A General

39-1.20A(1) Summary

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

39-1.20A(2) Submittals

For LAS, submit with the proposed JMF submittal:

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

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

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

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

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

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

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

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

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

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

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

Replace section 39-1.21 with:

39-1.21 REPLACE ASPHALT CONCRETE SURFACING

39-1.21A General

Remove existing asphalt concrete surfacing and underlying base and replace with HMA. The Engineer determines the exact limits of replaced asphalt concrete surfacing.

39-1.21B Materials

HMA for replace asphalt concrete surfacing must be Type A.

Asphalt binder for the HMA must be PG 64-16.

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

39-1.21C Construction

Place replacement HMA under section 39-3.

Replace asphalt concrete in a lane before the lane is specified to be opened to traffic under section 12-4.

Before removing asphalt concrete, outline the replacement area and cut neat lines with a saw or grind to full depth of the existing asphalt concrete. Do not damage asphalt concrete and base remaining in place.

Dispose of removed material.

If the base is excavated beyond the specified plane, replace it with HMA. The Department does not pay for this HMA.

39-1.21D Payment

Replace asphalt concrete surfacing is measured based on the specified dimensions and any adjustments ordered.

You may request authorization to leave rejected replacement HMA in place. If authorized, you must accept a reduction in the payment for the rejected replacement HMA.

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.

Add to section 49-1.03:

Expect difficult pile installation due to the conditions shown in the following table:

Pile location		Conditions
Bridge no.	Support location	
27-0094R	Abutment 1	Dense to very dense soils, soft bay mud overlying dense soils, hazardous waste, contaminated materials, tidal flow fluctuation, high ground water, cobbles and boulders, subsurface concrete debris, traffic control
27-0094R	Bent 2	Dense to very dense soils, soft bay mud overlying dense soils, hazardous waste, contaminated materials, tidal flow fluctuation, high ground water, cobbles and boulders, subsurface concrete debris, low overhead clearance, presence of underground utilities, railroad clearance requirements
27-0094R	Bent 3	Dense to very dense soils, soft bay mud overlying dense soils, hazardous waste, contaminated materials, tidal flow fluctuation, high ground water, cobbles and boulders, subsurface concrete debris, low overhead clearance, presence of underground utilities, railroad clearance requirements, traffic control
27-0094R	Bent 4	Dense to very dense soils, soft bay mud overlying dense soils, hazardous waste, contaminated materials, tidal flow fluctuation, high ground water, cobbles and boulders, subsurface concrete debris, low overhead clearance, presence of underground utilities, traffic control
27-0094R	Abutment 5	Dense to very dense soils, soft bay mud overlying dense soils, hazardous waste, contaminated materials, tidal flow fluctuation, high ground water, cobbles and boulders, subsurface concrete debris, traffic control

Add to section 49-2.01A(3)(b):

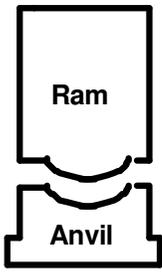
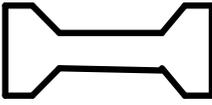
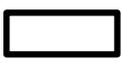
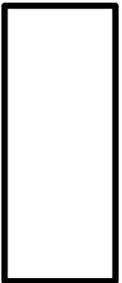
Before installing driven piles, submit a driving system submittal for each pile type for each of the support locations or control zones shown in the following table:

Bridge no.	Pile type	Support location or control zone
27-0094R	72" Cast-in-steel-shell Concrete Pile	Abutment 1
27-0094R	72" Cast-in-steel-shell Concrete Pile	Abutment 5

CALIFORNIA DEPARTMENT OF TRANSPORTATION
TRANSPORTATION LABORATORY

PILE AND DRIVING DATA FORM

Structure Name : _____ Contract No.: _____
 _____ Project: _____
 Structure No.: _____ Pile Driving Contractor or
 Dist./Co./Rte./Post Mi: _____ Subcontractor _____ (Pile Driven By)

	Hammer	Manufacturer: _____ Model: _____ Type: _____ Serial No.: _____ Rated Energy: _____ at _____ Length of Stroke _____ Modifications: _____ _____ _____				
	Capblock (Hammer Cushion)	Material: _____ Thickness: _____ in Area: _____ in ² Modulus of Elasticity - E: _____ ksi Coefficient of Restitution - e: _____				
	Pile Cap	<table border="1" style="display: inline-table; vertical-align: middle;"> <tr><td>Helmet</td></tr> <tr><td>Bonnet</td></tr> <tr><td>Anvil Block</td></tr> <tr><td>Drivehead</td></tr> </table> Weight: _____ kips	Helmet	Bonnet	Anvil Block	Drivehead
Helmet						
Bonnet						
Anvil Block						
Drivehead						
	Pile Cushion	Material: _____ Thickness: _____ in Area: _____ in ² Modulus of Elasticity - E: _____ ksi Coefficient of Restitution - e: _____				
	Pile	Pile Type: _____ Length (In Leads): _____ ft Lb/ft.: _____ Taper: _____ Wall Thickness: _____ in Cross Sectional Area: _____ in ² Design Pile Capacity: _____ kips Description of Splice: _____ _____ Tip Treatment Description: _____ _____				

DISTRIBUTE:

Translab,
Foundation Testing

Translab,
Geotechnical Design

Resident Engineer

Note: If mandrel is used to drive the pile, attach separate manufacturer's detail sheet(s) including weight and dimensions.

Submitted By: _____
 Date: _____ Phone No.: _____

Aggregate for grout must be commercial quality concrete sand.

83-1.02B(1)(a)(iii) Landscape Fabric

Landscape fabric must be manufactured from thermally spun bonded polypropylene fabric and must comply with the requirements shown in the following table:

Property	Minimum requirement
Grab tensile strength	135 lb
Grab elongation	70%
UV resistance	70% @ 150 hours
Weight	3 ounces per square yard

Staples for landscape fabric must be 2 inches in width, 6 inches in length, and 11-gauge wire.

Submit a copy of the manufacturer's material sheet, together with instructions for installation 5 business days before installation.

Submit a certificate of compliance for landscape fabric.

83-1.02B(1)(b) Site Preparation

83-1.02B(1)(b)(i) Clearing

Areas to receive vegetation control must be cleared of trash and debris under section 16 and these special provisions.

Vegetation must be removed to the ground. Dispose of cleared trash, debris, and removed vegetation.

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

Earthwork must comply with the specifications in section 19 and these special provisions.

After clearing, areas to receive vegetation control must be excavated. 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 0.17 foot before removing the surfacing. The area to receive vegetation control must be excavated to maintain planned flow lines, slope gradient, and contours of the job site.

After excavation, areas to receive vegetation control must be graded to a smooth, uniform surface and compacted to a relative compaction of not less than 90 percent.

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

83-1.02B(1)(c) Placement

Landscape fabric must be stapled to prevent shifting during concrete placement. Fabric must lie flat, smooth, without bulges or wrinkles, and maintain uniform contact with the soil surface.

Grout must be spread to completely fill voids as shown on the plans.

Minor concrete must be struck off and compacted until a layer of mortar has been brought to the surface. Minor concrete must receive a broom finish.

Two weakened plane joints must be constructed in the minor concrete at each post location, perpendicular to the rail and in line with the edge of the grout. The joints must be constructed to a minimum depth of 1 inch by scoring with a tool that will leave the corners rounded and ensure free movement of concrete at the joint.

The finished grade of vegetation control must be uniform; maintaining planned flow lines, slope gradient, and contours of the job site.

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 on the plans.

Replace section 83-1.02C(2) with:

83-1.02C(2) Alternative In-Line Terminal System

Alternative in-line terminal system must be furnished and installed as shown on the plans and under these special provisions.

The allowable alternatives for an in-line terminal system must consist of one of the following or a Department-authorized equal.

1. TYPE SKT TERMINAL SYSTEM - Type SKT terminal system must be a SKT 350 sequential kinking terminal manufactured by Road Systems, Inc., located in Big Spring, Texas, and must include items detailed for Type SKT terminal system shown on the plans. The SKT 350 sequential kinking terminal can be obtained from the distributor, Universal Industrial Sales, P.O. Box 699, Pleasant Grove, UT 84062, telephone (801) 785-0505 or from the distributor, Gregory Highway Products, 4100 13th Street, S.W., Canton, OH 44708, telephone (330) 477-4800.
2. TYPE ET TERMINAL SYSTEM - Type ET terminal system must be an ET-2000 PLUS (4-tube system) extruder terminal as manufactured by Trinity Highway Products, LLC, and must include items detailed for Type ET terminal system shown on the plans. The ET-2000 PLUS (4-tube system) extruder terminal can be obtained from the manufacturer, Trinity Highway Products, LLC, P.O. Box 99, Centerville, UT 84012, telephone (800) 772-7976.

Submit a certificate of compliance for terminal systems.

Terminal systems must be installed under the manufacturer's installation instructions and these specifications. Each terminal system installed must be identified by painting the type of terminal system in neat black letters and figures 2 inches high on the backside of the rail element between system posts numbers 4 and 5.

For Type ET terminal system, the steel foundation tubes with soil plates attached must be, at the Contractor's option, either driven, with or without pilot holes, or placed in drilled holes. Space around the steel foundation tubes must be backfilled with selected earth, free of rock, placed in layers approximately 4 inches thick and each layer must be moistened and thoroughly compacted. The wood terminal posts must be inserted into the steel foundation tubes by hand and must not be driven. Before the wood terminal posts are inserted, the inside surfaces of the steel foundation tubes to receive the wood posts must be coated with a grease that will not melt or run at a temperature of 149 degrees F or less. The edges of the wood terminal posts may be slightly rounded to facilitate insertion of the post into the steel foundation tubes.

For Type SKT terminal system, the soil tubes must be, at the Contractor's option, driven with or without pilot holes, or placed in drilled holes. Space around the steel foundation tubes must be backfilled with selected earth, free of rock, placed in layers approximately 4 inches thick and each layer must be moistened and thoroughly compacted. Wood posts must be inserted into the steel foundation tubes by hand. Before the wood terminal posts are inserted, the inside surfaces of the steel foundation tubes to receive the wood posts must be coated with a grease that will not melt or run at a temperature of 149 degrees F or less. The edges of the wood posts may be slightly rounded to facilitate insertion of the post into the steel foundation tubes.

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

Replace section 83-1.02C(3) with:

83-1.02C(3) Alternative Flared Terminal System

Alternative flared terminal system must be furnished and installed as shown on the plans and under these special provisions.

The allowable alternatives for a flared terminal system must consist of one of the following or a Department-authorized equal.

1. TYPE FLEAT TERMINAL SYSTEM - Type FLEAT terminal system must be a Flared Energy Absorbing Terminal 350 manufactured by Road Systems, Inc., located in Big Spring, Texas, and must include items detailed for Type FLEAT terminal system shown on the plans. The Flared Energy Absorbing Terminal 350 can be obtained from the distributor, Universal Industrial Sales, P.O. Box 699, Pleasant Grove, UT 84062, telephone (801) 785-0505 or from the distributor, Gregory Industries, Inc., 4100 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 shown on the plans. The SRT-350 Slotted Rail Terminal (8-post system) can be obtained from the manufacturer, Trinity Highway Products, LLC, P.O. Box 99, Centerville, UT 84012, telephone (800) 772-7976.

Submit a certificate of compliance for terminal systems.

Terminal systems must be installed under the manufacturer's installation instructions and these specifications. Each terminal system installed must be identified by painting the type of terminal system in neat black letters and figures 2 inches high on the backside of the rail element between system posts numbers 4 and 5.

For Type SRT terminal system, the steel foundation tubes with soil plates attached must be, at the Contractor's option, either driven, with or without pilot holes, or placed in drilled holes. Space around the steel foundation tubes must be backfilled with selected earth, free of rock, placed in layers approximately 4 inches thick and each layer must be moistened and thoroughly compacted. The wood terminal posts must be inserted into the steel foundation tubes by hand and must not be driven. Before the wood terminal posts are inserted, the inside surfaces of the steel foundation tubes to receive the wood posts must be coated with a grease that will not melt or run at a temperature of 149 degrees F or less. The edges of the wood terminal posts may be slightly rounded to facilitate insertion of the post into the steel foundation tubes.

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.

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

Add to section 83-2.02D(1):

Bar reinforcing steel for use in concrete barriers must be epoxy coated under section 52-2.03.

Where shown, construct concrete barriers on a layer of Class 2 aggregate base. Aggregate base must comply with section 26. Adjust the height of the barriers to allow for irregularities in the surface of the finished aggregate base. The adjustment amount will be ordered before the concrete is placed.

AA

84 TRAFFIC STRIPES AND PAVEMENT MARKINGS

Replace the 2nd paragraph in section 84-2.03B with:

Apply thermoplastic for traffic stripes by the ribbon extrusion method in a single pass. Apply the thermoplastic at a rate of at least 0.34 lb/ft of 4-inch-wide solid stripe. The applied thermoplastic must be at least 0.100 inch thick.

AA

86 ELECTRICAL SYSTEMS

Add to section 86-1.01:

Communication conduit is included in the following structure:

1. North Novato OH, Br No. 27-0094R

Add to section 86-1.03:

Submit a schedule of values within 15 days after Contract approval.

Add to the 4th paragraph of section 86-1.03:

13. Vehicle Sensor Nodes
14. Cabinet for Traffic Monitoring Station

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Add to section 86-2.05A:

Conduit installed underground must be Type 1 or 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 1.

Add to section 86-2.05C:

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

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

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

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

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

The final 2 feet of conduit entering a pull box in a reinforced concrete structure may be Type 4.

Delete items 2–5 in the list in the 2nd paragraph of section 86-2.06A(2).

Add to section 86-2.06A(2):

Do not place grout in the bottom of the pull box.

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 30 Rickard Street, San Francisco, CA 94134.

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.

Add to section 86-2.08A:

Wrap conductors around the projecting end of conduit in pull boxes as shown. Secure conductors and cables to the projecting end of the conduit in pull boxes.

Replace 1st, 6th, and 7th paragraphs of section 86-2.09E with:

Splices must be insulated by "Method B."

Add to section 86-2.11A:

Circuit breakers must be the cable-in/cable-out type mounted on non-energized clips. All circuit breakers must be mounted vertically with the up position of the handle being the "ON" position.

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

Replace 7th and 8th paragraphs of section 86-2.11A with:

Service equipment enclosures must be the aluminum type.

Replace section 86-2.18 with:

86-2.18 NUMBERING ELECTRICAL EQUIPMENT

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

Replace section 86-3.03 with:

86-3.03 GENERAL PACKET RADIO SYSTEM WIRELESS MODEM ASSEMBLY

86-3.03A General

86-3.03A(1) Summary

Section 86.3.03 includes specifications for installing the General Packet Radio System (GPRS) Wireless Modem Assembly at the traffic monitoring station controller cabinet.

The GPRS Wireless Modem Assembly consists of the following major components:

1. Modem
2. Power supply
3. Modem mounting bracket and hardware
4. Serial communication cable
5. Antenna

86-3.03A(2) Abbreviations

APN: Access Point Name

AT: Advanced Technology

IMEI: International Mobile Equipment Identification

IP: Internet Protocol

PCCA: Portable Computer and Communications Association

PDP: Packet Data Protocol

PPP: Point to Point Protocol

SIM: Subscriber Identity Module

TCP: Transmission Control Protocol

UDP: User Datagram Protocol

86-3.03A(3) Submittals

Submit a Certificate of Compliance for each modem and power supply.

For modems and power supplies, submit a 12-month written warranty for parts and labor for defects in materials and workmanship. The 12-month warranty period starts at Contract acceptance.

Provide the modem serial, SIM and IMEI numbers 30 days before requiring the PDP context. The Engineer will make available the PDP context comprising the IP (assigned) and APN (obtained from service provider).

86-3.03A(4) Quality Control and Assurance

Ensure that the modem and associated firmware, software, hardware, protocol, and other features are fully and completely compatible with the existing GPRS network currently in use. The existing GPRS network utilizes the AT&T Wireless cellular system (band compatible with this modem), the AirLink Raven GPRS modem, and the AirLink Gateway. After complete installation, perform compatibility testing in the presence of the Engineer.

Provide replacement modems and power supplies within 5 days after receipt of failed modem and power supply at no cost to the State, except the cost of shipping. Deliver replacement modem and power supplies to Caltrans Maintenance Electrical Shop at 30 Rickard Street, San Francisco, CA 94134, phone (415) 330-6500.

86-3.03B Materials

86-3.03B(1) Modem

86-3.03B(1)(a) General

The modem must:

1. Be configurable remotely through the wireless network and through the modem serial port
2. Be fully compliant with PCCA STD-101
3. Have operating temperature range from -85 to +155 degrees F, with humidity from 5 to 95 percent (non-condensing) and have transmissions at 10 percent duty cycle above 140 degrees F
4. Weigh less than 2 pounds
5. Have overall dimensions of less than 7-1/8 inches × 3-1/2 inches × 1-1/8 inches
6. Have housing constructed of anodized aluminum

The modem must have the following status indicators:

1. Power (on)
2. Channel acquired
3. Link status
4. Network registration
5. Received signal strength indicator
6. Transmit and receive data
7. Block errors

The modem must have the following features:

1. 53.6 kbps raw data transfer rate minimum
2. Full duplex transceiver
3. 1900/850 MHz dual band networking
4. Integrated TCP/IP protocol stack with UDP.
5. User settable password to prevent unauthorized access
6. Include a DC power cable at least 3.25 feet in length with a connector compatible with the modem power connector
7. Packet buffering and forwarding feature that provides discipline to the output of the serial port. The packet forwarding time interval must be configurable from a rate of 0 (undisciplined) to 400 ms in increments of 100 ms or less.
8. Choice of "Friends Only" access mode

86-3.03B(1)(b) Operational Parameters

The modem must operate in a dynamic IP addressing environment of GPRS Networks at 1900/850 MHz and meet the following operational parameters:

Transmit power at antenna port	1.0 W for 1900 MHz 0.8 W for 850 MHz
Receiver sensitivity	-107 dBm (2.439 % bit error rate)
Input voltage	10 to 28 V(dc)
Input current	40 to 200 mA

86-3.03B(1)(c) Application Interfaces

The modem must have the following standard interfaces:

1. The AT command serial character stream uses TCP/IP.
2. Host communicates with modem using either UDP or TCP packet modes.
3. Computer terminal platform using Windows 2000/XP and Dial-Up Networking communicates with the modem using PPP.

86-3.03B(1)(d) Modem Mounting Bracket and Hardware

The mounting bracket and hardware must:

1. Be stainless steel
2. Securely hold the modem in a vertical attitude with all cables and conductors installed
3. Contain the modem using a method that allows the removal of the modem without tools or without removing the bracket from its attachment to the cabinet frame

86-3.03B(2) Power Supply

The power supply must:

1. Be vertically mountable on a 19-inch standard rack rail using two machine screws and two wing nuts
2. Have provisions to attach the modem power cable securely without the need for modifying the modem power cable.

The power supply must meet the following requirements:

Power Cord	Standard 120 V(ac), 3 prong cord, at least 40 inches in length (may be added by you)
Type	Switching mode type
Power Rated	40 W minimum with no minimum load required
Operating Temperature Range	From -22 to +158 °F
Operating Humidity Range	From 5 to 95 percent non-condensing
Input Voltage	From 85 to 264 V(ac) or 120 to 370 V(dc)
Input Frequency	From 47 to 63 Hz
Inrush Current	Cold start, 25 A at 115 V
Output Voltage	12 V(dc), adjustable over a ±10 percent range
Overload Protection	From 105 to 150 percent in output pulsing mode
Over Voltage Protection	From 115 to 135 percent of output voltage
Setup, Rise, Hold Up Time	800 ms, 50 ms, 15 ms at 115 V(ac)
Withstand Voltage	I/P-0/P:3 kV, I/P-FG:1.5 kV, for 60 seconds
Working Temperature*	158 °F@30%
Safety Standards	UL 1012, UL 60950

Note: You may propose a substitute which meets the 158 degrees F environmental rating at a lower load percentage as long as the temperature rating is maintained at the maximum modem load and all other electrical specifications are met.

86-3.03B(3) Serial Communication Cable – Type D

Where the modem is designed to interface with a Department-furnished Model 170E controller, provide a communication cable known as the C2 cable.

The C2 cable must interface the Department-furnished Model 170E controller C2 connector and the GPRS modem, and include all conductors and connectors required for that purpose.

The GPRS modem connector must meet TIA-232 standard using a 9 pin Type D connector.

The Department-Furnished Model 170E controller end connector must comply with AMP 201360-2-ND or equivalent.

All pins in both connectors must be gold plated.

The cable must:

1. Have four No. 20 AWG conductors with (UL) Type CM shielded or AWM 2464 80C 300 Volts – C (UL) CMG
2. Be at least 3 feet long

The cable wiring must comply with the following:

1. AMP 201360-2-ND -L to DB9-P - 2
2. AMP 201360-2-ND -K to DB9-P - 3
3. AMP 201360-2-ND -N to DB9-P - 5
4. AMP 201360-2-ND -D to AMP 201360-2-ND - H
5. AMP 201360-2-ND -J to AMP 201360-2-ND – M

86-3.03B(4) Antenna

The antenna must:

1. Be the low profile disc type
2. Adhere to the cabinet using a factory installed double-sided waterproof acrylic foam adhesive

The coax cable must be:

1. At least 40 inches in length
2. Have a 50 Ω TNC connector on the modem end

The antenna must meet the following requirements:

VSWR (at resonant point)	2:1 or less
Frequency	From 1850 to 1990 MHz and From 824 to 894 MHz
Nominal Impedance	50 Ω
Gain	2 dB
Radiation Pattern	Omni-directional
Polarization	Vertical
Ground Plane Required	Yes, see note below

The antenna must have a reflective ground plane to function properly. The required ground plane must extend beyond the antenna at least 8 inches in all directions.

86-3.03C Installation

Install modem as shown on the plans and under the manufacturer's specifications. Adjust the modem per field conditions with the Engineers approval.

Add to section 86-3.04:

Cabinet must be Model 334L and consist of a housing (B), a mounting cage 1, and the following listed equipment. The equipment must comply with chapter 6 of TEES.

1. Service panel no. 1
2. Power distribution assembly no. 3
3. Input file (I file)
4. Controller and equipment shelves
5. Dual fan assembly with thermostatic control
6. Mechanical armature-type relays
7. Input panel

Before shipping to the job site, submit each 334L cabinet to METS for acceptance testing.

Notify the Engineer when each 334L cabinet is ready for functional testing. Functional testing will be conducted by the Department.

Each power distribution assembly must include the following equipment:

1. Two duplex NEMA 5-15R controller receptacle (rear mount)
2. One 30 A, 1-pole, 120 V(ac) main circuit breaker
3. Three 15 A, 1-pole, 120 V(ac) circuit breaker
4. One duplex GFCI NEMA 15 A, receptacle (front mount)

Furnish 3 shelves as shown. Each shelf must be attached to the tops of 2 supporting angles with 4 screws. Supporting angles must extend from the front to the back rails. The front of the shelf must abut the front member of the mounting cage. Arrange shelves as shown. The angles must be designed to support a minimum of 50 pounds each. The horizontal side of each angle must be a minimum of 3 inches. The angles must be vertically adjustable.

Furnish 3 terminal blocks as shown. Terminal blocks must comply with Chapter 6 of TEES, except the screw size must be 8-32.

Furnish a maintenance manual or a combined maintenance and operation manual for all controller units, auxiliary equipment, vehicle detector sensor units, control units, and amplifiers. Submit manual when the controllers are delivered for testing or, if ordered by the Engineer, before purchasing. The manual must include the following:

1. Specifications
2. Design characteristics
3. General operation theory
4. Function of all controls
5. Troubleshooting procedure (diagnostic routine)
6. Block circuit diagram
7. Geographical layout of components
8. Schematic diagrams
9. List of replaceable component parts with stock numbers

Add to section 86-5.01A(1):

Loop wire must be Type 2.

Loop detector lead-in cable must be Type B.

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

Add section 86-5.01E

86-5.01E Vehicle Sensor Node Replacement

86-5.01E(1) General

86-5.01E(1)(a) Summary

Section 86-5.01E includes specifications for removing and disposing existing vehicle sensor node(s) (VSN), installing and testing new VSN(s) in the roadway, and reconfiguring access points (AP) to suit the new VSN(s).

86-5.01E(2) Materials

86-5.01E(2)(a) General

Each component must be new and comply with the manufacturer's recommendations.

All equipment, cables and hardware must be part of an engineered system that is specifically designed by the manufacturer to fully inter-operate with all other system components.

Each Wireless Magnetometer Vehicle Detection Station (WMVDS) component must be manufactured by Sensys Networks, Inc., 2560 Ninth Street, Suite 211, Berkeley, CA 94709, telephone (510) 548-4620.

Arrangements have been made to ensure that you can procure the WMVDS components directly from the manufacturer. The price quoted by the manufacturer for each component is as follows, not including sales tax or shipping.

Component Description	Quantity	1-99
VSN240F Flush Mount Sensor		\$457
Epoxy (sealant)		\$68
VSN240-CS Clear Plastic Shell for Flush Mount Sensor		\$7.50
Disposal of VSN (excludes removal/shipping costs)		\$15

The above price is firm for orders placed on or before May 31, 2013 provided delivery is accepted within 90 days after the order is placed.

86-5.01E(2)(b) Functional Capabilities

The vehicle sensor node communications must be:

1. Wireless between the VSN and the AP
2. Wireless (Cellular) or hardwired communications link between the AP, and VSN must comply with the following:
 - 2.1. The wireless communications link must comply with FCC rules. The communication protocol used must be open, and must be freely available for use in the public domain. Provide a document that completely defines the unit's communication protocol (message structure organization, data packet length as well as information necessary to make use of such messages).
 - 2.2. The VSN and AP must be reconfigurable by a user over the wireless interface. Reconfiguration must avoid interference from other users of the communications band. Provide a minimum of 16 channels per location for this purpose.
 - 2.3. The link budget must be 93 dB or greater.

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

The 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 speeds, when more than one VSN is installed in a lane:
 - 3.1. Per vehicle, in units of miles per hour (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 \geq 80 mph; in units of vehicles
4. Vehicle Length, when more than one VSN is installed in a lane:
 - 4.1. Per vehicle, in units of 0.1 foot
 - 4.2. Distribution of vehicle lengths in a data collection interval; in bins of < 20.0 feet, 20.0-39.9 feet, 40.0-59.9 feet, and \geq 60.0 feet; in units of vehicles

The time interval for data collection must be user-selectable at a minimum of 30-second 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 VSNs.

The system 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.

86-5.01E(2)(c) Vehicle Sensor Node

Each vehicle sensor node (VSN) must consist of a magnetometer sensor, a microprocessor with firmware in non-volatile memory, a wireless transceiver, and a battery within a single housing.

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

Each VSN must be:

1. Individually addressable with a unique identifier.
2. Capable of transmitting to the AP.

3. 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

The housing must be fully encapsulated to provide a minimum of 8 years of operation over a temperature range of -35 to +165 degrees F. The housing must be capable of being installed in a cylindrical hole that is no larger than 4 inches in diameter and 3 inches high.

86-5.01E(2)(d) Sealant

The sealant for the installation of the wireless detector sensor units must be:

1. A two-component, 100-percent solids, polyurea based joint sealant, approved by the manufacturer of the wireless detector sensor.
2. A self-leveling joint sealant which will be applied at a minimum temperature of 32 degrees F.

The surface to be bonded must be free of debris, moisture, and anything else that will interfere with the sealant bond.

86-5.01E(3) Construction

86-5.01E(3)(a) Installation and Calibration

Do not proceed with the installation of any WMVDS component without approval.

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

Before installation, demonstrate that each installed WMVDS component will operate independently and does not interfere with WMVDS components at another site or other equipment in the vicinity.

Before installation, demonstrate that each VSN will be installed within range of its corresponding AP, using RP as needed. VSNs assigned to either an RP or AP must be located with a ± 60-degree horizontal cone, measured from perpendicular. The maximum distances between a VSN and the AP are:

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

Test all VSNs and demonstrate proper operation and communication between the VSN and the AP and RP (if necessary) prior to the installation.

Install each VSN in the roadway under manufacturer’s recommendations. 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 public traffic. Remove the residue from the pavement surface by vacuuming or other approved method before any residue flows off of the pavement surface. Backfill the cored pavement under manufacturer’s recommendations. Remove and dispose any excess epoxy from the roadway without the use of solvents.

Comply with section 86-2.04 for installing each mounting standard.

After installation of all components, reconfigure and demonstrate successful communications between each VSN, the RP (if necessary) and the AP.

Perform the following:

1. Installation must comply with the requirements of the manufacturer.
2. Verify the performance of each site and 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 materials at the conclusion of testing invalidates the test. The recorded medium serves as acceptance evidence and must not be used for calibration. Complete the calibration before testing and verification.
3. Provide software needed for the analysis.

86-5.01E(3)(b) Acceptance Testing

Notify the Engineer 15 working days before the location is ready for acceptance testing. Schedule acceptance testing to be conducted in the presence of the Engineer during a normal work day (M-F 8 a.m. to 4 p.m.). Satisfactorily demonstrate the operation of all VSN units. The Engineer will reject the VSN if the demonstration fails.

Provide:

1. Equipment, documentation, materials and special tools required for acceptance testing, maintenance and operation of the system
2. Software required to program, reconfigure and support the VSN components, installed in the appropriate equipment at the time of acceptance testing, and used for the acceptance test

Accuracy of the system must be verified by comparing the vehicle counts to recorded video image counts for the same period. Accuracy testing must be done at 5 percent of the locations as selected by the Engineer. Clearly-visible, recorded video images for at least one peak period must be provided for all lanes that the VSNs were installed in. The recorded video images showing the viewed detection scene, detector(s) operation, the vehicle traffic count, and 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. Provide a means for synchronizing the test start and test ending times or provide software that displays time stamped data along with the video images of the moving vehicles. Provide the original recording medium and documentation that supports the accuracy analysis and keep a copy of these materials.

1. The accuracy test must start at an authorized 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 must be used, if possible. The minimum analysis period must be 30 minutes when the recording includes congested traffic (vehicles traveling at less than 20 mph for 5 or more minutes in any lane). The minimum analysis period must be 45 minutes when the traffic flow exceeds 1500 vehicles per hour in any lane during the test period. The minimum analysis period must be 60 minutes when the flow is less than 1500 vehicles per hour in every lane. 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 WMVDS and manual counts are included in the performance criterion specified in these special provisions. Each real vehicle in the video must be identified as either detected correctly (DC), missed (M), or overcounted (OC).
2. Compare the WMVDS unit count to vehicle counts under traffic conditions of the prior paragraph. The data accuracy must be determined by the formula:
$$(100 \times \{1 - [\text{absolute value } (TC-WC)/TC]\})$$

where TC= Traffic Count derived from the media recording and WC = reported count over the same period of time.
3. Average overall accuracy must be greater than 95 percent across all lanes. Minimum accuracy for each time period shall 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 system does not meet the performance requirements, you will have 7 days to re-calibrate and re-test the unit and re-submit new test data. Following 3 failed attempts, replace the system with a new unit.

Repair, replacement, and retesting of the system components due to failure or rejection are at your expense.

Provide manufacturer's written warranty against defects in material and workmanship for a period of 24 months after acceptance. After final acceptance of the system, all replacement assemblies covered under warranty must be provided within 10 days after receipt of failed units at no cost to the State, except the cost of shipping. Provide all warranty documentation to the Engineer prior to installation. Deliver all replacement assemblies of the failed units must be delivered at Electrical Maintenance, 30 Rickard Street, San Francisco, California, 94134, (415) 330-6500.

Ensure that standard updates to the software are made available from the supplier without charge to the State during the warranty period.

86-5.01E(4) Payment

Not Used

Add section 86-7.03

86-7.03 Removing, Reinstalling or Salvaging Electrical Equipment

86-7.03(1) General

86-7.03(1)(a) Summary

Section 86-7.03 includes specifications for removing, reinstalling and salvaging of electrical equipment.

86-7.03(2) Construction

86-7.03(2)(a) Salvaging

Not Used

86-7.03(2)(b) Removing Vehicle Sensor Node (VSN)

Send removed VSNs to the manufacturer for disposal as specified in section 14-11.10.

Each VSN includes one built-in Lithium Thionyl Chloride (LTC) battery. Improper handling of LTC batteries may result in release of battery content, explosion, or fire. LTC Thionyl chloride is designated as an extremely hazardous waste under Title 22, Division 4.5, Chapter 11, Article 5, Appendix 10 of the California Code of Regulations.

Use removal method that will not damage sensor casing and built-in batteries and will not separate batteries from the unit.

If you inadvertently separate LTC battery from VSN and the battery is not damaged, send it to the VSN manufacturer for disposal as specified in section 14-11.10.

Do not short-circuit, crush, puncture or expose LTC batteries to excessive heat or water.

If you damage or mishandle LTC batteries, you will be the generator of and responsible for cleanup, management, and disposal of hazardous waste, and for associated costs.

Backfill the holes caused by VSN removal with material equivalent to the surrounding material.

86-7.03(2)(c) Reinstalling VSN

Reinstall VSN during stage construction where shown on the plans and as specified in section 86-7.02 and section 86-5.01E.

Damaged VSN must not be reused and must be sent to the manufacturer for disposal as specified in section 14-11.10. If in the opinion of the Engineer, you caused the damage, you are responsible for the replacement cost.

86-7.03(3) Payment

Not Used

AA

90 CONCRETE

Add to section 90-2.02B:

You may use rice hull ash as an SCM. Rice hull ash must comply with AASHTO M 321 and the chemical and physical requirements shown in the following tables:

Chemical property	Requirement (percent)
Silicon dioxide (SiO ₂) ^a	90 min
Loss on ignition	5.0 max
Total alkalies 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 PUBLISHED ON 06-20-12

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 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

06-20-12

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.

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

06-20-12

Add to section 1-1.07B:

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:

703 B ST

04-20-12

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:

06-20-12

provided

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

01-20-12

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

01-20-12

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

Add to section 2-1.33C:

01-20-12

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

Replace the paragraph in section 2-1.35 with:

01-20-12

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

AA

5 CONTROL OF WORK

06-20-12

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

06-20-12

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.

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

06-20-12

30

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

06-20-12

Performance of

06-20-12

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

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):

06-20-12

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 DBEs to you regarding the request

AA

7 LEGAL RELATIONS AND RESPONSIBILITY TO THE PUBLIC

09-16-11

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

9 PAYMENT

04-20-12

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

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 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

Replace the 2nd sentence of the 7th paragraph of section 19-3.03K:

01-20-12

Stop construction in unstable areas until remedial measures have been taken. Remedial measures must be submitted and authorized.

Add between the 8th and 9th paragraphs of section 19-3.03K:

01-20-12

When your excavation and installation methods result in a discontinuous wall along any soil nail row, the ends of the structurally completed wall section must extend beyond the ends of the next lower excavation lift by a distance equal to twice the lift height. Maintain temporary slopes at the ends of each wall section to ensure slope stability.

Replace the 9th paragraph of section 19-3.03K:

01-20-12

Do not excavate to the next underlying excavation lift until the following conditions have been attained for the portion of the soil nail or ground anchor wall in the current excavation lift:

1. Soil nails or ground anchors are installed and grouted.
2. Reinforced shotcrete facing is constructed.
3. Grout and shotcrete have cured for 72 hours.
4. Specified tests are complete for that portion of wall and the results are authorized.

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.)	California Test 367			
No. 4 grading		17.0	17.0	--
3/8" grading		15.0	15.0	--
1/2" grading		14.0	14.0	18.0–23.0 ^a
3/4" grading		13.0	13.0	18.0–23.0 ^a
Voids filled with asphalt (%)	California Test 367			Note c
No. 4 grading		65.0–75.0	65.0–75.0	
3/8" grading		65.0–75.0	65.0–75.0	
1/2" grading		65.0–75.0	65.0–75.0	
3/4" grading		65.0–75.0	65.0–75.0	
Dust proportion	California Test 367			Note c
No. 4 and 3/8" gradings		0.6–1.2	0.6–1.2	
1/2" and 3/4" gradings		0.6–1.2	0.6–1.2	
Stabilometer value (min.) ^b	California Test 366			
No. 4 and 3/8" gradings		30	30	--
1/2" and 3/4" gradings		37	35	23

^a Voids in mineral aggregate for RHMA-G must be within this range.

^b California Test 304, Part 2C.12.

^c Report this value in the JMF submittal.

Replace item 4 in the list in the 1st paragraph of section 39-1.03C with:

01-20-12

4. JMF renewal on a *Caltrans Job Mix Formula Renewal* form, if applicable

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.

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 "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.

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 the 15th paragraph of section 39-1.11 with:

01-20-12

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.

Replace the 17th paragraph of section 39-1.11 with:

01-20-12

Do not open new HMA pavement to public traffic until its mid-depth temperature is below 160 degrees F.

Replace "3 inches per 0.1-mile section" in the 5th paragraph of section 39-1.12C with:

01-20-12

2.5 inches per 0.1-mile section

Replace "6 inches per 0.1-mile section" in the 6th paragraph of section 39-1.12C with:

01-20-12

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:

04-20-12

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,f} No. 4 and 3/8" gradings 1/2" and 3/4" gradings	California Test 366	One per 4,000 tons or 2 per 5 business days, whichever is greater	30	30	--	--
			37	35	23	--
Air void content (%) ^{c,g}	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 ^h	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)	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 ^k 18.0–23.0 ^k	--
Dust proportion ^j 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	--
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, 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 California Test 304, Part 2C.12.

^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 For adjusting the plant controller at the HMA plant.

ⁱ 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.

^j Report only.

^k Voids in mineral aggregate for RHMA-G must be within this range.

Replace the 1st paragraph of section 39-2.03A with:

04-20-12

The Department samples for acceptance testing and tests for the quality characteristics shown in the following table:

HMA Acceptance—Standard Construction Process

Quality characteristic	Test method	HMA type						
		A	B	RHMA-G	OGFC			
Aggregate gradation^a	California Test 202	JMF ± tolerance ^c						
Sieve						3/4"	1/2"	3/8"
1/2"						X ^b		
3/8"							X	
No. 4								X
No. 8						X	X	X
No. 200	X	X	X					
Sand equivalent (min) ^d	California Test 217	47	42	47	--			
Asphalt binder content (%)	California Test 379 or 382	JMF±0.40	JMF±0.40	JMF ± 0.40	JMF ± 0.40			
HMA moisture content (% max)	California Test 226 or 370	1.0	1.0	1.0	1.0			
Field compaction (% max. theoretical density) ^{e, f}	California Test 375	91–97	91–97	91–97	--			
Stabilometer value (min) ^{d, g} No. 4 and 3/8" gradings 1/2" and 3/4" gradings	California Test 366	30	30	--	--			
		37	35	23	--			
Air void content (%) ^{d, h}	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	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			
Fine aggregate angularity (% min) ⁱ	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 (%) ^j 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) ^j No. 4 grading 3/8" grading	California Test 367	17.0	17.0	--	--			
		15.0	15.0	--	--			

1/2" grading		14.0	14.0	18.0–23.0 ^k	
3/4" grading		13.0	13.0	18.0–23.0 ^k	
Dust proportion ^j 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	--
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 California Test 304, Part 2C.12

^h 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.

ⁱ 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.

^j Report only.

^k Voids in mineral aggregate for RHMA-G must be within this range.

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:

04-20-12

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	JMF ± tolerance ^b	JMF ± tolerance ^b	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, d} No. 4 and 3/8" gradings 1/2" and 3/4" gradings	California Test 366	30 37	30 35	-- 23	-- --
Percent of crushed particles Coarse aggregate (% min) One fractured face Two fractured faces Fine aggregate (% min) (Passing no. 4 sieve and retained on no. 8 sieve.) One fractured face	California Test 205	90 75 70	25 -- 20	-- 90 70	90 75 90
Los Angeles Rattler (% max) Loss at 100 rev. Loss at 500 rev.	California Test 211	12 45	-- 50	12 40	12 40
Air void content (%) ^{c, e}	California Test 367	4 ± 2	4 ± 2	TV ± 2	--
Fine aggregate angularity (% min) ^f	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 (%) ^g 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) ^g 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 ^h 18.0–23.0 ^h	--
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	0.6-1.2 0.6–1.2	Report only	--
Smoothness	Section 39-1.12	12-foot straight-edge and	12-foot straight-edge and	12-foot straight-edge and	12-foot straight-edge and

		must-grind	must-grind	must-grind	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 California Test 304, Part 2C.12.

^e 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.

^f 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.

^g Report only.

^h Voids in mineral aggregate for RHMA-G must be within this range.

Replace "280 degrees F" in item 2 in the list in the 6th paragraph of section 39-3.04 with:

01-20-12

285 degrees F

Replace the 8th paragraph of section 39-4.02C with:

04-20-12

Comply with the values for the HMA quality characteristics and minimum random sampling and testing for quality control shown in the following table:

Minimum Quality Control—QC/QA Construction Process

Quality characteristic	Test method	Minimum sampling and testing frequency	HMA Type			Location of sampling	Maximum reporting time allowance
			A	B	RHMA-G		
Aggregate gradation ^a	California Test 202	1 per 750 tons	JMF ± tolerance ^b	JMF ± tolerance ^b	JMF ± tolerance ^b	California Test 125	24 hours
Asphalt binder content (%)	California Test 379 or 382		JMF±0.40	JMF±0.40	JMF ±0.40	Loose mix behind paver See California Test 125	
Field compaction (% max. theoretical density) ^{c,d}	QC plan		92–96	92–96	91–96	QC plan	
Aggregate moisture content at continuous mixing plants and RAP moisture content at continuous mixing plants and batch mixing plants ^e	California Test 226 or 370	2 per day during production	--	--	--	Stock-piles or cold feed belts	--
Sand equivalent (min) ^f	California Test 217	1 per 750 tons	47	42	47	California Test 125	24 hours
HMA moisture content (% max)	California Test 226 or 370	1 per 2,500 tons but not less than 1 per paving day	1.0	1.0	1.0	Loose Mix Behind Paver See California Test 125	24 hours
Stabilometer value (min) ^{f,g}	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,h}	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		90	25	--	California Test 125	48 hours
Fine aggregate (% min) (Passing no. 4 sieve and retained on no. 8 sieve.): One fractured face			75	--	90		
Los Angeles Rattler (% max): Loss at 100 rev. Loss at 500 rev.	California Test 211	As designated in QC plan.	12	--	12	California Test 125	
Fine aggregate angularity (% min) ⁱ	California Test 234		45	50	40		
Flat and elongated particle (% max by weight @ 5:1)	California Test 235	At least once per project.	45	45	45	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	Report only	Report only	California Test 125	
Voids in mineral aggregate (% min.) ^j : 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		
			17.0 15.0 14.0 13.0	17.0 15.0 14.0 13.0	-- -- 18.0– 23.0 ^k 18.0– 23.0 ^k		

Dust proportion ^j :	California Test 367						
No. 4 and 3/8" gradings			0.6-1.2	0.6-1.2	Report only		
1/2" and 3/4" gradings			0.6-1.2	0.6-1.2			
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 California Test 304, Part 2C, 12.

^h 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.

ⁱ 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.

^j Report only.

^k Voids in mineral aggregate for RHMA-G must be within this range.

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:

04-20-12

The Engineer samples for acceptance testing and tests for the following quality characteristics:

HMA Acceptance—QC/QA Construction Process

Index (i)	Quality characteristic				Weighting 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, g} No. 4 and 3/8" gradings 1/2" and 3/4" gradings					California Test 366	30 37	30 35	-- 23
	Air void content (%) ^{f, n}					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) ^f					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 (%) ^j 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 ^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
	Smoothness		Section 39-1.12	12-foot straight- edge, must grind, and PI ₀	12-foot straight- edge, must grind, and PI ₀	12-foot straight- edge, must grind, and PI ₀
	Asphalt binder		Various	Section 92	Section 92	Section 92
	Asphalt rubber binder		Various	--	--	Section 92-1.01D(2) and section 39-1.02D
	Asphalt modifier		Various	--	--	Section 39-1.02D
	CRM		Various	--	--	Section 39-1.02D

^a The Engineer determines combined aggregate gradations containing RAP under California Test 367.

^b "X" denotes the sieves the Engineer tests for the specified aggregate gradation.

^c The tolerances must comply with the allowable tolerances in section 39-1.02E.

^d The Engineer determines field compaction for any of the following conditions:

1. 1/2-inch, 3/8-inch, or no. 4 aggregate grading is used and the specified total paved thickness is at least 0.15 foot and less than 0.20 foot.
2. 3/4-inch aggregate grading is used and the specified total paved thickness is at least 0.20 foot.

^e To determine field compaction, the Engineer uses:

1. California Test 308, Method A, to determine in-place density of each density core.
2. California Test 309 to determine the maximum theoretical density at the frequency specified in California Test 375, Part 5C.

^f The Engineer reports the average of 3 tests from a single split sample.

^g California Test 304, Part 2C.12.

^h 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.

ⁱ 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.

^j Report only.

^k Voids in mineral aggregate for RHMA-G must be within this range.

Replace the 3rd paragraph of section 39-4.04A with:

01-20-12

The Department determines the percent of maximum theoretical density from density cores taken from the final layer measured the full depth of the total paved HMA thickness if any of the following applies:

1. 1/2-inch, 3/8-inch, or no. 4 aggregate grading is used and the specified total paved thickness is at least 0.15 foot and any layer is less than 0.15 foot.
2. 3/4-inch aggregate grading is used and the specified total paved thickness is at least 0.20 and any layer is less than 0.20 foot.

AA

40 CONCRETE PAVEMENT

01-20-12

Replace section 40-1.01C(4) with:

01-20-12

40-1.01C(4) Authorized Laboratory

Submit for authorization the name of the laboratory you propose to use for testing the drilled core specimens for air content.

Replace the paragraph in section 40-1.01C(8) with:

01-20-12

Submit a plan for protecting concrete pavement during the initial 72 hours after paving when the forecasted minimum ambient temperature is below 40 degrees F.

Delete "determined under California Test 559" in section 40-1.01C(9).

01-20-12

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 SO₄
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 last 2 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
- 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:

The maximum distance below the depth shown must be 5/8 inch.

01-20-12

Replace sections 40-1.03L and 40-1.03M with:

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:

- Use self-propelled machine floats.

01-20-12

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

DIVISION VI STRUCTURES
46 GROUND ANCHORS AND SOIL NAILS

04-20-12

Add to section 46-1.03B:

Dispose of drill cuttings under section 19-2.03B. 04-20-12

Replace the 1st sentence of the 3rd paragraph of section 46-2.01A with:

Ground anchors must comply with section 50. 04-20-12

Add to section 46-2.02B:

Strand tendons, bar tendons, bar couplers, and anchorage assemblies must comply with section 50. 04-20-12

AA

47 EARTH RETAINING SYSTEMS

02-17-12

Replace the 2nd paragraph of section 47-2.01D with:

Coupler test samples must comply with minimum tensile specifications for steel wire in ASTM A 82/A 82M. Total wire slip must be at most 3/16 inch when tested under the specifications for tension testing of round wire test samples in ASTM A 370. 02-17-12

Replace the value for the sand equivalent requirement in the table titled "Property Requirements" in the 3rd paragraph of section 47-2.02C with:

12 minimum 01-20-12

Replace the 1st paragraph of section 47-2.02E with:

Steel wire must comply with ASTM A 82/A 82M. Welded wire reinforcement must comply with ASTM A 185/A 185M. 02-17-12

AA

48 TEMPORARY STRUCTURES

09-16-11

Replace the 7th paragraph of section 48-2.01C(2) with:

If you submit multiple submittals at the same time or additional submittals before review of a previous submittal is complete: 09-16-11

- 1. You must designate a review sequence for submittals

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:
 - 2.1. Aggregate must consist of at least 70 percent fine aggregate and approximately 30 percent pea gravel, by weight.
 - 2.2. Fine aggregate must comply with section 90-1.02C(3).
 - 2.3. Size of pea gravel must be such that 100 percent passes the 1/2-inch sieve, at least 90 percent passes the 3/8-inch sieve, and not more than 5 percent passes the no. 8 sieve.
3. California Test 541 is not required.
4. Grout is not required to pass through a sieve with a 0.07-inch maximum clear opening before being introduced into the grout pump.

Replace section 49-3.02B(8) with:

01-20-12

49-3.02B(8) Spacers

Spacers must comply with section 52-1.03D, except you may use plastic spacers.

Plastic spacers must:

1. Comply with sections 3.4 and 3.5 of the Concrete Reinforcing Steel Institute's *Manual of Standard Practice*
2. Have at least 25 percent of their gross plane area perforated to compensate for the difference in the coefficient of thermal expansion between the plastic and concrete
3. Be of commercial quality

Add to section 49-3.02C(4):

01-20-12

Unless otherwise shown, the bar reinforcing steel cage must have at least 3 inches of clear cover measured from the outside of the cage to the sides of the hole or casing.

Place spacers at least 5 inches clear from any inspection tubes.

Place plastic spacers around the circumference of the cage and at intervals along the length of the cage, as recommended by the manufacturer.

AA

50 PRESTRESSING CONCRETE

04-20-12

Replace "diameter" in item 9 in the list in the 1st paragraph of section 50-1.02D with:

04-20-12

cross-sectional area

Add to section 50-1.02:

09-16-11

50-1.02G Sheathing

Sheathing for debonding prestressing strand must:

1. Be split or un-split flexible polymer plastic tubing
2. Have a minimum wall thickness of 0.025 inch
3. Have an inside diameter exceeding the maximum outside diameter of the strand by 0.025 to 0.14 inch

Split sheathing must overlap at least 3/8 inch.

Waterproofing tape used to seal the ends of the sheathing must be flexible adhesive tape.

The sheathing and waterproof tape must not react with the concrete, coating, or steel.

Add to section 50-1.03B(1):

01-20-12

After seating, the maximum tensile stress in the prestressing steel must not exceed 75 percent of the minimum ultimate tensile strength shown.

Add to section 50-1.03B(2):

09-16-11

50-1.03B(2)(e) Debonding Prestressing Strands

Where shown, debond prestressing strands by encasing the strands in plastic sheathing along the entire length shown and sealing the ends of the sheathing with waterproof tape.

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.

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 the 2nd paragraph of section 51-2.02E(1)(e) with:

08-05-11

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.

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 the 3rd paragraph of section 51-4.02B(2) with:

04-20-12

For segmental or spliced-girder construction, materials for construction joints or closure joints at exterior girders must match the color and texture of the adjoining concrete.

Add to section 51-4.02B(2):

04-20-12

At spliced-girder closure joints:

- 1. If shear keys are not shown, the vertical surfaces of the girder segment ends must be given a coarse texture as specified for the top surface of PC members.
- 2. Post-tensioning ducts must extend out of the vertical surface of the girder segment closure end sufficiently to facilitate splicing of the duct.

For spliced girders, pretension strand extending from the closure end of the girder segment to be embedded in the closure joint must be free of mortar, oil, dirt, excessive mill scale and scabby rust, and other coatings that would destroy or reduce the bond.

Add to section 51-4.03B:

04-20-12

The specifications for prestressing force distribution and sequencing of stressing in the post-tensioning activity in 50-1.03B(2)(a) do not apply if post-tensioning of spliced girders before starting deck construction is described. The composite deck-girder structure must be post-tensioned in a subsequent stage.

Temporary spliced-girder supports must comply with the specifications for falsework in section 48-2.

Before post-tensioning of spliced girders, remove the forms at CIP concrete closures and intermediate diaphragms to allow inspection for concrete consolidation.

AA

52 REINFORCEMENT

04-20-12

Add to the list in the 3rd paragraph of section 52-1.02B:

04-20-12

- 9. Shear reinforcement stirrups in PC girders

Replace section 52-6.02D with:

10-21-11

52-6.02D Ultimate Butt Splice Requirements

When tested under California Test 670, ultimate butt splice test samples must demonstrate necking as either of the following:

- 1. For "Necking (Option I)," the test sample must rupture in the reinforcing bar outside of the affected zone and show visible necking.

86 ELECTRICAL SYSTEMS

01-20-12

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

Replace the 3rd paragraph of section 90-3.01C(5) with:

08-05-11

Production data must be input by hand into a pre-printed form or captured and printed by the proportioning device. Present electronic media containing recorded production data in a tab-delimited format on a CD or DVD. Each capture of production data must be followed by a line feed carriage return with sufficient fields for the specified data.

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92 ASPHALTS

01-20-12

Replace the row for dynamic shear for original binder in the table in the 1st paragraph of section 92-1.02B with:

01-20-12

Dynamic shear, Test temperature at 10 rad/s, °C	T 315	58	64	64	64	70
min G*/sin(delta), kPa		1.00	1.00	1.00	1.00	1.00
max G*/sin(delta), kPa		2.00	2.00	2.00	2.00	2.00